

Appendix 63

Whale Tail - 2018 Water Quality Monitoring for Dike Construction and Dewatering Report



MEADOWBANK GOLD PROJECT

**2018 Water Quality Monitoring for Dike Construction
and Dewatering Report**

In Accordance with NIRB Project Certificate No.008
and
NWB Type A Water License 2AM-WTP1826

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EXECUTIVE SUMMARY

Construction of two dewatering dikes (Whale Tail Dike and Mammoth Dike) is required as a component of the Whale Tail Pit project. The Water Quality Monitoring and Management Plan for Dike Construction and Dewatering (January, 2017) was developed to provide details of water quality monitoring and management actions for dike construction and dewatering activities. TSS (Total Suspended Solids) and turbidity (primarily as a surrogate for TSS) are the major drivers of management actions during construction and dewatering.

In 2018, construction of the Whale Tail Dike began. Neither construction of the Mammoth Dike nor dewatering activities occurred in 2018.

The objective of this report is to:

- describe the implementation of mitigation measures that were planned in conjunction with dike construction to control the release of total suspended solids (TSS) in the environment and thereby avoid and mitigate serious harm to fish and fish habitat;
- describe results of water quality monitoring that was conducted in accordance with the Plan;
- describe any supplemental management actions that were implemented based on monitoring results.

In-water construction of the Whale Tail Dike occurred from July 27 – August 27, 2018. Prior to dike construction, three turbidity curtains were installed on the south side of the dike. As a supplementary measure to protect fish remaining in the Whale Tail North Basin during the fishout, two turbidity curtains were also deployed prior to the start of the construction on the north side of the dike. Southern turbidity curtains were removed in September, after in-water construction was complete. A full list of mitigation measures to control release of TSS are described in Section 2.1.1 of this report.

Results of water quality monitoring during dike construction are compared to NWB Type A Water License criteria for TSS/turbidity. Monitoring occurred in four locations; north and south of turbidity curtains, as well as broad survey locations in Whale Tail Lake (South Basin) and Mammoth Lake. Four separate turbidity depth profiles were recorded using a handheld meter at each location, and turbidity values were converted to TSS using a site-specific, DFO-approved regression equation.

All monitoring results for all stations were within NWB Water License criteria, so no supplemental management actions were required to be implemented.

For routine water quality analysis at dike monitoring stations, some exceedances of CCME guidelines occurred, which is similar to construction of the Bay-Goose and East Dikes. Most exceedances occurred on the north side of Whale Tail Dike, in the ultimately impounded area of Whale Tail Lake - North Basin. The 2018 CREMP report provides a complete analysis of water quality monitoring results for the receiving environment, and no adverse effects were identified through that monitoring program.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	II
SECTION 1 • INTRODUCTION	1
SECTION 2 • STANDARDS FOR THE PROTECTION OF FISH AND FISH HABITAT	1
2.1 TSS Management Plan	1
2.1.1 Maximum Allowable TSS Concentrations and Trigger Values	3
2.2 Monitoring Methods	3
2.2.1 Monitoring Methods	3
2.2.1.1 TSS/Turbidity.....	3
2.2.1.2 Routine Water Quality	4
2.2.1.3 Discharge Monitoring.....	5
2.2.1.4 QA/QC Methods	5
2.2.2 Monitoring Locations.....	5
2.2.2.1 WT-DC-1, 2, 3, 4	5
2.2.2.2 WTN-DC-1,2,3,4.....	6
2.2.2.3 Broad Survey Locations (WTS-BS-1, 2, 3, 4 & MAM-BS-1, 2, 3, 4).....	6
2.2.2.4 Discharge Monitoring Locations	6
SECTION 3 • 2018 MONITORING RESULTS	8
3.1 TSS/Turbidity.....	8
3.1.1 WT-DC-1, 2, 3, 4	8
3.1.2 WTN-DC-1, 2, 3, 4	8
3.1.3 Broad Survey Locations.....	9
3.2 Routine Water Quality	10
3.2.1 QA/QC.....	11
3.3 Discharge Monitoring.....	12
SECTION 4 • CONCLUSION	12
REFERENCES	12

APPENDICES

- Appendix A:** Photos of Dike Construction and TSS Management Activities
- Appendix B:** TSS/Turbidity Monitoring Results
- Appendix C:** Routine Water Quality Monitoring Results
- Appendix D:** MDMER Monitoring Results for Construction Dewatering Discharge

LIST OF TABLES

Table 1. Mitigation measures to control release of TSS during construction of dewatering dikes, as described in the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering, Section 4.1 (January, 2017).....	2
Table 2. Maximum allowable TSS concentrations during dike construction (Meadowbank Mine Type A 2AM WTP1826 Part D Item 6). *Reference number for use in the text of this document.	3
Table 3. UTM coordinates of Whale Tail dike construction monitoring stations in 2018 (NAD 83).	8

LIST OF FIGURES

Figure 1. Monitoring locations for dike construction in 2018.	7
Figure 2. Daily maximum estimated concentration of TSS as measured through turbidity monitoring during Whale Tail Dike construction in 2018. Dashed line represented the NWB Type A Water License criterion for the maximum 30-d mean (15 mg/L). Dotted line indicates the maximum laboratory-measured baseline concentration of TSS for Whale Tail Lake (1 mg/L).....	10

SECTION 1 • INTRODUCTION

In 2018, Agnico Eagle Mines Ltd. (Agnico) was issued NIRB Project Certificate No. 008 and NWB Type A Water License 2AM-WTP1826 for development of the Whale Tail site, a satellite deposit at the Meadowbank Mine. Construction of two dewatering dikes (Whale Tail Dikey and Mammoth Dikey) is required as a component of the Whale Tail Pit project. The Water Quality Monitoring and Management Plan for Dikey Construction and Dewatering (January, 2017; the Plan) was developed to provide details of water quality monitoring and management actions for dikey construction and dewatering activities at Whale Tail Pit. Water quality monitoring includes several parameters (e.g., nutrients and metals), but TSS (Total Suspended Sediments) and turbidity (primarily as a surrogate for TSS) are the major drivers of management actions during construction and dewatering.

On July 27 2018, construction of the Whale Tail Dikey began. The objective of this report is to describe results of water quality monitoring that was conducted in accordance with the Plan, and the implementation of any mitigation measures that were required to control the release of total suspended solids (TSS) in the environment. Results are compared to NWB Water License criteria as presented in the Plan for TSS/turbidity.

Dewatering for dikey construction occurred from July 27 – August 27, 2018. Effluent discharge was monitored under MDMER requirements during this time, and results are summarized in this report.

No construction activities occurred for the Mammoth Dikey in 2018, and no dewatering of Whale Tail Lake (North Basin) occurred.

SECTION 2 • STANDARDS FOR THE PROTECTION OF FISH AND FISH HABITAT

2.1 TSS MANAGEMENT PLAN

During dikey construction, both the dikey material itself as well as the disturbed material on the lake floor (particularly in the deep areas of the lakes) will contribute to increases in concentrations of suspended sediments in the water column. In the absence of sediment control measures, suspended sediment plumes would be expected to migrate to the southeast with wind-driven (prevailing winds from the northwest) currents. The key means for minimizing suspended sediment discharges from the dikey construction zones during dikey construction include the deployment of turbidity curtains and water treatment.

In 2018, in-water Whale Tail Dikey construction occurred from July 27 – August 27. Prior to dikey construction, three turbidity curtains were installed on the south side of the dikey. As a supplementary measure to protect fish remaining in the Whale Tail North Basin during the fishout, two turbidity curtains were also deployed prior to the start of the construction on the north side of the dikey. Southern turbidity curtains were removed in September, after in-water construction was complete. A series of photos of dikey construction and TSS mitigation measures is provided in Appendix A.

Mitigation plans to control TSS release during dikey construction as planned in the 2017 Water Quality Monitoring and Management Plan for Dikey Construction and Dewatering are described in Table 1, along with a commentary on implementation in 2018.

Table 1. Mitigation measures to control release of TSS during construction of dewatering dikes, as described in the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering, Section 4.1 (January, 2017).

Planned Mitigation Measure	2018 Response
Deploy one length of turbidity curtains downstream of the dike and ensure curtains are situated in appropriate locations to minimize escape of sediments below the curtains.	Completed – three sets of turbidity curtains were deployed downstream of the dike.
Minimize water current out of the construction area to reduce potential for outflow of turbid water; this will be done by 1), if permits are received, slow-pace winter construction of a causeway about 25 m wide (the downstream portion of the dike), and 2) open-water installation of pumps in front of the rock platform deposition creating a no-current to inward-current zone inside the curtains. This should create an average negative pressure and will cause ‘clean’ water to move through the causeway into the trench, that will be backfilled with gravel to form the cutoff wall.	Completed (open water construction occurred) - water was pumped during causeway construction, and treated for TSS prior to discharge to Whale Tail North Basin
Provide a wind-breaker to protect turbidity curtains against the effects of high winds; this will be achieved by winter construction of the causeway or by rapidly advancing the platform immediately once the lake is open water. Since the causeway is the downstream portion of the dike, it will be the same height as the dike. The concept of the causeway was developed based on observations from the 2009 wind storm event that the integrity of the inner curtain portion closer to the rock platform was not affected by wind activity.	Wind breaker was not needed. Curtains were inspected daily and adjusted if needed.
Following the construction of the causeway, install curtains that have a reduced height and length to make them less prone to breakage from wind action; this will be achieved by 1) installation of the inner turbidity curtains in small cell-like patterns along the causeway to prevent wholesale breakage of the curtain due to effect of high winds, and 2) installation of outer curtains, as much as possible, in depths of no more than 10 m to reduce the effects of high winds.	Curtains were installed prior to work and inspected as above.
Reduction of the TSS loading inside the turbidity curtains; this is achieved by 1) the above mentioned pumping of water in front of the rock platform construction, and 2) pumping of water from the trench (the water with the highest TSS concentrations), both to be treated at the dewatering water treatment plant.	Completed - pumping and treating of water during causeway construction was conducted as described above.

2.1.1 Maximum Allowable TSS Concentrations and Trigger Values

In accordance with the Plan, during dike construction activities for the Project, maximum monthly mean (MMM) and short term maximum (STM) TSS concentrations are required to be met in accordance with the NWB Type A Water Licence (Table 2).

Management actions are associated with trigger values based on the MMM and STM. Should TSS concentrations in the water body exceed the trigger values during either dike construction or dewatering, a management action plan is initiated. For summer construction (i.e. when a turbidity curtain is installed), management actions are triggered if any single sample for any sampling station exceeds the STM in Table 2. For winter construction (i.e. no turbidity curtain), management actions are initiated when a single sample exceeds ½ the STM. Additional management actions are initiated if the 24-h average for any single station exceeds the STM, or if the 7-d moving average for any station exceeds the MMM.

Full management action plans are described in Section 4.3 and Figures 2 and 3 of the Plan.

Table 2. Maximum allowable TSS concentrations during dike construction (Meadowbank Mine Type A 2AM WTP1826 Part D Item 6). *Reference number for use in the text of this document.

Reference Number*	Parameter	Maximum Monthly Mean (mg/L)	Short Term Maximum (mg/L)
Criteria 1	TSS in areas where there is spawning habitat and at times when eggs or larvae are expected to be present	6	25
Criteria 2	TSS in all other areas and at times when eggs/larvae are not present	15	50
Criteria 3	TSS in impounded areas (e.g. North Basin of Whale Tail Lake) at all times in all areas	15	50

For reference, baseline concentrations of TSS measured in Whale Tail Lake in 2014 & 2015 (Azimuth, 2016) were at or below detection limits (1.0 mg/L). CCME Water Quality Guidelines for the Protection of Aquatic Life are +5 mg/L above background (long term, or 24h – 30 d) and +25 mg/L above background (short term, <24 h). A trigger value for TSS in the Core Receiving Environment Monitoring Program (CREMP) has not yet been developed for the Whale Tail Site, but the trigger value for the Meadowbank site is 3.0 mg/L.

2.2 MONITORING METHODS

2.2.1 Monitoring Methods

2.2.1.1 TSS/Turbidity

Water quality monitoring for dike construction includes several parameters (e.g., nutrients and metals), but TSS and turbidity (primarily as a surrogate for TSS) are the major drivers of management actions during construction. The TSS/turbidity focus allows for direct monitoring of the major potential stressor, thus allowing timely identification and mitigation of potential issues.

Based on experience at the Meadowbank Mine, this is not possible using TSS as a direct measure, because of the time required to analyze TSS in the field. Consequently, and consistent with the recommendations of the DFO (DFO, 2000), Agnico Eagle has developed a relationship between turbidity and TSS, allowing the use of turbidity as a surrogate for TSS and obtaining real time results.

The TSS-turbidity relationship was developed using paired data collected across a range of TSS sources and concentrations and previously approved in the, Whale Tail Pit - Water Quality Monitoring and Management Plan for Dike Construction and Dewatering (January 2017). The resulting linear regression was as follows:

$$\log_{10}(\text{turbidity}) = 0.62196 + (0.95619 * \log_{10}(\text{TSS})) \text{ [}p < 0.001; r^2\text{-adj} = 0.81\text{]}$$

where turbidity is measured in NTUs in the field using an Analite NEP 160 meter, and TSS is measured in the lab as mg/L.

Turbidity assessments for dike construction monitoring locations will be performed using a handheld turbidity meter, and converted to TSS using the above regression equation. Turbidity readings are recorded for a depth profile at 2 m intervals.

Raw turbidity data was handled in the following manner to facilitate comparisons to the maximum allowable TSS concentrations:

Comparisons to Short-Term Maximum (STM)

1. Calculate the 24-hr station mean for turbidity for each station based on the measured maximum values over the past 24 hours.
2. Use the TSS-turbidity regression (using the site-specific TSS:Turbidity) to estimate 24-hr mean TSS.
3. Calculate the moving average of each station.
4. Compare to appropriate STM value.

Example: Maximum turbidity values of 2.4, 3.0 and 1.2 NTUs were measured in depth profiles at Station Y over the last 24 hours, for a 24-hr mean of 2.2 NTU. Using the TSS:Turbidity relationship, the 24-hr mean TSS concentration would be 6.6 mg/L.

Comparisons to Maximum Monthly Mean (MMM)

1. Calculate the 30-day moving average of each stations (24-hr mean TSS values) for the previous 30 days.
2. Compare this to the appropriate MMM value.

2.2.1.2 Routine Water Quality

Samples at a depth of 3 meters using a clean diaphragm pump for routine water quality analysis were collected weekly (if possible) on the north and south sides of the dike construction zone in Whale Tail Lake (WT-DC and WTN-DC locations; Section 2.2.2.1) to characterize conditions in the receiving environment. Analysis included:

- Physical parameters: hardness, pH, total dissolved solids, total suspended solids;
- Anions and nutrients: ammonia, alkalinity – bicarbonate, alkalinity – carbonate, alkalinity – hydroxide, alkalinity – total; chloride, silicate, sulfate, nitrate, nitrite, total kjeldahl nitrogen, orthophosphate, total phosphate;
- Organic parameters: chlorophyll a, dissolved organic carbon, total organic carbon;

- Total and dissolved metals

H2Lab (Val d'Or) provided all of the sampling containers and appropriate preservatives for the water and filter samples. All samples were stored in the dark and kept on ice immediately following collection and during transport to the laboratory. A completed chain-of-custody form accompanied the samples during transport.

Results of the complete water quality analysis are compared to CCME Water Quality Guidelines for the Protection of Aquatic Life, where available. These guidelines are intended to provide a conservative level of protection to freshwater aquatic life from anthropogenic contaminants or other physical changes (suspended solids, temperature).

2.2.1.3 Discharge Monitoring

Following MDMER requirements, effluent created from construction dewatering was sampled for TSS prior to discharge to the receiving environment. Samples were collected from the designated sampling point (see 2.2.2) using laboratory-supplied containers. All samples were stored in the dark and kept on ice immediately following collection and during transport to the laboratory. A completed chain-of-custody form accompanied the samples during transport.

2.2.1.4 QA/QC Methods

The objective of QA/QC is to assure that data collected are representative of the media being sampled, are of known quality, are properly documented, and are scientifically defensible. Data quality was assured throughout the collection and analysis of samples by using standardized procedures, by the employment of laboratories that have been certified for all applicable methods, and by staffing the program with experienced technicians.

Field-level QA procedures are described below.

Turbidity Monitoring – Field QA included consistently adhering to the monitoring program and using properly maintained and calibrated instruments.

Water Sampling – Throughout routine water quality sampling, field QA standards, as documented in Agnico Eagle's QA/QC Plan (Version 4, March, 2019) were maintained. This included thoroughly flushing the flexible tubing and pump to prevent cross-contamination between stations and rinsing the sample containers with site water prior to sample collection. Field duplicates, equipment blanks and trip blanks were collected at a subset of stations.

The field duplicates were used to assess sampling variability and sample homogeneity; a Relative Percent Difference (RPD) of 50% for concentrations that exceed 10x the MDL is considered acceptable. The equation used to calculate RPD is:

$$RPD = (A - B) / ((A + B) / 2) \times 100$$

where: A = analytical result; B = duplicate result.

Trip blanks and field blanks were used to assess whether any trip-related or equipment-related cross contamination may have occurred.

2.2.2 Monitoring Locations

2.2.2.1 WT-DC-1, 2, 3, 4

For the purposes of compliance with NWB Type A Water License requirements (Table 2) and as described in the Plan, water quality monitoring for turbidity/TSS was conducted in four stations downstream (south) of the southern turbidity curtain set, as shown in Figure 1 (stations WT-DC-1,2,3,4). GPS coordinates are provided in Table 3. These stations were approximately 50 – 100 m south of the turbidity curtain. For these stations, turbidity depth profiles (2 m intervals) were measured daily during in-water dike construction and the open water season (July 27 – September 5). After this date and according to the Plan, turbidity monitoring occurred as weather and ice conditions permitted. In-water construction was complete on August 27.

Routine water quality monitoring sampling was also conducted weekly at each of these stations.

2.2.2.2 WTN-DC-1,2,3,4

Supplemental monitoring for turbidity/TSS was conducted immediately north of the northern turbidity curtains, in Whale Tail Lake (North Basin) (Figure 1). GPS coordinates are provided in Table 3. Depth profiles were recorded for these stations at least weekly during the open water season, and as weather and ice conditions permitted following ice-up. Measured turbidity/TSS values for this location can be used to understand any potential stressors for fish remaining in this basin prior to the fishout, which began August 13 and was terminated September 27 due to ice-up.

2.2.2.3 Broad Survey Locations (WTS-BS-1, 2, 3, 4 & MAM-BS-1, 2, 3, 4)

Supplemental monitoring for turbidity/TSS was conducted at open-lake locations both up- and downstream of the construction zone, in Whale Tail Lake (South Basin) and Mammoth Lake (Figure 1). GPS coordinates are provided in Table 3. Depth profiles for these stations were recorded weekly during the open water season. Results of monitoring at these stations will provide an indication of how far any sediment plumes may have travelled in the event of an exceedance of NWB Type A Water License requirements at WT-DC stations.

2.2.2.4 Discharge Monitoring Locations

The final discharge point to Whale Tail North Basin (ST-MDMER-4) was in operation between July 27th to August 10th and between August 14th to August 27th. The sample was taken from the Water Treatment Plant, after which treated effluent was released on the tundra, and flowed into a natural boulder field at the edge of the Whale Tail Lake North Basin (receiving environment).

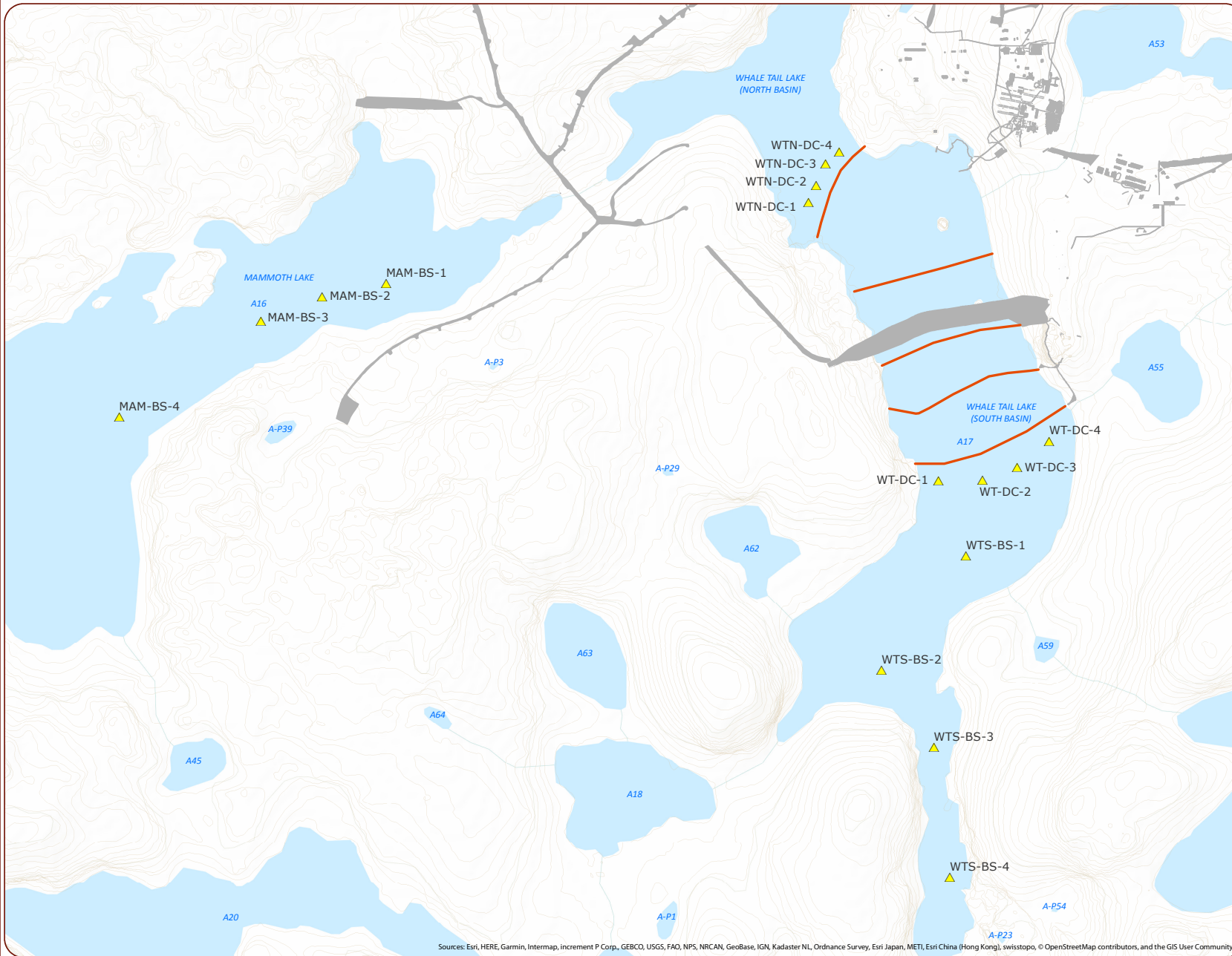



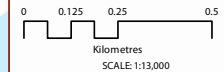


Figure 1: Monitoring Locations for Dike Construction

Legend

-  Turbidity Monitoring Stations
-  Turbidity Curtains
-  Infrastructure



AGNICO EAGLE

Disclaimer:
The information displayed on this map has been compiled from various sources. While every effort has been made to accurately depict the information, this map should not be relied on as being a precise indicator of locations, features, or roads, nor as a guide to navigation.

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Table 3. UTM coordinates of Whale Tail dike construction monitoring stations in 2018 (NAD 83).

Location	Station ID	UTM
Downstream of turbidity curtains	WT-DC-1	14 W 607408 7254176
	WT-DC-2	14 W 607565 7254178
	WT-DC-3	14 W 607690 7254225
	WT-DC-4	14 W 607804 7254317
Upstream of turbidity curtains	WTN-DC-1	14 W 606942 7255172
	WTN-DC-2	14 W 606970 7255233
	WTN-DC-3	14 W 607004 7255311
	WTN-DC-4	14 W 607052 7255352
Downstream broad survey location	WTS-BS-1	14 W 607506 7253906
	WTS-BS-2	14 W 607204 7253497
	WTS-BS-3	14 W 607391 7253223
	WTS-BS-4	14 W 607449 7252757
Upstream broad survey location	MAM-BS-1	14 W 605431 7254881
	MAM-BS-2	14 W 605203 7254833
	MAM-BS-3	14 W 604984 7254747
	MAM-BS-4	14 W 604476 7254405

SECTION 3 • 2018 MONITORING RESULTS

3.1 TSS/TURBIDITY

3.1.1 WT-DC-1, 2, 3, 4

Measured turbidity and calculated TSS values for WT-DC-1, 2, 3, 4 are provided in Appendix B, along with 24-h, 7-d and 30-d means for comparison to NWB Type A Water License criteria (shown in Table 2). Results are compared to Criteria 1 – “TSS in areas where there is spawning habitat and at times when eggs or larvae are expected to be present” since it is unknown whether spawning occurs in this area. Daily maximum concentrations of TSS for each station are shown in Figure 2.

No exceedances of the Water License criteria (Table 2, Criteria 1) occurred for any station, with a maximum recorded individual value of 3.29 mg/L.

All results were reported monthly to the NWB in the Whale Tail Project’s Monitoring Program Summary Report (July, August, September, October, November, December).

3.1.2 WTN-DC-1, 2, 3, 4

Measured turbidity and calculated TSS values for WTN-DC-1, 2, 3, 4 are provided in Appendix B. These values were not required to be reported monthly to NWB for compliance purposes, but a comparison to NWB Type A Water License criteria was conducted to understand any potential impacts on fish remaining in Whale Tail Lake (North Basin) prior to completion of the fishout. Results are compared to Criteria 3 – “TSS in impounded areas (e.g. North Basin of Whale Tail Lake) at all times in all areas”. Daily maximum concentrations of TSS for each station are shown in Figure 2.

No exceedances of the Water License criteria occurred for any station. No single recorded value exceeded the maximum monthly mean (15 mg/L), with a maximum recorded individual value of 13.66 mg/L.

3.1.3 Broad Survey Locations

Measured turbidity and calculated TSS values for Mammoth Lake monitoring locations (MAM-BS-1, 2, 3, 4) and Whale Tail Lake (South Basin) monitoring locations (WT-BS-1, 2, 3, 4) are provided in Appendix B. These values were not required to be reported monthly to NWB for compliance purposes, but a comparison to NWB Type A Water License criteria was conducted to understand TSS concentrations in these near-field receiving environments. Results are compared to Criteria 1 – “TSS in areas where there is spawning habitat and at times when eggs or larvae are expected to be present”, since these are the most conservative criteria and it is unknown whether spawning occurs in these area and baseline concentrations (up to 1.0 mg/L). Daily maximum concentrations of TSS for each station are shown in Figure 2.

No exceedances of the Water License criteria occurred for any station, and all results were within Meadowbank’s Core Receiving Environment Monitoring Program (CREMP) TSS trigger value of 3 mg/L. A trigger value has not yet been developed for the Whale Tail site. The maximum recorded value was 0.49 mg/L in Whale Tail Lake (South Basin) and 1.09 mg/L in Mammoth Lake, indicating that estimated TSS concentrations in these areas are below or very near measured baseline concentrations.

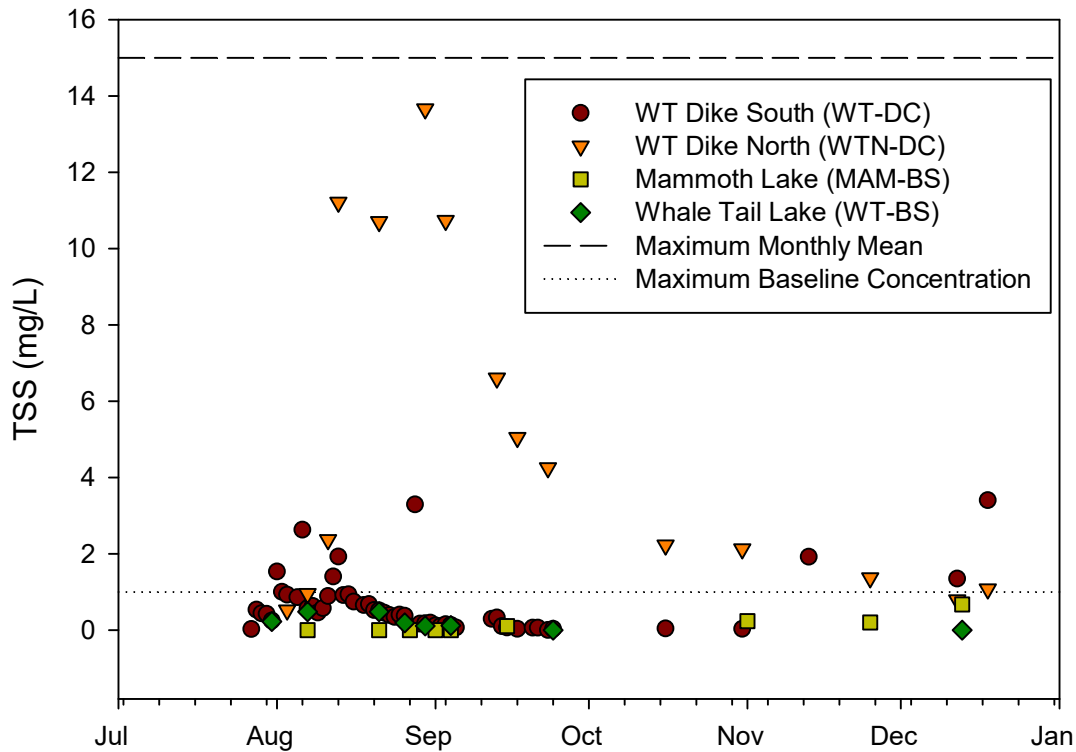


Figure 2. Daily maximum estimated concentration of TSS as measured through turbidity monitoring during Whale Tail Dike construction in 2018. Dashed line represented the NWB Type A Water License criterion for the maximum 30-d mean (15 mg/L). Dotted line indicates the maximum laboratory-measured baseline concentration of TSS for Whale Tail Lake (1 mg/L).

3.2 ROUTINE WATER QUALITY

Results of the weekly routine water quality monitoring conducted at WT-DC and WTN-DC are provided in Appendix C. Values are compared to CCME water quality guidelines where available for context, since no exceedances of Water License criteria related to dike construction occurred and CREMP trigger values have not yet been developed for the Whale Tail Lake area.

Results are discussed by parameter group.

TSS – Laboratory-measured concentrations of TSS were at or very near detection limits (1 mg/L) in all samples at WT-DC. The highest measured concentration was 2 mg/L. At WTN-DC, concentrations were measured up to 9 mg/L, and this one sample exceeded the CCME long-term guideline of 5 mg/L above background (i.e. 6 mg/L). No samples exceeded the CCME short-term guideline of 25 mg/L above background. Overall, laboratory-measured concentrations of TSS aligned with those predicted using the regression equation in Section 2.2.1 (Appendix B, Tables B-2 and B-4, Appendix C, Tables C-1 and C-2).

Anions and Nutrients – For both locations, ammonia was not detectable in any sample, and nitrate/nitrite were well below CCME guidelines. Total phosphorus exceeded CCME guidelines (using the guideline for ultra-oligotrophic lakes) in several samples for each location, but the laboratory detection limit was also above the guideline.

Organic Carbon – Dissolved and total results were very similar, with TOC results marginally exceeding DOC results. This suggests that that virtually all organic carbon is present in the dissolved form. There was no clear pattern in DOC or TOC concentrations in relation to TSS.

Total and Dissolved Metals – For total metals, one or more samples exceeded CCME guidelines for several parameters at each station. Parameters exceeding the guidelines for total metals were: iron, lead and selenium (WT-DC location) and aluminum, copper, chromium, iron, lead, selenium, thallium, and zinc (WTN-DC location). While no guidelines were available for any dissolved metal except aluminum, results of the dissolved metals analysis were compared to guidelines for total metals, as in the Bay-Goose Dike construction monitoring report (Azimuth, 2010). Dissolved metals only exceeded those guidelines for three samples: chromium was marginally above the guideline in one sample at WTN-DC, and selenium marginally exceeded the guideline twice in this location. This pattern of results is similar to those observed for the Bay-Goose Dike construction (Azimuth, 2010), and East Dike construction (Azimuth, 2009). Dissolved metals are considered a much better indicator of potential effects to aquatic life in the water column, and therefore as concluded in Azimuth (2010), these water quality results suggest that direct toxic effects to aquatic life are unlikely. The 2018 CREMP report provides a more complete analysis of water quality monitoring results for Whale Tail Lake. No CCME guideline values were exceeded in that monitoring program.

3.2.1 QA/QC

Field duplicate results for dike construction monitoring were generally consistent with the original samples (Appendix C, Tables C-3 & C-4). For samples in which both the parent and duplicate values exceeded 10x the method detection limit (MDL), all RPDs were less than 50% except one result for total alkalinity and one result for bicarbonate alkalinity at ST-WTN-DC. RPDs in both these cases were 60%. Detections above the MDL occurred for both trip blanks and field blanks for alkalinity (discussed below), potentially indicating difficulty in obtaining accurate measurements for this parameter group. A discussion will be initiated with the analytical laboratory to understand the potential for variability in alkalinity results, and how this can be minimized.

Results of trip and field blanks are also provided in Tables C-3 and C-4. Technically, no parameter measured in a trip for field blank should exceed detection. For field blanks, several exceedances of the MDL occurred (alkalinity, sulphate ammonia-N). However, all were marginal and suggest that no major sampling errors occurred. In nearly all cases, exceedances of MDLs in the associated trip blank also occurred, indicating there could have been an issue with the analysis rather than the sampling methods. Parameters for which trip blank detections occurred in any sample were: TSS, alkalinity, TKN, chlorophyll a, total iron, dissolved copper. While most were marginal exceedances, one trip blank measurement for ST-WTN-DC for TDS was 30x the detection limit. Since overall the water chemistry analysis did not indicate a likelihood of toxicity from any parameter, any potential sample contamination with dissolved material was not significant enough to affect overall interpretation of results. Nevertheless, a discussion will be initiated with the analytical laboratory to determine why this may have occurred.

3.3 DISCHARGE MONITORING

Results of effluent monitoring are provided along with MDMER criteria in Appendix D, Table D-1. No results exceeded criteria.

The volume of water discharged to the environment was reported on a weekly basis pursuant to the MDMER monitoring program requirements. The total volume discharged in 2018 was 321,537 m³.

SECTION 4 • CONCLUSION

Monitoring of TSS/turbidity during construction of the Whale Tail Dike in 2018 indicated that measures to avoid and mitigate serious harm to fish and fish habitat were successful, since all calculated concentrations of TSS were within NWB Water License criteria.

Calculated TSS concentrations at broad survey monitoring locations in Whale Tail Lake (South Basin) and Mammoth Lake were also below the CREMP trigger value for the Meadowbank site, and were below or very near baseline concentrations.

Results of the routine water quality analysis indicated low potential for direct toxicity to aquatic life. This conclusion is supported by the 2018 CREMP analysis.

All effluent discharge monitoring results met MDMER criteria.

No supplemental management actions were therefore required to be implemented.

Monitoring will continue in 2019 for Whale Tail and Mammoth Dike construction and dewatering, according to the 2017 Water Quality Monitoring and Management Plan for Dike Construction and Dewatering.

REFERENCES

Azimuth (Azimuth Consulting Group Partnership), 2016. Core Receiving Environment Monitoring Program (CREMP): 2014-2015 Baseline Studies. Prepared for Agnico Eagle Mines Ltd. January, 2016. In: Final Environmental Impact Statement for the Whale Tail Pit and Haul Road Project, Appendix 6-G. June, 2016.

Azimuth (Azimuth Consulting Group Partnership), 2010. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction Monitoring 2009, Meadowbank Gold Project, Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Vancouver BC. March 2010.

Azimuth (Azimuth Consulting Group Partnership), 2009. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction Monitoring, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Vancouver BC. March 2009.

APPENDIX A

Photos of Dike Construction and TSS Management Activities in 2018



Figure A- 1. Whale Tail dike construction, July 30, 2018.



Figure A- 2. Whale Tail dike construction, July 31, 2018 (looking west).



Figure A- 3. Whale Tail dike construction, August 26, 2018.



Figure A- 4. Whale Tail dike construction, 2018 (looking east).

APPENDIX B

TSS/Turbidity Monitoring Results

Table B-5. Measured turbidity values for dike construction monitoring stations ST-WT-BS-1, 2, 3, 4

Date	Station	Time	Turbidity Depth Profile (meters below surface; units: NTU)										Max 24H	Daily Max - all stations		
			0	1	2	3	4	5	6	7	8	9			10	
2018-07-31	ST-WT-BS1			0.950	0.800	0.780	0.960	0.840	1.010						1.0	1.0
	ST-WT-BS2			0.640	0.670	0.700	0.630	0.730	0.620	0.62					0.7	
	ST-WT-BS3			0.200	0.170	0.160	0.110	0.150	0.140						0.2	
	ST-WT-BS4			0.090	0.070	0.030	0.050	0.060	0.100						0.1	
2018-08-07	ST-WT-BS1	16:45		2.020	1.990	1.840	2.100	1.800	1.850						2.1	2.1
	ST-WT-BS2	17:00		1.800	1.990	1.850	1.810	1.890	1.830	1.87					2.0	
	ST-WT-BS3	17:15		0.520	0.640	0.490	0.670	0.520	0.530	0.47					0.7	
	ST-WT-BS4	17:30		0.000	0.000	0.000	0.000	0.000	0.000	0.000					0.0	
2018-08-21	ST-WT-BS1	14:30		2.100	2.000	2.010	2.040	2.050	2.040						2.1	2.1
	ST-WT-BS2			1.810	1.780	1.810	1.910	1.840	1.860						1.9	
	ST-WT-BS3			0.950	0.980	0.880	0.870	0.880	0.830	0.82					1.0	
	ST-WT-BS4			0.200	0.190	0.150	0.140	0.170	0.210						0.2	
2018-08-26	ST-WT-BS1	16:00		0.800	0.870	0.840	0.800	0.750							0.9	0.9
	ST-WT-BS2			0.790	0.690	0.710	0.750								0.8	
	ST-WT-BS3			0.100	0.130	0.120	0.110	0.001	0.050	0.060					0.1	
	ST-WT-BS4			0.000	0.000	0.000	0.000	0.000							0.0	
2018-08-30	ST-WT-BS1	9:00		0.420	0.500	0.450	0.470	0.510	0.500						0.5	0.5
	ST-WT-BS2			0.470	0.410	0.440	0.300	0.350	0.440	0.40					0.5	
	ST-WT-BS3			0.000	0.120	0.000	0.000	0.000	0.000	0.00	0.00	0.00			0.1	
	ST-WT-BS4			0.000	0.000	0.000	0.000	0.000	0.000		0.00				0.0	
2018-09-04	ST-WT-BS1	13:20		0.320	0.470	0.310	0.200	0.550	0.280						0.6	0.6
	ST-WT-BS2			0.200	0.200	0.220	0.280	0.190	0.250	0.230	0.3				0.3	
	ST-WT-BS3			0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00				0.0	
	ST-WT-BS4			0.000	0.000	0.000	0.000	0.000	0.000						0.0	
2018-09-24	ST-WT-BS1	10:35		0.000	0.000	0.000	0.000	0.000	0.000						0.0	0.0
	ST-WT-BS2			0.000	0.010	0.000	0.000	0.000	0.000	0.00	0.0				0.0	
	ST-WT-BS3			0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00				0.0	
	ST-WT-BS4			ICE on that part of LAKE											0.0	
2018-12-13	ST-WT-BS1	15:17		0.000	0.000	0.000	0.000	0.000	0.000						0.0	0.0
	ST-WT-BS2	15:04		0.000	0.000	0.000	0.000	0.000	0.000	0.00					0.0	
	ST-WT-BS3	14:52		0.000	0.000	0.000	0.000	0.000	0.000	0.00					0.0	
	ST-WT-BS4	14:37		0.000	0.000	0.000	0.000	0.000	0.000						0.0	

Table B-6. Calculated TSS concentrations for dike construction monitoring stations ST-WT-BS-1, 2, 3, 4

Date	Station	Time	Calculated TSS Profile (meters below surface; units mg/L)										Max day	Max 24H	Mean 24H	7-Day moving-AVG	30-day moving-AVG		
			0	1	2	3	4	5	6	7	8	9						10	
2018-07-31	ST-WT-BS1	0:00		0.212	0.177	0.172	0.214	0.186	0.226							0.226	0.198		
	ST-WT-BS2	0:00		0.140	0.147	0.154	0.138	0.161	0.136	0.136					0.226	0.161	0.145		
	ST-WT-BS3	0:00		0.042	0.035	0.033	0.022	0.031	0.029							0.042	0.032		
	ST-WT-BS4	0:00		0.018	0.014	0.006	0.010	0.012	0.020							0.020	0.013		
2018-08-07	ST-WT-BS1	16:45		0.467	0.459	0.423	0.486	0.414	0.426							0.486	0.446	0.322	0.322
	ST-WT-BS2	17:00		0.414	0.459	0.426	0.416	0.435	0.421	0.430					0.486	0.459	0.429	0.287	0.287
	ST-WT-BS3	17:15		0.113	0.140	0.106	0.147	0.113	0.115	0.102						0.147	0.119	0.076	0.076
	ST-WT-BS4	17:30		0.000	0.000	0.000	0.000	0.000	0.000	0.000					0.000	0.000	0.007	0.007	
2018-08-21	ST-WT-BS1	14:30		0.486	0.462	0.464	0.471	0.474	0.471							0.486	0.471	0.558	0.558
	ST-WT-BS2	0:00		0.416	0.409	0.416	0.440	0.423	0.428						0.486	0.440	0.422	0.498	0.498
	ST-WT-BS3	0:00			0.219	0.196	0.193	0.196	0.184	0.182						0.219	0.195	0.173	0.173
	ST-WT-BS4	0:00		0.042	0.039	0.031	0.029	0.035	0.044							0.044	0.037	0.025	0.025
2018-08-26	ST-WT-BS1	16:00		0.177	0.193	0.186	0.177	0.166								0.193	0.180	0.647	0.647
	ST-WT-BS2	0:00		0.175	0.152	0.156	0.166								0.193	0.175	0.162	0.579	0.579
	ST-WT-BS3	0:00		0.020	0.026	0.024	0.022	0.000	0.010	0.012						0.026	0.016	0.181	0.181
	ST-WT-BS4	0:00		0.000	0.000	0.000	0.000	0.000								0.000	0.000	0.025	0.025
2018-08-30	ST-WT-BS1	9:00		0.090	0.108	0.097	0.102	0.111	0.108							0.111	0.103	0.699	0.699
	ST-WT-BS2	0:00		0.102	0.088	0.095	0.063	0.075	0.095	0.086					0.111	0.102	0.086	0.622	0.622
	ST-WT-BS3	0:00		0.000	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000				0.024	0.003	0.183	0.183
	ST-WT-BS4	0:00		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				0.000	0.000	0.025	0.025
2018-09-04	ST-WT-BS1	13:20		0.068	0.102	0.066	0.042	0.120	0.059							0.120	0.076	0.737	0.737
	ST-WT-BS2	0:00		0.042	0.042	0.046	0.059	0.039	0.052	0.048	0.070				0.120	0.070	0.050	0.647	0.647
	ST-WT-BS3	0:00		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000					0.000	0.000	0.183	0.183
	ST-WT-BS4	0:00		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000					0.000	0.000	0.025	0.025
2018-09-24	ST-WT-BS1	10:35		0.000	0.000	0.000	0.000	0.000	0.000							0.000	0.000	0.737	0.737
	ST-WT-BS2	0:00		0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.002	0.002	0.000	0.647	0.647
	ST-WT-BS3	0:00		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.002	0.000	0.000	0.183	0.183
	ST-WT-BS4	0:00		ICE on that part of LAKE													0.025	0.025	
2018-12-13	ST-WT-BS1	15:17		0.000	0.000	0.000	0.000	0.000	0.000	0.000						0.000	0.000	0.638	0.737
	ST-WT-BS2	15:04		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			0.000	0.000	0.000	0.574	0.647
	ST-WT-BS3	14:52		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			0.000	0.000	0.000	0.167	0.183
	ST-WT-BS4	14:37		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				0.000	0.000	0.037	0.050

Table B-7. Measured turbidity values for dike construction monitoring stations ST-MAM-BS-1, 2, 3, 4

Date	Station	Time	Turbidity Depth Profile (meters below surface; units: NTU)										Max 24H	Daily Max - all stations		
			0	1	2	3	4	5	6	7	8	9			10	
2018-08-07	ST-MAM-BS1	14:15													0.0	0.0
	ST-MAM-BS2		0.000	0.000	0.000	0.000	0.000	0.000						0.0		
	ST-MAM-BS3		0.000	0.000	0.000	0.000	0.000	0.000						0.0		
	ST-MAM-BS4		0.000	0.000	0.000									0.0		
2018-08-21	ST-MAM-BS1	10:30													0.0	0.0
	ST-MAM-BS2		0.000	0.000	0.000	0.000	0.000	0.000						0.0		
	ST-MAM-BS3		0.000	0.000	0.000	0.000	0.000	0.000	0.000					0.0		
	ST-MAM-BS4		0.000	0.000	0.000									0.0		
2018-08-27	ST-MAM-BS1	15:40													0.0	0.0
	ST-MAM-BS2		0.000	0.000	0.000	0.000	0.000						0.0			
	ST-MAM-BS3		0.000	0.000	0.000	0.000	0.000	0.000	0.0					0.0		
	ST-MAM-BS4		0.000	0.000	0.000									0.0		
2018-09-01	ST-MAM-BS1	10:24													0.0	0.0
	ST-MAM-BS2		0.000	0.000	0.000	0.000	0.000	0.000						0.0		
	ST-MAM-BS3		0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.00				0.0		
	ST-MAM-BS4		0.000	0.000										0.0		
2018-09-04	ST-MAM-BS1	15:00													0.0	0.0
	ST-MAM-BS2		0.000	0.000	0.000	0.000	0.000	0.000						0.0		
	ST-MAM-BS3		0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.00				0.0		
	ST-MAM-BS4		0.000	0.000										0.0		
2018-09-15	ST-MAM-BS1	12:00													0.4	0.5
	ST-MAM-BS2		0.370	0.330	0.310	0.370								0.5		
	ST-MAM-BS3		0.510	0.470	0.520	0.440								0.5		
	ST-MAM-BS4		0.410	0.430	0.410	0.490	0.390	0.460	0.460					0.1		
2018-11-01	ST-MAM-BS1	14:00													1.1	1.8
	ST-MAM-BS2		0.810	0.650	1.080	1.130								1.6		
	ST-MAM-BS3		0.520	0.590	0.520	0.690	1.550	1.64						1.8		
	ST-MAM-BS4		0.230	0.380	1.030	1.140	1.220	1.770	1.620					0.0		
2018-11-25	ST-MAM-BS1	13:00													0.9	1.2
	ST-MAM-BS2		0.070	0.320	0.200	0.900								1.2		
	ST-MAM-BS3		1.240	1.070	0.300	0.890	1.070							1.2		
	ST-MAM-BS4		12:50	0.370	0.230	0.028	0.610	0.910	1.0	1.23				0.0		
2018-12-13	ST-MAM-BS1	12:50													4.5	4.5
	ST-MAM-BS2		12:38	2.420	4.540	0.530	3.900							0.4		
	ST-MAM-BS3		12:25	0.000	0.000	0.000	0.230	0.430						0.7		
	ST-MAM-BS4		12:12	0.000	0.000	0.040	0.700	0.290	0.4	0.44				0.1		
			0.090	0.080												

Table B-8. Calculated TSS concentrations for dike construction monitoring stations ST-MAM-BS-1, 2, 3, 4

Date	Station	Time	Calculated TSS Profile (meters below surface; units mg/L)										Max day	Max 24H	Mean 24H	7-Day moving-AVG	30-day moving-AVG		
			0	1	2	3	4	5	6	7	8	9						10	
2018-08-07	ST-MAM-BS1	14:15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	ST-MAM-BS2	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
	ST-MAM-BS3	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
	ST-MAM-BS4	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
2018-08-21	ST-MAM-BS1	10:30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	ST-MAM-BS2	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
	ST-MAM-BS3	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
	ST-MAM-BS4	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
2018-08-27	ST-MAM-BS1	15:40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	ST-MAM-BS2	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
	ST-MAM-BS3	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
	ST-MAM-BS4	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
2018-09-01	ST-MAM-BS1	10:24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	ST-MAM-BS2	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
	ST-MAM-BS3	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
	ST-MAM-BS4	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
2018-09-04	ST-MAM-BS1	15:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	ST-MAM-BS2	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
	ST-MAM-BS3	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
	ST-MAM-BS4	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
2018-09-15	ST-MAM-BS1	12:00	0.079	0.070	0.066	0.079	0.079	0.079	0.079	0.079	0.079	0.079	0.105	0.105	0.052	0.037	0.037	0.018	
	ST-MAM-BS2	0:00	0.111	0.102	0.113	0.095	0.095	0.095	0.095	0.095	0.095	0.095							0.095
	ST-MAM-BS3	0:00	0.088	0.093	0.088	0.106	0.084	0.099	0.099	0.099	0.099	0.099							0.099
	ST-MAM-BS4	0:00	0.018	0.020	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004							0.004
2018-11-01	ST-MAM-BS1	14:00	0.179	0.143	0.242	0.254	0.254	0.254	0.254	0.254	0.254	0.254	0.238	0.206	0.155	0.139	0.139	0.088	
	ST-MAM-BS2	0:00	0.113	0.129	0.113	0.152	0.354	0.375	0.375	0.375	0.375	0.375							0.375
	ST-MAM-BS3	0:00	0.048	0.081	0.231	0.256	0.275	0.406	0.370	0.370	0.370	0.370							0.370
	ST-MAM-BS4	0:00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
2018-11-25	ST-MAM-BS1	13:00	0.014	0.068	0.042	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.204	0.081	0.180	0.180	0.180	0.178	
	ST-MAM-BS2	12:50	0.280	0.240	0.063	0.198	0.240	0.240	0.240	0.240	0.240	0.240							0.240
	ST-MAM-BS3	12:30	0.079	0.048	0.005	0.133	0.203	0.214	0.278	0.278	0.278	0.278							0.278
	ST-MAM-BS4	12:20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							0.000
2018-12-13	ST-MAM-BS1	12:50	0.564	1.088	0.115	0.928	0.928	0.928	0.928	0.928	0.928	0.928	0.674	0.674	0.516	0.516	0.516	0.436	
	ST-MAM-BS2	12:38	0.000	0.000	0.000	0.048	0.093	0.093	0.093	0.093	0.093	0.093							0.093
	ST-MAM-BS3	12:25	0.000	0.000	0.008	0.154	0.061	0.081	0.095	0.095	0.095	0.095							0.095
	ST-MAM-BS4	12:12	0.018	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016							0.016

Table B-1. Measured turbidity values for dike construction monitoring stations ST-WT-DC-1, 2, 3, 4.

Date	Station	Time	Turbidity Depth Profile (meters below surface; units: NTU)										Max 24H	Daily Max - all stations	
			0	1	2	3	4	5	6	7	8	9			10
2018-07-27	ST-WT-DC1	15:00			0.12		0.06							0.1	0.1
	ST-WT-DC2				0.05		0.03		0.05					0.1	
	ST-WT-DC3				0.02									0.0	
	ST-WT-DC4				0.05									0.1	
2018-07-28	ST-WT-DC1	10:30			0.01		0.07							0.1	0.3
	ST-WT-DC2				0.04		0.02		0.02				0.0		
	ST-WT-DC3				0.00								0.0		
	ST-WT-DC4				0.31								0.3		
2018-07-28	ST-WT-DC1	15:00			0.01		0.00							0.0	2.3
	ST-WT-DC2				0.06		0.02		0.01				0.1		
	ST-WT-DC3				0.02		0.02						0.0		
	ST-WT-DC4				2.30								2.3		
2018-07-29	ST-WT-DC1	8:00			0.40		0.36							0.4	1.8
	ST-WT-DC2				0.83		0.81		0.81				0.8		
	ST-WT-DC3				0.48		0.47						0.5		
	ST-WT-DC4				1.30		1.80						1.8		
2018-07-29	ST-WT-DC1	17:30												0.0	1.9
	ST-WT-DC2				0.67		0.71		0.75				0.8		
	ST-WT-DC3				0.66		0.58						0.7		
	ST-WT-DC4				1.60		1.90						1.9		
2018-07-30	ST-WT-DC1	11:30	1.05	1.03	1.00									1.1	1.6
	ST-WT-DC2	11:40	0.86	0.87	0.85	0.91	0.86	0.80						0.9	
	ST-WT-DC3	8:30	0.95	0.97	1.00									1.0	
	ST-WT-DC4	8:45	1.43	1.55	1.63									1.6	
2018-07-30	ST-WT-DC1	16:30	0.86	0.86	0.93									0.9	1.8
	ST-WT-DC2		0.86	0.80	0.86	0.90	0.97	0.82					1.0		
	ST-WT-DC3		0.85	0.82	0.87									0.9	
	ST-WT-DC4		1.74	1.83	1.82									1.8	
2018-07-31	ST-WT-DC1	10:45	0.86	0.91	0.95	0.96								1.0	1.0
	ST-WT-DC2		0.96	0.98	0.98	0.95	0.99	0.99						1.0	
	ST-WT-DC3		0.97	0.91	0.97	0.94								1.0	
	ST-WT-DC4		0.97	0.97	0.95									1.0	
2018-07-31	ST-WT-DC1	17:00	0.78	0.82	0.84	0.82								0.8	1.1
	ST-WT-DC2		0.96	0.94	0.93	0.93	0.87	0.94						1.0	
	ST-WT-DC3		1.03	1.09	1.04	1.11								1.1	
	ST-WT-DC4		1.09	0.97	0.99									1.1	
2018-08-01	ST-WT-DC1	10:10	0.85	0.85	0.84									0.9	1.2
	ST-WT-DC2		1.16	1.06	1.16	1.12	1.18	1.15						1.2	
	ST-WT-DC3		1.13	1.15	1.12	1.12								1.2	
	ST-WT-DC4		1.14	1.07	1.07									1.1	
2018-08-01	ST-WT-DC1	16:50	1.14	1.47	1.51									1.5	6.3
	ST-WT-DC2		1.19	1.21	1.12	1.39	1.09	1.13						1.4	
	ST-WT-DC3		1.14	1.01	1.09	1.12								1.1	
	ST-WT-DC4		4.95	6.30	6.15									6.3	
2018-08-02	ST-WT-DC1	11:15	2.40	2.41	2.42	2.44								2.4	4.2
	ST-WT-DC2		1.76	1.69	1.86	1.95	1.84	2.15	2.09					2.2	
	ST-WT-DC3		2.13	2.29	2.25	2.27								2.3	
	ST-WT-DC4		4.20	3.95	4.00									4.2	
2018-08-02	ST-WT-DC1	16:30	2.28	2.10	2.17									2.3	3.5
	ST-WT-DC2		2.49	2.39	2.37	2.68	2.89	2.70						2.9	
	ST-WT-DC3		2.00	2.04	2.10	2.23								2.2	
	ST-WT-DC4		3.52	3.35	3.51									3.5	
2018-08-03	ST-WT-DC1	8:30	1.58	1.80	1.82									1.8	3.1
	ST-WT-DC2		2.00	2.15	2.49	2.41	2.48	3.10						3.1	
	ST-WT-DC3		2.02	1.87	1.84	1.81								2.0	
	ST-WT-DC4		1.89	2.01	2.08									2.1	
2018-08-03	ST-WT-DC1	14:30	2.58	2.39	2.44									2.6	3.9
	ST-WT-DC2		3.18	3.21	3.10	3.03	3.54	3.25	3.34					3.5	
	ST-WT-DC3		3.89	3.47	3.32	3.28								3.9	
	ST-WT-DC4		1.96	1.89	1.98									2.0	
2018-08-04			no sampling done due to high winds												
2018-08-05	ST-WT-DC1	10:00	2.84	2.63	2.53									2.8	3.6
	ST-WT-DC2		2.93	2.90	2.88	2.76	2.86	2.74						2.9	
	ST-WT-DC3		2.95	3.12	2.71	3.11								3.1	
	ST-WT-DC4		3.21	3.29	3.62									3.6	
2018-08-06	ST-WT-DC1	10:30	2.52	2.27	2.40									2.5	3.5
	ST-WT-DC2		2.75	2.45	2.84	2.55	2.76	2.70	2.67					2.8	
	ST-WT-DC3		3.01	2.80	3.21	3.40								3.4	
	ST-WT-DC4		2.78	2.97	3.47									3.5	
2018-08-06	ST-WT-DC1	16:05	2.40	2.14	2.36									2.4	10.6
	ST-WT-DC2		10.33	10.55	8.31	6.73	6.14	5.03	4.13					10.6	
	ST-WT-DC3		2.47	2.36	2.48	2.34								2.5	
	ST-WT-DC4		2.56	2.69	2.73									2.7	

Table B-1. Measured turbidity values for dike construction monitoring stations ST-WT-DC-1, 2, 3, 4.

Date	Station	Time	Turbidity Depth Profile (meters below surface; units: NTU)										Max 24H	Daily Max - all stations		
			0	1	2	3	4	5	6	7	8	9			10	
2018-08-07	ST-WT-DC1	8:00		2.22	2.19	2.10									2.2	2.3
	ST-WT-DC2			2.06	2.27	2.12	2.10	2.18	2.13						2.3	
	ST-WT-DC3			2.17	2.11	2.34									2.3	
	ST-WT-DC4			1.99	2.27										2.3	
2018-08-07	ST-WT-DC1	16:15		2.08	2.02	2.17	1.95	1.98	2.09						2.2	2.4
	ST-WT-DC2			1.81	2.19	2.11	2.19	2.09	1.93	1.90					2.2	
	ST-WT-DC3			2.14	2.02	1.88	2.18								2.2	
	ST-WT-DC4			2.44	2.32	2.22									2.4	
2018-08-08	ST-WT-DC1	8:35		1.81	2.00	2.12	1.90							2.1	2.4	
	ST-WT-DC2			2.42	1.88	1.84	1.97	1.86	1.94	1.88				2.4		
	ST-WT-DC3			1.80	1.94	1.88	1.92							1.9		
	ST-WT-DC4			1.74	1.86	1.85								1.9		
2018-08-08	ST-WT-DC1	14:30		2.54	2.48	2.44	2.69							2.7	2.7	
	ST-WT-DC2			1.73	1.98	1.79	1.76	1.65	1.82					2.0		
	ST-WT-DC3			1.63	1.80	1.73								1.8		
	ST-WT-DC4			2.15	2.09	2.51								2.5		
2018-08-09	ST-WT-DC1	9:45		1.71	1.82	1.60								1.8	2.0	
	ST-WT-DC2			1.70	1.84	1.88	1.89							1.9		
	ST-WT-DC3			1.82	1.80	1.71	1.78	1.99	1.70	1.86				2.0		
	ST-WT-DC4			1.80	1.86	1.79								1.9		
2018-08-09	ST-WT-DC1	16:00		1.70	1.75	1.62								1.8	2.0	
	ST-WT-DC2			1.58	1.60	1.67	1.66							1.7		
	ST-WT-DC3			1.97	1.84	1.78	1.98	1.99	1.86	1.94	1.91			2.0		
	ST-WT-DC4			1.45	1.48	1.29								1.5		
2018-08-10	ST-WT-DC1	7:35		1.85	2.01	1.81	1.98	1.84						2.0	2.2	
	ST-WT-DC2			1.62	1.81	1.88	1.97	1.95	1.74	1.77				2.0		
	ST-WT-DC3			0.00	0.03	0.21	1.75							1.8		
	ST-WT-DC4			2.15	2.03	2.11								2.2		
2018-08-10	ST-WT-DC1	17:25		2.10	2.46	1.84								2.5	2.5	
	ST-WT-DC2			1.84	1.52	1.94	1.47	1.73	2.25	1.83				2.3		
	ST-WT-DC3			2.22	1.78	1.77	1.99							2.2		
	ST-WT-DC4			2.47	1.98	1.77								2.5		
2018-08-11	ST-WT-DC1	10:00		2.47	2.64									2.6	3.7	
	ST-WT-DC2			2.93	2.82	2.61								2.9		
	ST-WT-DC3			2.46	2.76	3.43	3.56	3.74	3.26					3.7		
	ST-WT-DC4			1.47	1.26	1.42								1.5		
2018-08-12	ST-WT-DC1	7:45		3.31	3.62	4.01								4.0	5.8	
	ST-WT-DC2			3.46	3.67	3.71	3.51	3.52	3.82					3.8		
	ST-WT-DC3			3.43	3.40	3.34								3.4		
	ST-WT-DC4			5.78	5.33	5.46								5.8		
2018-08-13	ST-WT-DC1	7:45		4.23	4.16	3.68								4.2	7.8	
	ST-WT-DC2			4.36	3.83	4.86	4.00	4.08	4.22					4.9		
	ST-WT-DC3			7.83	6.32	6.07	6.05							7.8		
	ST-WT-DC4			4.71	4.51	4.53								4.7		
2018-08-14	ST-WT-DC1	8:15		3.64	3.49									3.6	3.9	
	ST-WT-DC2			3.67	3.76	3.70	3.56	3.53	3.50	3.68				3.8		
	ST-WT-DC3			3.55	3.46	3.60	3.53							3.6		
	ST-WT-DC4			3.83	3.50	3.85								3.9		
2018-08-15	ST-WT-DC1	7:36		3.51	3.49	3.25	3.12							3.5	3.9	
	ST-WT-DC2			3.12	3.21	3.25	3.34	3.25	3.43					3.4		
	ST-WT-DC3			3.25	3.38	3.17	3.37							3.4		
	ST-WT-DC4			3.34	3.93									3.9		
2018-08-16	ST-WT-DC1	16:50		2.94	2.85	2.93								2.9	3.2	
	ST-WT-DC2			3.10	2.91	2.92	2.82	3.01	2.96					3.1		
	ST-WT-DC3			3.05	2.95	3.15								3.2		
	ST-WT-DC4			2.93	2.88	3.05								3.1		
2018-08-17			no sampling staff blocked on road by wildlife													
2018-08-18	ST-WT-DC1	10:30		2.79	2.54	2.43								2.8	2.8	
	ST-WT-DC2			2.70	2.55	2.75	2.54	2.37	2.71					2.8		
	ST-WT-DC3			2.66	2.58	2.45								2.7		
	ST-WT-DC4			2.48	2.55									2.6		
2018-08-19	ST-WT-DC1	18:00		2.21	2.20	2.22								2.2	2.9	
	ST-WT-DC2			2.53	2.40	2.37	2.30	2.37	2.38	2.39				2.5		
	ST-WT-DC3			2.28	2.45	2.37	2.43							2.5		
	ST-WT-DC4			2.71	2.80	2.90								2.9		
2018-08-20	ST-WT-DC1	18:15		2.01	2.12	2.13								2.1	2.3	
	ST-WT-DC2			2.23	2.25	2.15	2.19	2.23	2.26					2.3		
	ST-WT-DC3			2.13	2.13	2.20								2.2		
	ST-WT-DC4			2.16	2.16	2.20								2.2		
2018-08-21	ST-WT-DC1	16:30		2.20	2.06	2.00								2.2	2.2	
	ST-WT-DC2			1.91	2.14	2.03	2.00	2.08	2.14	2.21				2.2		
	ST-WT-DC3			2.00	2.05	2.17	2.10							2.2		
	ST-WT-DC4			2.19	2.10									2.2		
2018-08-22	ST-WT-DC1	16:35		1.66	1.65	1.63	1.58							1.7	2.0	
	ST-WT-DC2			1.85	1.80	1.71	1.65	1.73	1.74	1.62				1.9		

Table B-1. Measured turbidity values for dike construction monitoring stations ST-WT-DC-1, 2, 3, 4.

Date	Station	Time	Turbidity Depth Profile (meters below surface; units: NTU)											Max 24H	Daily Max - all stations	
			0	1	2	3	4	5	6	7	8	9	10			
	ST-WT-DC3			1.74	1.73	1.55	1.65								1.7	
	ST-WT-DC4			1.97	1.74	1.80									2.0	
2018-08-23	ST-WT-DC1	11:20		1.40	1.46	1.47									1.5	
	ST-WT-DC2			1.45	1.47	1.47	1.43	1.48	1.52						1.5	1.7
	ST-WT-DC3			1.54	1.49	1.61									1.6	
	ST-WT-DC4			1.67	1.71										1.7	
2018-08-24	ST-WT-DC1	16:15		1.50	1.35	1.32									1.5	
	ST-WT-DC2			1.23	1.35	1.36	1.40	1.37	1.33						1.4	1.5
	ST-WT-DC3			1.35	1.40	1.35	1.32								1.4	
	ST-WT-DC4			1.38	1.30	1.37									1.4	
2018-08-25	ST-WT-DC1	20:40		1.76	1.61	1.36									1.8	
	ST-WT-DC2			1.13	1.14	1.20	1.07	1.13	1.08	1.08	1.14				1.2	1.8
	ST-WT-DC3			1.23	1.14	1.12	1.08								1.2	
	ST-WT-DC4			1.20	1.11	1.14									1.2	
2018-08-26	ST-WT-DC1	17:10		0.52	0.62	0.60	0.56								0.6	
	ST-WT-DC2			0.63	0.66	0.61	0.62	0.58	0.63	0.56					0.7	1.6
	ST-WT-DC3			0.67	0.62	0.64	0.63								0.7	
	ST-WT-DC4			1.60	1.64	0.89									1.6	
2018-08-27	ST-WT-DC1	17:00		0.33	0.25	0.31									0.3	
	ST-WT-DC2			0.24	0.25	0.19	0.16	0.14	0.16						0.3	0.3
	ST-WT-DC3			0.23	0.24	0.25									0.3	
	ST-WT-DC4			0.24	0.26	0.21									0.3	
2018-08-28	ST-WT-DC1	17:20		0.62	0.64	0.61									0.6	
	ST-WT-DC2			0.67	0.72	0.71	0.69	0.65	0.56	0.63					0.7	13.1
	ST-WT-DC3			0.73	0.70	0.73									0.7	
	ST-WT-DC4			13.08	12.66	11.85									13.1	
2018-08-29	ST-WT-DC1	15:45		0.34	0.46	0.39	0.35								0.5	
	ST-WT-DC2			0.76	0.68	0.62	0.62	0.55	0.49	0.52					0.8	0.8
	ST-WT-DC3			0.62	0.65	0.57	0.58								0.7	
	ST-WT-DC4			0.57	0.52										0.6	
2018-08-30	ST-WT-DC1	8:39		0.62	0.70	0.64									0.7	
	ST-WT-DC2			0.42	0.64	0.61	0.58	0.50	0.54	0.58					0.6	0.8
	ST-WT-DC3			0.70	0.68	0.68	0.63								0.7	
	ST-WT-DC4			0.70	0.75	0.80									0.8	
2018-08-31	ST-WT-DC1	8:40		0.60	0.52	0.50									0.6	
	ST-WT-DC2			0.74	0.72	0.52	0.55	0.46	0.70	0.73					0.7	0.9
	ST-WT-DC3			0.64	0.86	0.58	0.66								0.9	
	ST-WT-DC4			0.74	0.81	0.67									0.8	
2018-09-01	ST-WT-DC1	7:40		0.26	0.36	0.32									0.4	
	ST-WT-DC2			0.48	0.50	0.36	0.31	0.35	0.40	0.55					0.6	0.6
	ST-WT-DC3			0.35	0.33	0.42	0.36								0.4	
	ST-WT-DC4			0.30	0.39	0.20									0.4	
2018-09-02	ST-WT-DC1	7:55		0.25	0.16										0.3	
	ST-WT-DC2			0.40	0.30	0.37	0.45	0.27	0.20	0.29					0.5	0.5
	ST-WT-DC3			0.48	0.38	0.37	0.39								0.5	
	ST-WT-DC4			0.43	0.35	0.35									0.4	
2018-09-03	ST-WT-DC1	8:21		0.51	0.63	0.59	0.60								0.6	
	ST-WT-DC2			0.49	0.60	0.43	0.50	0.43	0.55	0.53	0.62				0.6	0.7
	ST-WT-DC3			0.65	0.54	0.69	0.60								0.7	
	ST-WT-DC4			0.48	0.63	0.66									0.7	
2018-09-04	ST-WT-DC1	8:15		0.32	0.32	0.35	0.32	0.32							0.4	
	ST-WT-DC2			0.49	0.33	0.34	0.39	0.41	0.32	0.36					0.5	0.6
	ST-WT-DC3			0.35	0.32	0.43	0.34								0.4	
	ST-WT-DC4			0.60	0.48	0.32									0.6	
2018-09-05	ST-WT-DC1	8:20		0.29	0.18	0.16									0.3	
	ST-WT-DC2			0.18	0.22	0.22	0.14	0.20	0.20	0.19					0.2	0.3
	ST-WT-DC3			0.31	0.27	0.25	0.30								0.3	
	ST-WT-DC4			0.25	0.29	0.25									0.3	
2018-09-12	ST-WT-DC1	17:45		1.00	0.99	1.16									1.2	
	ST-WT-DC2			1.12	0.97	1.03									1.1	1.3
	ST-WT-DC3			1.02	1.04	1.00									1.0	
	ST-WT-DC4			1.11	1.30	1.06									1.3	
2018-09-13	ST-WT-DC1	17:10		0.98	1.05	1.35									1.4	
	ST-WT-DC2			1.11	1.08	1.21									1.2	1.5
	ST-WT-DC3			1.45	1.02	1.00									1.5	
	ST-WT-DC4			0.96	1.10	1.04									1.1	
2018-09-14	ST-WT-DC1	11:00		0.78	0.60	0.54									0.8	
	ST-WT-DC2			0.33	0.35	0.33	0.32	0.34	0.35						0.4	0.8
	ST-WT-DC3			0.33	0.36	0.31									0.4	
	ST-WT-DC4			0.45	0.47	0.44									0.5	
2018-09-15	ST-WT-DC1	17:30		0.23	0.31	0.26	0.29	0.25							0.3	
	ST-WT-DC2			0.26	0.25	0.32	0.27	0.18	0.21	0.24	0.26				0.3	0.3
	ST-WT-DC3			0.27	0.22	0.26	0.20								0.3	
	ST-WT-DC4			0.24	0.22	0.19									0.2	

Table B-1. Measured turbidity values for dike construction monitoring stations ST-WT-DC-1, 2, 3, 4.

Date	Station	Time	Turbidity Depth Profile (meters below surface; units: NTU)										Max 24H	Daily Max - all stations		
			0	1	2	3	4	5	6	7	8	9			10	
2018-09-17	ST-WT-DC1	17:15		0.12	0.12	0.09									0.1	0.2
	ST-WT-DC2		0.10	0.11	0.11	0.12	0.09	0.10	0.08					0.1		
	ST-WT-DC3		0.01	0.11	0.09									0.1		
	ST-WT-DC4		0.15	0.08	0.03									0.2		
2018-09-20	ST-WT-DC1	17:10		0.20	0.22	0.19	0.22								0.2	0.3
	ST-WT-DC2		0.20	0.19	0.23	0.21	0.19	0.22	0.14	0.17				0.2		
	ST-WT-DC3		0.26	0.25	0.22	0.16								0.3		
	ST-WT-DC4		0.28	0.28	0.24									0.3		
2018-09-21	ST-WT-DC1	17:20		0.30	0.27	0.28	0.24	0.26							0.3	0.3
	ST-WT-DC2		0.24	0.17	0.15	0.17	0.15	0.13	0.24					0.2		
	ST-WT-DC3		0.16	0.14	0.12	0.10								0.2		
	ST-WT-DC4		0.13	0.09	0.12									0.1		
2018-09-23	ST-WT-DC1	16:30		0.00	0.00	0.00									0.0	0.0
	ST-WT-DC2		0.00	0.00	0.00	0.00	0.00	0.00						0.0		
	ST-WT-DC3		0.00	0.00	0.00									0.0		
	ST-WT-DC4		0.00	0.00	0.00									0.0		
2018-09-24	ST-WT-DC1	9:41		0.00	0.00	0.00									0.0	0.2
	ST-WT-DC2		0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.0		
	ST-WT-DC3		0.15	0.02	0.05	0.04								0.2		
	ST-WT-DC4		0.10	0.02	0.06									0.1		
2018-10-16	ST-WT-DC1	15:50		0.11	0.21	0.17									0.2	0.2
	ST-WT-DC2		0.14	0.11	0.17	0.16	0.20	0.14						0.2		
	ST-WT-DC3		0.08	0.16	0.16	0.17								0.2		
	ST-WT-DC4		0.11	0.15	0.18									0.2		
2018-10-31	ST-WT-DC1	15:45		0.02	0.06	0.07									0.1	0.2
	ST-WT-DC2		0.01	0.02	0.02	0.03	0.07	0.04	0.02					0.1		
	ST-WT-DC3		0.10	0.12	0.15	0.14								0.2		
	ST-WT-DC4		0.09	0.08	0.11									0.1		
2018-11-13	ST-WT-DC1	12:35		7.27	7.20	7.20	7.82								7.8	7.8
	ST-WT-DC2	13:00		6.48	6.76	6.57	6.42	6.38	6.37						6.8	
	ST-WT-DC3	13:20		6.34	6.32	6.32	6.33								6.3	
	ST-WT-DC4	13:50		7.39	7.10	6.77									7.4	
2018-12-12	ST-WT-DC1	14:49		0.24	0.30										0.3	5.6
	ST-WT-DC2	15:00		0.00	0.00	0.00	0.00	0.00	0.00						0.0	
	ST-WT-DC3	15:15		4.63	5.56	3.72									5.6	
	ST-WT-DC4	16:15		0.00	0.00	0.00									0.0	
2018-12-18	ST-WT-DC1	14:25		0.88	0.81	0.64									0.9	13.5
	ST-WT-DC2	14:05		0.10	0.06	0.00	0.00	0.00	0.00	0.00					0.1	
	ST-WT-DC3	14:35		13.51	12.21	8.61	3.69								13.5	
	ST-WT-DC4	14:50		0.00	0.00	0.00									0.0	

Table B-2. Calculated TSS concentrations for dike construction monitoring stations ST-WT-DC-1, 2, 3, 4

Date	Station	Time	Calculated TSS Profile (meters below surface; units mg/L)										Max day	Max 24H	Mean 24H	7-Day moving-AVG	30-day moving-AVG		
			0	1	2	3	4	5	6	7	8	9						10	
2018-07-27	ST-WT-DC1	15:00			0.024		0.012									0.024	0.018		
	ST-WT-DC2	0:00			0.010		0.006			0.010						0.010	0.008		
	ST-WT-DC3	0:00			0.004					0.004						0.004	0.004		
	ST-WT-DC4	0:00			0.010											0.010	0.010		
2018-07-28	ST-WT-DC1	10:30			0.002		0.014									0.014	0.008	0.013	0.013
	ST-WT-DC2	0:00			0.008		0.004			0.004						0.008	0.005	0.007	0.007
	ST-WT-DC3	0:00			0.000											0.000	0.000	0.002	0.002
	ST-WT-DC4	0:00			0.066											0.066	0.066	0.038	0.038
2018-07-28	ST-WT-DC1	15:00			0.002		0.000									0.002	0.001	0.009	0.009
	ST-WT-DC2	0:00			0.012		0.004			0.002						0.012	0.006	0.006	0.006
	ST-WT-DC3	0:00			0.004		0.004									0.004	0.004	0.002	0.002
	ST-WT-DC4	0:00			0.534											0.534	0.534	0.203	0.203
2018-07-29	ST-WT-DC1	8:00			0.086		0.077									0.086	0.081	0.027	0.027
	ST-WT-DC2	0:00			0.184		0.179			0.179						0.184	0.181	0.050	0.050
	ST-WT-DC3	0:00			0.104		0.102									0.104	0.103	0.028	0.028
	ST-WT-DC4	0:00			0.294		0.414									0.414	0.354	0.241	0.241
2018-07-29	ST-WT-DC1	17:30																0.022	0.022
	ST-WT-DC2	0:00			0.147		0.156			0.166						0.166	0.156	0.071	0.071
	ST-WT-DC3	0:00			0.145		0.127			0.145						0.145	0.136	0.049	0.049
	ST-WT-DC4	0:00			0.366		0.438			0.438						0.438	0.402	0.273	0.273
2018-07-30	ST-WT-DC1	11:30			0.235	0.231	0.224									0.235	0.230	0.068	0.068
	ST-WT-DC2	11:40			0.191	0.193	0.189	0.203	0.191	0.177						0.203	0.191	0.091	0.091
	ST-WT-DC3	8:30			0.212	0.217	0.224									0.224	0.217	0.077	0.077
	ST-WT-DC4	8:45			0.325	0.354	0.373									0.373	0.351	0.286	0.286
2018-07-30	ST-WT-DC1	16:30			0.191	0.191	0.207									0.207	0.196	0.076	0.089
	ST-WT-DC2	0:00			0.191	0.177	0.191	0.200	0.217	0.182						0.217	0.193	0.106	0.106
	ST-WT-DC3	0:00			0.189	0.182	0.193									0.193	0.188	0.093	0.093
	ST-WT-DC4	0:00			0.399	0.421	0.418									0.421	0.413	0.304	0.304
2018-07-31	ST-WT-DC1	10:45			0.191	0.203	0.212									0.214	0.205	0.092	0.106
	ST-WT-DC2	0:00			0.214	0.219	0.212	0.212	0.221	0.221						0.221	0.218	0.120	0.120
	ST-WT-DC3	0:00			0.217	0.203	0.217	0.210								0.217	0.211	0.108	0.108
	ST-WT-DC4	0:00			0.217	0.217	0.212									0.217	0.215	0.293	0.293
2018-07-31	ST-WT-DC1	17:00			0.172	0.182	0.186	0.182								0.186	0.181	0.102	0.115
	ST-WT-DC2	0:00			0.214	0.210	0.207	0.207	0.193	0.210						0.214	0.207	0.129	0.129
	ST-WT-DC3	0:00			0.231	0.245	0.233	0.249								0.249	0.239	0.122	0.122
	ST-WT-DC4	0:00			0.245	0.217	0.221									0.245	0.228	0.286	0.286
2018-08-01	ST-WT-DC1	10:10			0.189	0.189	0.186									0.189	0.188	0.123	0.123
	ST-WT-DC2	0:00			0.261	0.238	0.261	0.252	0.266	0.259						0.266	0.256	0.142	0.142
	ST-WT-DC3	0:00			0.254	0.259	0.252	0.252								0.259	0.254	0.136	0.136
	ST-WT-DC4	0:00			0.256	0.240	0.240									0.256	0.246	0.282	0.282
2018-08-01	ST-WT-DC1	16:50			0.256	0.335	0.344									0.344	0.312	0.129	0.142
	ST-WT-DC2	0:00			0.268	0.273	0.252	0.316	0.245	0.254						0.316	0.268	0.154	0.154
	ST-WT-DC3	0:00			0.256	0.226	0.245	0.252								0.256	0.245	0.146	0.146
	ST-WT-DC4	0:00			1.191	1.533	1.495									1.533	1.406	0.384	0.384
2018-08-02	ST-WT-DC1	11:15			0.559	0.561	0.564	0.568								0.568	0.563	0.196	0.180
	ST-WT-DC2	0:00			0.404	0.387	0.428	0.450	0.423	0.498	0.483					0.498	0.439	0.178	0.177
	ST-WT-DC3	0:00			0.493	0.532	0.522	0.527								0.532	0.519	0.177	0.177
	ST-WT-DC4	0:00			1.003	0.941	0.953									1.003	0.966	0.432	0.432
2018-08-02	ST-WT-DC1	16:30			0.530	0.486	0.503									0.530	0.506	0.207	0.207
	ST-WT-DC2	0:00			0.581	0.556	0.551	0.627	0.679	0.632						0.679	0.604	0.210	0.210
	ST-WT-DC3	0:00			0.462	0.471	0.486	0.517								0.517	0.484	0.200	0.200
	ST-WT-DC4	0:00			0.834	0.792	0.831									0.834	0.819	0.462	0.462
2018-08-03	ST-WT-DC1	8:30			0.361	0.414	0.418									0.418	0.398	0.239	0.222
	ST-WT-DC2	0:00			0.462	0.498	0.581	0.561	0.578	0.730						0.730	0.568	0.253	0.236
	ST-WT-DC3	0:00			0.467	0.430	0.423	0.416								0.467	0.434	0.233	0.217
	ST-WT-DC4	0:00			0.435	0.464	0.481									0.481	0.460	0.497	0.462
2018-08-03	ST-WT-DC1	14:30			0.603	0.556	0.568									0.603	0.576	0.286	0.247
	ST-WT-DC2	0:00			0.750	0.757	0.730	0.713	0.839	0.767	0.789					0.839	0.764	0.312	0.271
	ST-WT-DC3	0:00			0.926	0.822	0.784	0.775								0.926	0.827	0.297	0.258
	ST-WT-DC4	0:00			0.452	0.435	0.457									0.457	0.448	0.526	0.461
2018-08-04	no sampling done due to high winds																		
2018-08-05	ST-WT-DC1	10:00			0.666	0.615	0.590									0.666	0.624	0.338	0.272
	ST-WT-DC2	0:00			0.688	0.681	0.676	0.647	0.671	0.642						0.688	0.667	0.362	0.296
	ST-WT-DC3	0:00			0.693	0.735	0.634	0.733								0.735	0.699	0.350	0.285
	ST-WT-DC4	0:00			0.757	0.777	0.859									0.859	0.798	0.546	0.482
2018-08-06	ST-WT-DC1	10:30			0.598	0.527	0.559									0.598	0.558	0.378	0.290
	ST-WT-DC2	0:00			0.644	0.571	0.666	0.595	0.647	0.632	0.625					0.666	0.626	0.397	0.315
	ST-WT-DC3	0:00			0.708	0.656	0.757	0.804								0.804	0.731	0.399	0.341
	ST-WT-DC4	0:00			0.652	0.698	0.822									0.822	0.724	0.575	0.496
2018-08-06	ST-WT-DC1	16:05			0.559	0.496	0.549									0.559	0.534	0.390	0.305
	ST-WT-DC2	0:00			2.571	2.628	2.048	1.642	1.492	1.211	0.986					2.628	1.797	0.523	0.397
	ST-WT-DC3	0:00			0.576	0.549	0.578	0.544								0.578	0.562	0.432	0.325
	ST-WT-DC4	0:00			0.598	0.629	0.639									0.639	0.622	0.592	0.503
2018-08-07	ST-WT-DC1	8:00			0.515	0.508	0.486									0.515	0.503	0.411	0.316
	ST-WT-DC2	0:00			0.476	0.527	0.491	0.486											

Table B-3. Measured turbidity values for dike construction monitoring stations ST-WTN-DC-1, 2, 3, 4

Date	Station	Time	Turbidity Depth Profile (meters below surface; units: NTU)										Max 24H	Daily Max - all stations		
			0	1	2	3	4	5	6	7	8	9			10	
2018-08-03	ST-WTN-DC1	15:30		2.25	2.26	1.84	1.83	2.03							2.3	2.3
	ST-WTN-DC2		1.76	1.82	2.02	1.92	1.75	1.75	1.83					2.0		
	ST-WTN-DC3		2.10	1.68	1.55	1.60								2.1		
	ST-WTN-DC4		0.92	0.91	0.95									1.0		
2018-08-07	ST-WTN-DC1	10:30		2.40	2.46	2.28	2.25							2.5	4.0	
	ST-WTN-DC2		2.22	2.23	2.30	2.69	2.76	2.51	3.11	4.01				4.0		
	ST-WTN-DC3		2.44	2.54	2.80									2.8		
	ST-WTN-DC4		2.39	2.46	2.52									2.5		
2018-08-11	ST-WTN-DC1	11:30		8.73	9.03	8.18								9.0	9.6	
	ST-WTN-DC2		7.65	7.82	7.96								8.0			
	ST-WTN-DC3		7.68	6.91	8.21								8.2			
	ST-WTN-DC4		8.03	9.55	8.53								9.6			
2018-08-13	ST-WTN-DC1	17:15		19.43	19.65	19.19	19.48	20.37						20.4	42.2	
	ST-WTN-DC2		16.06	16.17	18.62	18.29	18.21	22.10	29.06	42.22				42.2		
	ST-WTN-DC3		15.08	15.91	19.73	23.02								23.0		
	ST-WTN-DC4		16.25	16.69	17.03									17.0		
2018-08-21	ST-WTN-DC1	16:15		38.64		37.18								38.6	40.4	
	ST-WTN-DC2		40.39		37.81		40.05		38.33				40.4			
	ST-WTN-DC3		37.08		36.59		37.35						37.4			
	ST-WTN-DC4		34.04		33.37								34.0			
2018-08-30	ST-WTN-DC1	16:15		39.00	36.00	51.00								51.0	51.0	
	ST-WTN-DC2		37.00	41.00	41.00	44.00	42.00	45.00	48.00	50.00			50.0			
	ST-WTN-DC3		41.00	43.50	42.00	43.00							43.5			
	ST-WTN-DC4		43.00	38.00	44.00								44.0			
2018-09-03	ST-WTN-DC1	10:23		37.40	38.30	36.20	39.00	36.00	36.60	35.70				39.0	40.5	
	ST-WTN-DC2		35.20	38.20	40.50	35.10	39.20	38.80	37.70				40.5			
	ST-WTN-DC3		38.90	37.20	40.00	38.90							40.0			
	ST-WTN-DC4		36.00	38.50	34.40								38.5			
2018-09-13	ST-WTN-DC1	13:20		24.27	25.46	25.38								25.5	25.5	
	ST-WTN-DC2		24.59	24.54	24.14	24.88	25.21	23.20	23.68	24.73			25.2			
	ST-WTN-DC3		22.67	23.69	22.06								23.7			
	ST-WTN-DC4		21.39	22.52	22.74								22.7			
2018-09-17	ST-WTN-DC1	16:15		18.19	17.19	19.30								19.3	19.7	
	ST-WTN-DC2		17.64	19.69	17.67	18.44	18.13	18.34	18.23	19.15	18.9		19.7			
	ST-WTN-DC3		17.70	17.90									17.9			
	ST-WTN-DC4		18.11	18.60	17.47								18.6			
2018-09-23	ST-WTN-DC1	15:50		13.15	14.14									14.1	16.7	
	ST-WTN-DC2		14.22	14.40	14.26	14.07	15.67	14.23	14.41	14.37			15.7			
	ST-WTN-DC3		13.80	15.00	16.71								16.7			
	ST-WTN-DC4		14.99	14.62									15.0			
2018-10-16	ST-WTN-DC1	17:15		8.19	8.67	8.60								8.7	9.1	
	ST-WTN-DC2		8.08	8.49	8.83	8.78	9.00	8.56	8.73	8.92	9.1		9.1			
	ST-WTN-DC3		8.06	8.35	8.39								8.4			
	ST-WTN-DC4		8.47	8.36	8.54								8.5			
2018-11-14	ST-WTN-DC1	9:41		8.06	8.08	8.00	7.99								0.0	
	ST-WTN-DC2		7.92	7.85	7.91	8.00	8.45	8.61	8.18	8.23	8.28					
	ST-WTN-DC3		8.37	8.17	8.12	8.18										
	ST-WTN-DC4		7.83	7.89	7.94											
2018-11-25	ST-WTN-DC1	14:25		4.94	4.75	4.74	4.67							4.9	5.6	
	ST-WTN-DC2		4.71	3.68	3.83	3.50	4.90	5.64	4.88	4.61	4.5		5.6			
	ST-WTN-DC3		3.22	3.87	3.62	3.71							3.9			
	ST-WTN-DC4		5.01	3.90	3.91	3.39							5.0			
2018-12-13	ST-WTN-DC1	15:40		2.53	2.46	2.35	2.50						2.5	3.4		
2018-12-12	ST-WTN-DC2	16:15		2.56	2.73	2.44	2.53	2.81	3.35	2.68	2.50		3.4			
2018-12-13	ST-WTN-DC3	15:53		2.44	2.57	2.52	2.71						2.7			
2018-12-13	ST-WTN-DC4	16:03		2.24	2.41	2.47							2.5			
2018-12-18	ST-WTN-DC1			2.40	2.47	2.65							2.7	4.5		
2018-12-19	ST-WTN-DC2			4.50	4.50	3.76	2.86	2.44	2.53	2.70	2.51	3.0	4.5			
	ST-WTN-DC3															
	ST-WTN-DC4															

Station unavailable because of the construction of the Ice Pad.
 Station unavailable because of the construction of the Ice Pad.

Table B-4. Calculated TSS concentrations for dike construction monitoring stations ST-WTN-DC-1, 2, 3, 4

Date	Station	Time	Calculated TSS Profile (meters below surface; units mg/L)											Max day	Max 24H	Mean 24H	7-Day moving-AVG	30-day moving-AVG		
			0	1	2	3	4	5	6	7	8	9	10							
2018-08-03	ST-WTN-DC1	15:30		0.522	0.525	0.423	0.421	0.469									0.525	0.472		
	ST-WTN-DC2	0:00		0.404	0.418	0.467	0.442	0.402	0.402	0.402	0.421						0.525	0.467	0.422	
	ST-WTN-DC3	0:00		0.486	0.385	0.354	0.366											0.486	0.397	
	ST-WTN-DC4	0:00		0.205	0.203	0.212												0.212	0.207	
2018-08-07	ST-WTN-DC1	10:30		0.559	0.573	0.530	0.522										0.956	0.573	0.546	0.509
	ST-WTN-DC2	0:00		0.515	0.517	0.534	0.629	0.647	0.586	0.733	0.956						0.956	0.640	0.531	0.531
	ST-WTN-DC3	0:00		0.568	0.593	0.656											0.956	0.606	0.502	0.502
	ST-WTN-DC4	0:00		0.556	0.573	0.588											0.588	0.573	0.390	0.390
2018-08-11	ST-WTN-DC1	11:30		2.156	2.234	2.014											2.368	2.234	2.135	1.051
	ST-WTN-DC2	0:00		1.878	1.922	1.958											2.368	1.958	1.919	0.994
	ST-WTN-DC3	0:00		1.886	1.688	2.022											2.368	2.022	1.865	0.956
	ST-WTN-DC4	0:00		1.976	2.368	2.104											2.368	2.150	0.976	0.976
2018-08-13	ST-WTN-DC1	17:15		4.978	5.037	4.914	4.991	5.230									11.208	5.230	5.030	2.570
	ST-WTN-DC2	0:00		4.079	4.108	4.761	4.673	4.652	5.696	7.584	11.208						11.208	11.208	5.845	2.801
	ST-WTN-DC3	0:00		3.819	4.039	5.058	5.944										11.208	5.944	4.715	2.395
	ST-WTN-DC4	0:00		4.129	4.246	4.337											11.208	4.337	4.237	2.320
2018-08-21	ST-WTN-DC1	16:15		10.216		9.813											10.701	10.216	10.015	3.639
	ST-WTN-DC2	0:00		10.701		9.987		10.607		10.131							10.701	10.701	10.356	3.836
	ST-WTN-DC3	0:00		9.785		9.650		9.860									10.701	9.860	9.765	3.470
	ST-WTN-DC4	0:00		8.948		8.764											10.701	8.948	8.856	3.204
2018-08-30	ST-WTN-DC1	16:15		10.316	9.487	13.657											13.657	13.657	11.153	10.584
	ST-WTN-DC2	0:00		9.763	10.870	10.870	11.703	11.147	11.981	12.818	13.377						13.657	13.377	11.566	10.961
	ST-WTN-DC3	0:00		10.870	11.564	11.147	11.425										13.657	11.564	11.251	10.508
	ST-WTN-DC4	0:00		11.425	10.039	11.703											13.657	11.703	11.056	9.956
2018-09-03	ST-WTN-DC1	10:23		9.874	10.122	9.543	10.316	9.487	9.653	9.405							10.731	10.316	9.771	10.313
	ST-WTN-DC2	0:00		9.267	10.095	10.731	9.240	10.371	10.261	9.957							10.731	10.731	9.989	10.637
	ST-WTN-DC3	0:00		10.288	9.818	10.593	10.288										10.731	10.593	10.247	10.421
	ST-WTN-DC4	0:00		9.487	10.178	9.047											10.731	10.178	9.571	9.827
2018-09-13	ST-WTN-DC1	13:20		6.282	6.604	6.582											6.604	6.604	6.489	9.357
	ST-WTN-DC2	0:00		6.368	6.355	6.246	6.447	6.536	5.992	6.122	6.406						6.604	6.536	6.309	9.555
	ST-WTN-DC3	0:00		5.849	6.125	5.685											6.604	6.125	5.886	9.287
	ST-WTN-DC4	0:00		5.504	5.809	5.868											6.604	5.868	5.727	8.802
2018-09-17	ST-WTN-DC1	16:15		4.646	4.379	4.943											5.048	4.943	4.656	7.036
	ST-WTN-DC2	0:00		4.499	5.048	4.507	4.713	4.630	4.686	4.657	4.904						5.048	5.048	4.706	7.241
	ST-WTN-DC3	0:00		4.515	4.569												5.048	4.569	4.542	6.896
	ST-WTN-DC4	0:00		4.625	4.756	4.454											5.048	4.756	4.612	6.601
2018-09-23	ST-WTN-DC1	15:50		3.309	3.570												4.252	3.570	3.440	7.222
	ST-WTN-DC2	0:00		3.591	3.639	3.602	3.552	3.975	3.594	3.642	3.631						4.252	3.975	3.653	7.489
	ST-WTN-DC3	0:00		3.481	3.798	4.252											4.252	4.252	3.843	7.179
	ST-WTN-DC4	0:00		3.795	3.697												4.252	3.795	3.746	6.829
2018-10-16	ST-WTN-DC1	17:15		2.017	2.141	2.123											2.226	2.141	2.093	6.803
	ST-WTN-DC2	0:00		1.989	2.094	2.182	2.169	2.226	2.112	2.156	2.205						2.226	2.226	2.142	6.960
	ST-WTN-DC3	0:00		1.983	2.058	2.068											2.226	2.068	2.037	6.796
	ST-WTN-DC4	0:00		2.089	2.061	2.107											2.226	2.107	2.086	6.522
2018-11-14	ST-WTN-DC1	9:41		1.983	1.989	1.968	1.965										2.125	1.989	1.976	5.654
	ST-WTN-DC2	10:00		1.947	1.929	1.945	1.968	2.084	2.125	2.014	2.027						2.125	2.125	2.005	5.767
	ST-WTN-DC3	10:30		2.063	2.012	1.999	2.014										2.125	2.063	2.022	5.690
	ST-WTN-DC4	10:40		1.924	1.940	1.953											2.125	1.953	1.939	5.534
2018-11-25	ST-WTN-DC1	14:25		1.189	1.141	1.138	1.121										1.365	1.189	1.147	4.225
	ST-WTN-DC2	14:35		1.131	0.874	0.911	0.829	1.179	1.365	1.174	1.106	1.076					1.365	1.365	1.071	4.268
	ST-WTN-DC3	14:50		0.760	0.921	0.859	0.881										1.365	0.921	0.855	4.205
	ST-WTN-DC4	15:00		1.206	0.928	0.931	0.802										1.365	1.206	0.967	4.092
2018-12-13	ST-WTN-DC1	15:40		0.590	0.573	0.547	0.583										0.792	0.590	0.573	2.911
	ST-WTN-DC2	16:15		0.598	0.639	0.568	0.590	0.659	0.792	0.627	0.583						0.792	0.792	0.632	2.931
	ST-WTN-DC3	15:53		0.568	0.600	0.588	0.634										0.792	0.634	0.598	2.826
	ST-WTN-DC4	16:03		0.520	0.561	0.576											0.792	0.576	0.552	2.804
2018-12-18	ST-WTN-DC1	0:00		0.559	0.576	0.620											1.078	0.620	0.585	2.067
	ST-WTN-DC2	0:00		1.078	1.078	0.893	0.671	0.568	0.590	0.632	0.586	0.698					1.078	1.078	0.755	2.138
	ST-WTN-DC3	0:00																		
	ST-WTN-DC4	0:00																		

APPENDIX C

Routine Water Quality Monitoring Results

Table C-2. Complete water quality analysis for dike construction monitoring location WTN-DC

Station	Parameter>>	pH - field	pH lab	Conductivity - field	Temperature - field	HDO - field	Turbidity - field	Alkalinity Total	Alkalinity bicarbonate	Alkalinity carbonate	Alkalinity hydroxide	Ammonia (NH3)
	Units>>			µS/cm	mg/l	C	NTU	mg CaCO3/L	mg/L	mg/L	mg/L	mg N/L
	Guideline^>>		6.5-9									
ST-WTN-DC-2	2018-09-03	6.7		63.7	11.28	8.03	40.5	9	9	< 0.02	< 0.02	< 0.01
ST-WTN-DC-3	2018-09-17	6.8	6.99	80.1	11.9	2.9	17.64	10	10	< 2	< 2	< 0.01
ST-WTN-DC-3	2018-09-24	6.34	7.17	192	12.84		14.88	12	12	< 2	< 2	< 0.01
ST-WTN-DC-2	2018-10-16	7.26	7.19	171.3	14.5	1.08	8.08	14	14	< 2	< 2	< 0.01
ST-WTN-DC-2	2018-11-14	6.63	6.98	181.4	12.59	11.17	4.19	15	15	< 2	< 2	< 0.01
ST-WTN-DC-2	2018-11-26	6.87	7.11	136.2	13.86	0.8	3.05	18	18	< 2	< 2	< 0.01
ST-WTN-DC-2	2018-12-13	6.85		207.25	16.38	1.25	2.44					
ST-WTN-DC-2	2918-12-18	7.42		213.3	16.09	1.33	2.65					

^CCME Water Quality Guideline for the Protection of Aquatic Life, unless otherwise indicated.

Guidelines for total metals are applied equally for dissolved metals, except for Al.

*BC MOE guideline: www.env.gov.bc.ca

**short term limit, 25 mg/L above background (<24 h)

Table C-2. Complete water quality analysis for dike construction monitoring location WTN-DC

Station	Parameter>>	Chloride (Cl)	Dissolved organic carbon (DOC)	Hardness	Nitrate	Nitrite	Ortho-phosphate	Phosphorous total	Sulphate (SO ₂ -4)	TDS	TKN (Kjeldahl nitrogen)	TOC
	Units>>	mg/L	mg/L	mg CaCO ₃ /L	mg N/L	mg N/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Guideline^>>				2.9	0.06		0.004				
ST-WTN-DC-2	2018-09-03	12	1.80	25	0.06	0.01	0.04	0.019	4.4	na	na	na
ST-WTN-DC-3	2018-09-17	0.5	0.20	1	0.09	0.01	0.03	0.02	5.6	51	0.22	1.8
ST-WTN-DC-3	2018-09-24	43.8	1.80	64	0.44	0.01	0.02	0.02	6.8	112	0.75	1.8
ST-WTN-DC-2	2018-10-16	34.4	1.90	45	0.32	0.01	0.02	< 0.01	3.8	75	0.28	1.9
ST-WTN-DC-2	2018-11-14	37.9	1.90	52	0.43	0.01	< 0.01	< 0.1	6.1	92	0.27	1.9
ST-WTN-DC-2	2018-11-26	41.3	1.90	63	0.41	0.01	< 0.01	< 0.01	6.4	103	0.42	1.9
ST-WTN-DC-2	2018-12-13											
ST-WTN-DC-2	2918-12-18											

^CCME Water Quality Guideline for the
 Guidelines for total metals are applied e
 *BC MOE guideline: www.env.gov.bc.ca
 **short term limit, 25 mg/L above backg

Table C-2. Complete water quality analysis for dike construction monitoring location WTN-DC

Station	Parameter>>	TSS	Reactive Silicate	Silica (Si)	Chlorophyll A	Aluminum (Al)	Arsenic (As)	Boron (B)	Barium (Ba)	Beryllium (Be)	Cadmium (Cd)	Copper (Cu)	Chromium (Cr)
	Units>>	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Guideline^>>	26 mg/L**				0.1	0.005	1.2*			4E-05	0.002	0.001
ST-WTN-DC-2	2018-09-03	na	na	1.11	0.67	0.44	< 0.0005	< 0.01	0.204	< 0.0005	< 2E-05	0.002	0.0025
ST-WTN-DC-3	2018-09-17	5	na	1.42	1.1	0.46	0.0018	< 0.01	0.0249	< 0.0005	< 2E-05	0.001	0.0032
ST-WTN-DC-3	2018-09-24	9	na	1.06	0.55	0.26	0.0018	< 0.01	0.0332	< 0.0005	< 2E-05	0.001	0.0015
ST-WTN-DC-2	2018-10-16	3		1.6	0.55	0.163	0.0019	< 0.01	0.0268	< 0.0005	< 2E-05	9E-04	0.0011
ST-WTN-DC-2	2018-11-14	2		1	0.49	0.082	< 0.0005	< 0.01	0.0317	< 0.0005	< 2E-05	6E-04	< 0.0006
ST-WTN-DC-2	2018-11-26	1		1.18	0.53	0.073	< 0.0005	< 0.01	0.0359	< 0.0005	< 2E-05	< 5E-04	< 0.0006
ST-WTN-DC-2	2018-12-13												
ST-WTN-DC-2	2918-12-18												

^CCME Water Quality Guideline for the Guidelines for total metals are applied e
 *BC MOE guideline: www.env.gov.bc.ca
 **short term limit, 25 mg/L above backg

Table C-2. Complete water quality analysis for dike construction monitoring location WTN-DC

Station	Parameter>>	Iron (Fe)	Lithium (Li)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Lead (Pb)	Selenium (Se)	Antimony (Sb)	Silver (Ag)	Tin (Sn)	Strontium (Sr)
	Units>>	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Guideline^>>	0.3		0.6578	0.0003	0.073	0.025	0.001	0.001				
ST-WTN-DC-2	2018-09-03	0.063	0.013	0.024	< 1E-05	< 0.0005	0.0031	0.0015	0.0009	< 0.0001	< 0.0001	< 0.001	0.051
ST-WTN-DC-3	2018-09-17	0.8	< 0.005	0.0034	< 1E-05	< 0.0005	0.0032	0.0007	0.001	< 0.0001	< 0.0001	< 0.001	0.068
ST-WTN-DC-3	2018-09-24	0.42	0.011	0.0492	< 1E-05	0.0008	0.003	< 0.0003	< 0.0005	< 0.0001	< 0.0001	< 0.001	0.235
ST-WTN-DC-2	2018-10-16	0.25	< 0.005	0.027	< 1E-05	0.0008	0.0024	< 0.0003	0.0022	< 0.0001	< 0.0001	< 0.001	< 0.005
ST-WTN-DC-2	2018-11-14	0.15	0.009	0.0304	< 1E-05	0.0011	0.003	< 0.0003	0.0014	< 0.0001	< 0.0001	< 0.001	0.195
ST-WTN-DC-2	2018-11-26	0.12	0.01	0.0324	< 1E-05	0.001	0.0032	< 0.0003	0.0011	< 0.0001	< 0.0001	< 0.001	0.249
ST-WTN-DC-2	2018-12-13												
ST-WTN-DC-2	2918-12-18												

^CCME Water Quality Guideline for the
 Guidelines for total metals are applied e
 *BC MOE guideline: www.env.gov.bc.ca
 **short term limit, 25 mg/L above backg

Table C-2. Complete water quality analysis for dike construction monitoring location WTN-DC

Station	Parameter>>	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Dissolved Aluminum (Al)	Dissolved Arsenic (As)	Dissolved Boron (B)	Dissolved Barium (Ba)	Dissolved Beryllium (Be)	Dissolved Cadmium (Cd)
	Units>>	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Guideline^>>		0.0008			0.03	0.05*	0.005				0.00004
ST-WTN-DC-2	2018-09-03	0.02	< 0.0002	< 0.001	< 0.0005	0.05	0.005	0.0005	< 0.01	0.0165	< 0.0005	< 0.00002
ST-WTN-DC-3	2018-09-17	0.02	< 0.0002	< 0.001	0.0011	0.004	0.021	0.0009	< 0.01	0.0185	< 0.0005	< 0.00002
ST-WTN-DC-3	2018-09-24	0.01	< 0.0002	< 0.001	< 0.0005	0.001	0.021	0.0011	< 0.01	0.0389	< 0.0005	< 0.00002
ST-WTN-DC-2	2018-10-16	0.01	0.01	< 0.001	< 0.0005	< 0.001	< 0.0005	0.0016	< 0.01	0.0257	< 0.0005	0.00003
ST-WTN-DC-2	2018-11-14	0.01	< 0.0002	< 0.001	< 0.0005	0.001	< 0.005	0.0005	< 0.01	0.0295	< 0.0005	< 0.00002
ST-WTN-DC-2	2018-11-26	0.02	< 0.0002	< 0.001	< 0.0005	< 0.001	< 0.005	< 0.0005	< 0.01	0.0337	< 0.0005	< 0.00002
ST-WTN-DC-2	2018-12-13											
ST-WTN-DC-2	2918-12-18											

^CCME Water Quality Guideline for the
 Guidelines for total metals are applied e
 *BC MOE guideline: www.env.gov.bc.ca
 **short term limit, 25 mg/L above backg

Table C-2. Complete water quality analysis for dike construction monitoring location WTN-DC

Station	Parameter>>	Dissolved Copper (Cu)	Dissolved Chromium (Cr)	Dissolved Iron (Fe)	Dissolved Lithium (Li)	Dissolved Manganese (Mn)	Dissolved Mercury (Hg)	Dissolved Molybdenum (Mo)	Dissolved Nickel (Ni)	Dissolved Lead (Pb)	Dissolved Selenium (Se)
	Units>>	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Guideline^>>		0.001	0.3		0.6578	0.00026	0.073	0.025	0.001	0.001
ST-WTN-DC-2	2018-09-03	0.0021	0.0021	0.02	0.02	< 0.005	< 0.00001	< 0.0005	0.0012	0.0006	0.0006
ST-WTN-DC-3	2018-09-17	0.0014	< 0.0006	< 0.01	< 0.005	0.0034	< 0.00001	< 0.0005	0.0013	< 0.0003	< 0.0005
ST-WTN-DC-3	2018-09-24	0.0031	< 0.0006	< 0.01	0.014	0.0557	< 0.00001	0.0008	0.003	< 0.0003	< 0.0005
ST-WTN-DC-2	2018-10-16	0.0009	< 0.0006	< 0.01	< 0.005	0.023	< 0.00001	0.0009	0.0018	< 0.0003	< 0.0005
ST-WTN-DC-2	2018-11-14	0.0005	< 0.0006	< 0.01	0.008	0.0272	< 0.00001	0.0012	0.003	< 0.0003	0.0024
ST-WTN-DC-2	2018-11-26	< 0.0005	< 0.0006	< 0.01	0.01	0.0304	< 0.00001	0.001	0.0028	< 0.0003	0.0016
ST-WTN-DC-2	2018-12-13										
ST-WTN-DC-2	2918-12-18										

^CCME Water Quality Guideline for the
 Guidelines for total metals are applied e

*BC MOE guideline: www.env.gov.bc.ca

**short term limit, 25 mg/L above backg

Table C-2. Complete water quality analysis for dike construction monitoring location WTN-DC

Station	Parameter>>	Dissolved Antimony (Sb)	Dissolved Silver (Ag)	Dissolved Tin (Sn)	Dissolved Strontium (Sr)	Dissolved Titanium (Ti)	Dissolved Thallium (Tl)	Dissolved Uranium (U)	Dissolved vanadium (V)	Dissolved Zinc (Zn)
	Units>>	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Guideline^>>						0.0008			0.03
ST-WTN-DC-2	2018-09-03	< 0.0001	< 0.0001	< 0.0001	0.051	< 0.01	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WTN-DC-3	2018-09-17	< 0.0001	< 0.0001	< 0.0001	0.056	< 0.01	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WTN-DC-3	2018-09-24	< 0.0001	< 0.0001	< 0.0001	0.293	< 0.01	< 0.0002	< 0.001	< 0.0005	0.002
ST-WTN-DC-2	2018-10-16	< 0.0001	< 0.0001	< 0.001	< 0.005	< 0.01	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WTN-DC-2	2018-11-14	< 0.0001	< 0.0001	< 0.001	0.206	0.01	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WTN-DC-2	2018-11-26	< 0.0001	< 0.0001	< 0.001	0.252	0.02	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WTN-DC-2	2018-12-13									
ST-WTN-DC-2	2918-12-18									

^CCME Water Quality Guideline for the
 Guidelines for total metals are applied e
 *BC MOE guideline: www.env.gov.bc.ca
 **short term limit, 25 mg/L above backg

Table C-3. QA/QC data for dike construction water quality monitoring station ST-WT-DC-2

Parameters	Units	MDL	12/12/18					12/18/18				
			Trip Blank	Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD	
Conventional Parameters												
pH	pH units	-	5.4	5.47	6.75	6.78	0.4	5.53	6.78	6.82	0.6	
Hardness	mg CaCO ₃ /L	1	<1	<1	11	11	0.0	<1	11	13	16.7	
Total suspended solids	mg/L	1	1	1	1	1	0.0	<1	<1	1	0.0	
Total dissolved solids	mg/L	1	2	<1	27	27	0.0	1	28	29	3.5	
Total organic carbon	mg/L	0.2	<0.2	<0.2	1.7	2.6	41.9	<0.2	2.3	2.2	4.4	
Dissolved organic carbon	mg/L	0.2	<0.2	<0.2	1.7	2.5	38.1	<0.2	2.2	2.1	4.7	
Major Ions												
Alkalinity	mg CaCO ₃ /L	2	5	4	10	10	0.0	4	11	11	0	
Bicarbonate	mg CaCO ₃ /L	2	5	4	10	10	0.0	4	11	11	0	
Carbonate	mg CaCO ₃ /L	2	<2	<2	<2	<2	0.0	<2	<2	<2	0	
Chloride	mg/L	0.5	<0.5	<0.5	7.2	7.3	1.4	<0.5	7.2	7.3	1.4	
Hydroxide	mg CaCO ₃ /L	2	<2	<2	<2	<2	0.0	<2	<2	<2	0	
Sulphate	mg/L	0.6	<0.6	1.3	1.3	3.9	100.0	<0.6	0.9	1.1	20.0	
Silica	mg/L	0.01	<0.01	0.12	0.51	0.45	12.5	<0.01	0.5	0.68	30.5	
Dissolved silica	mg/L	0.01	-	-	-	-	-	<0.01	0.43	0.55	24.5	
Nutrients and Chlorophyll a												
Nitrate	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.0	<0.01	<0.01	<0.01	0.0	
Nitrite	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.0	<0.01	<0.01	<0.01	0.0	
Total Kjeldhal Nitrogen	mg/L	0.05	0.11	0.12	0.14	<0.01	94.7	<0.05	0.15	0.14	6.9	
Ammonia NH ₃	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.0	<0.01	0.01	<0.01	0.0	
Ammonia Nitrogen	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.0	0.02	0.01	0.01	0.0	
Total phosphorus	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.0	<0.01	0.01	0.02	66.7	
Orthophosphate	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.0	<0.01	0.01	0.02	66.7	
Chlorophyll a	ug/L	0.13	0.54	<0.13	0.56	0.54	3.6	<0.13	0.57	0.85	39.4	
Total Metals												
Aluminum	mg/L	0.005	<0.005	<0.0005	<0.005	<0.005	0.0	<0.005	<0.005	<0.005	0.0	
Antimony	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0	<0.0001	<0.0001	<0.0001	0.0	
Arsenic	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0	<0.0005	<0.0005	<0.0005	0.0	
Barium	mg/L	0.0005	<0.0005	<0.0005	0.0061	0.0043	34.6	<0.0005	0.0033	0.0057	53.3	
Beryllium	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0	<0.0005	<0.0005	<0.0005	0.0	
Boron	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.0	<0.01	<0.01	<0.01	0.0	
Cadmium	mg/L	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.0	<0.00002	<0.00002	<0.00002	0.0	
Chromium	mg/L	0.0006	<0.0006	<0.0006	<0.0006	<0.0006	0.0	<0.0006	<0.0006	<0.0006	0.0	
Copper	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0	<0.0005	<0.0005	<0.0005	0.0	
Iron	mg/L	0.01	0.02	<0.01	<0.01	<0.01	0.0	<0.01	<0.01	<0.01	0.0	
Lead	mg/L	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.0	<0.0003	<0.0003	<0.0003	0.0	
Lithium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	0.0	<0.005	<0.005	<0.005	0.0	
Manganese	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0	<0.0005	<0.0005	<0.0005	0.0	
Mercury	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.0	<0.00001	<0.00001	<0.00001	0.0	
Molybdenum	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0	<0.0005	<0.0005	<0.0005	0.0	
Nickel	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0	<0.0005	<0.0005	<0.0005	0.0	
Selenium	mg/L	0.0005	<0.0005	0.0013	<0.0005	<0.0005	0.0	<0.0005	<0.0005	<0.0005	0.0	
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0	<0.0001	<0.0001	<0.0001	0.0	
Strontium	mg/L	0.005	<0.005	<0.005	0.027	0.027	0.0	<0.005	0.031	0.032	3.2	
Thallium	mg/L	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0	<0.0002	<0.0002	<0.0002	0.0	
Tin	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.0	<0.001	<0.001	<0.001	0.0	
Titanium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.0	<0.01	<0.01	<0.01	0.0	
Uranium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.0	<0.001	<0.001	<0.001	0.0	
Vanadium	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0	<0.0005	<0.0005	<0.0005	0.0	

Table C-3. QA/QC data for dike construction water quality monitoring station ST-WT-DC-2

Parameters	Units	MDL	12/12/18					12/18/18				
			Trip Blank	Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD	
Zinc	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0	< 0.001	< 0.001	< 0.001	0.0
Dissolved Metals												
Aluminum	mg/L	0.0005	<0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	< 0.0005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0	< 0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	< 0.0005	< 0.0005	0.0034	0.0039	13.7	< 0.0005	0.0020	0.0026	26.1	
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	< 0.0005	0.0	
Boron	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0	< 0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.0	< 0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0	< 0.0006	< 0.0006	< 0.0006	0.0
Copper	mg/L	0.0005	0.0014	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	< 0.0005	0.0	
Iron	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0	< 0.01	< 0.01	< 0.01	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0	< 0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0	< 0.005	< 0.005	< 0.005	0.0
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	< 0.0005	0.0	
Mercury	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.0	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0	< 0.0005	< 0.0005	< 0.0005	0.0
Nickel	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0	< 0.0005	< 0.0005	< 0.0005	0.0
Selenium	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0	< 0.0005	0.0006	< 0.0005	18.2
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0	< 0.0001	< 0.0001	< 0.0001	0.0
Strontium	mg/L	0.005	<0.005	<0.005	0.026	0.026	0.0	< 0.005	0.026	0.028	7.4	
Thallium	mg/L	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0	< 0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0	< 0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0	< 0.01	< 0.01	< 0.01	0.0
Uranium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0	< 0.001	< 0.001	< 0.001	0.0
Vanadium	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0	< 0.001	< 0.001	< 0.001	0.0

Footnotes:

RPD = Relative Percent Difference; MDL: Method Detection Limit

RPD column key:

Bold values correspond to a RPD higher than 50% and for which concentrations of parent and duplicate samples are less than 10x the MDL.

Grey shaded cells correspond to a RPD higher than 50% and for which concentrations of parent and duplicate samples exceed 10x the MDL.

Italic values correspond to a RPD higher than 50% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Trip and Field Blank columns key:

Bold values correspond to values exceeding the MDL

Table C-4. QA/QC data for dike construction water quality monitoring station ST-WTN-DC

Parameters	Units	MDL	12/12/18					12/30/18		
			Trip Blank	Field Blank	Duplicate	Original	RPD	Duplicate	Original	RPD
Conventional Parameters										
pH	pH units	-	7.19	5.25	6.93	6.91	0.3	6.6	7.03	6.3
Hardness	mg CaCO3/L	1	<1	<1	59	66	11.2	100	89	11.6
Total suspended solids	mg/L	1	1	1	2	1	66.7	1	1	0.0
Total dissolved solids	mg/L	1	30	<1	111	110	0.9	110	109	0.9
Total organic carbon	mg/L	0.2	<0.2	<0.2	1.7	2.9	52.2	2.3	2.3	0.0
Dissolved organic carbon	mg/L	0.2	<0.2	<0.2	1.7	2.7	45.5	2.3	2.2	4.4
Major Ions										
Alkalinity	mg CaCO3/L	2	14	4	15	15	0.0	24	45	60.9
Bicarbonate	mg CaCO3/L	2	14	4	15	15	0.0	24	45	60.9
Carbonate	mg CaCO3/L	2	<2	<2	<2	<2	0.0	<2	<2	0.0
Chloride	mg/L	0.5	<0.5	<0.5	45.2	45.5	0.7	44.9	45	0.2
Hydroxide	mg CaCO3/L	2	<2	<2	<2	<2	0.0	<2	<2	0.0
Sulphate	mg/L	0.6	<0.6	<0.6	5.9	6.2	5.0	6.3	6.7	6.2
Silica	mg/L	0.01	<0.01	<0.01	1.5	1.68	11.3	2.52	2.37	6.1
Nutrients and Chlorophyll a										
Nitrate	mg/L	0.01	<0.01	0.01	0.61	0.62	1.6	0.61	0.61	0.0
Nitrite	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.0	<0.01	<0.01	0.0
Ammonia Nitrogen	mg/L	0.01	<0.01	<0.01	0.29	0.29	0.0	0.22	0.22	0.0
Total Kjeldahl nitrogen	mg/L	0.05	<0.05	<0.05	0.38	0.42	10.0	0.36	0.34	5.7
Ammonia NH3	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.0	<0.01	<0.01	0.0
Total phosphorus	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.0	<0.01	<0.01	0.0
Orthophosphate	mg/L	0.01	0.01	0.01	0.01	<0.01	0.0	<0.01	<0.01	0.0
Chlorophyll a	mg/L	0.00013	<0.00013	<0.00013	0.00059	0.0003	65.2	0.00053	0.00051	3.8
Total Metals										
Aluminum	mg/L	0.005	<0.005	<0.005	0.054	0.071	27.2	0.12	0.106	12.4
Antimony	mg/L	0.0001	<0.0001	<0.0001	0.0002	0.0001	66.7	<0.0001	<0.0001	0.0
Arsenic	mg/L	0.0005	<0.0005	<0.0005	0.0018	0.0017	5.7	0.0029	0.0030	3.4
Barium	mg/L	0.0005	<0.0005	<0.0005	0.0348	0.0394	12.4	0.0562	0.0451	21.9
Beryllium	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0	<0.0005	<0.0005	0.0
Boron	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.0	<0.01	<0.01	0.0
Cadmium	mg/L	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.0	<0.00002	<0.00002	0.0
Chromium	mg/L	0.0006	<0.0006	<0.0006	<0.0006	<0.0006	0.0	0.0007	<0.0006	15.4
Copper	mg/L	0.0005	<0.0005	<0.0005	<0.0005	0.0005	0.0	0.0011	0.0008	31.6
Iron	mg/L	0.01	<0.01	<0.01	0.07	0.08	13.3	0.08	0.08	0.0
Lead	mg/L	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.0	<0.0003	<0.0003	0.0
Lithium	mg/L	0.005	<0.005	<0.005	0.011	0.013	16.7	0.016	0.014	13.3
Manganese	mg/L	0.0005	<0.0005	<0.0005	0.0241	0.0287	17.4	0.0427	0.0358	17.6
Mercury	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.0	<0.00001	<0.00001	0.0
Molybdenum	mg/L	0.0005	<0.0005	<0.0005	0.0025	0.0031	21.4	0.0024	0.0022	8.7
Nickel	mg/L	0.0005	<0.0005	<0.0005	0.0022	0.0026	16.7	0.0036	0.0032	11.8
Selenium	mg/L	0.0005	<0.0005	<0.0005	<0.0005	0.0023	128.6	<0.0005	<0.0005	0.0
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0	<0.0001	<0.0001	0.0
Strontium	mg/L	0.005	<0.005	<0.005	0.244	0.268	9.4	0.328	0.294	10.9
Thallium	mg/L	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0	<0.0002	<0.0002	0.0
Tin	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.0	<0.001	<0.001	0.0
Titanium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.0	<0.01	<0.01	0.0

Table C-4. QA/QC data for dike construction water quality monitoring station ST-WTN-DC

Parameters	Units	MDL	12/12/18					12/30/18			
			Trip Blank	Field Blank	Duplicate	Original	RPD	Duplicate	Original	RPD	
Uranium	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0	< 0.001	< 0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0	0.007	0.004	54.5
Dissolved Metals											
Aluminum	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.005	< 0.0005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	0.0003	< 0.0001	100.0	< 0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0012	0.0011	8.7	0.0025	0.0023	8.3	
Barium	mg/L	0.0005	< 0.0005	< 0.0005	0.029	0.0282	2.8	0.0353	0.0342	3.2	
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	0.0	
Boron	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0	< 0.01	< 0.01	0.0	
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.0	< 0.00002	< 0.00002	0.0	
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0	< 0.0006	< 0.0006	0.0	
Copper	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	0.0005	< 0.0005	0.0	
Iron	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0	< 0.01	< 0.01	0.0	
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0	< 0.0003	< 0.0003	0.0	
Lithium	mg/L	0.005	< 0.005	< 0.005	0.01	0.009	10.5	0.012	0.012	0.0	
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	0.0241	0.0277	13.9	0.0278	0.0358	25.2	
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.0	< 0.00001	< 0.00001	0.0	
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0.0026	0.0028	7.4	0.0019	0.0022	14.6	
Nickel	mg/L	0.0005	< 0.0005	< 0.0005	0.0016	0.0019	17.1	0.0029	0.0023	23.1	
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	0.0	
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0	< 0.0001	< 0.0001	0.0	
Strontium	mg/L	0.005	< 0.005	< 0.005	0.235	0.216	8.4	0.26	0.254	2.3	
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0	< 0.0002	< 0.0002	0.0	
Tin	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0	< 0.001	< 0.001	0.0	
Titanium	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0	< 0.01	< 0.01	0.0	
Uranium	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0	< 0.001	< 0.001	0.0	
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	0.0	
Zinc	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0	< 0.001	< 0.001	0.0	

Footnotes:

RPD = Relative Percent Difference; MDL: Method Detection Limit

RPD column key:

Bold values correspond to a RPD higher than 50% and for which concentrations of parent and duplicate samples are less than 10x the MDL.

Grey shaded cells correspond to a RPD higher than 50% and for which concentrations of parent and duplicate samples exceed 10x the MDL.

Italic values correspond to a RPD higher than 50% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Trip and Field Blank columns key:

Bold values correspond to values exceeding the MDL

Table C-1. Complete water quality analysis for dike construction monitoring location WT-DC.

Station	Parameter>>	pH - field	pH lab	Conductivity - field	Temperature - field	HDO - field	Turbidity - field	Alkalinity Total	Alkalinity bicarbonate	Alkalinity carbonate	Alkalinity hydroxide	Ammonia (NH3)	Chloride (Cl)
	Units>>			µS/cm	C	mg/l	NTU	mg CaCO3/L	mg/L	mg/L	mg/L	mg N/L	mg/L
	Guideline^>>		6.5-9										
ST-WT-DC-3	2018-07-31		6.86					10	10	< 2	< 2	< 0.01	7.2
ST-WT-DC-2	2018-08-07		6.95					13	13	< 2	< 2	< 0.01	6.9
ST-WT-DC-2	2018-08-14		7					14	14	< 2	< 2	< 0.01	6.7
ST-WT-DC-3	2018-08-21		6.95					7	7	< 2	< 2	< 0.01	6.7
ST-WT-DC-3	2018-08-27		6.94					7	7	< 2	< 2		
ST-WT-DC-2	2018-09-03	6.13		38.1	8.34	11.48	0.46	8	8	< 2	< 2	< 0.01	6.4
ST-WT-DC-3	2018-09-17	6.7		37.4		11.83	0.15	7	7	< 2	< 2	< 0.01	6.2
ST-WT-DC-3	2018-09-24	6.58		37.5		13.73	0.15	9	9	< 2	< 2	< 0.01	5.9
ST-WT-DC-2	2018-10-16	7.63	6.95	47.4	9.16	11.23	0.14	9	9	< 2	< 2	< 0.01	7
ST-WT-DC-2	2018-11-14	6.91	6.9	52.7	13.25	11.98	0.65	12	12	< 2	< 2	< 0.01	8.9
ST-WT-DC-2	2018-11-26	7.34	6.9	46.5	4.45	12.9	0	12	12	< 2	< 2	< 0.01	6.7
ST-WT-DC-2	2018-12-12	6.85		40.5	1.48	15.55	0						
ST-WT-DC-2	2018-12-18	6.76		48.6	1.43	16.75	0						

^CCME Water Quality Guideline for the Protection of Aquatic Life, unless otherwise indicated.

Guidelines for total metals are applied equally for dissolved metals, except for Al.

*BC MOE guideline: www.env.gov.bc.ca

**short term limit, 25 mg/L above background (<24 h)

Table C-1. Complete water quality analysis for dike construction monitoring location WT-DC.

Station	Parameter>>	Dissolved organic carbon (DOC)	Hardness	Nitrate	Nitrite	Ortho-phosphate	Phosphorous total	Sulphate (SO2-4)	TDS	TKN (Kjeldahl nitrogen)
	Units>>	mg/L	mg CaCO3/L	mg N/L	mg N/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Guideline^>>			2.9	0.06		0.004			
ST-WT-DC-3	2018-07-31	1.80	12	< 0.01	< 0.01	< 0.01	< 0.01	1.4	32	< 0.05
ST-WT-DC-2	2018-08-07	2.00	13	< 0.01	< 0.01	0.01	NA	1.2	27	NA
ST-WT-DC-2	2018-08-14	2.00	12	< 0.01	< 0.01	0.01	< 0.01	0.9	28	0.07
ST-WT-DC-3	2018-08-21	1.60	13	0.01	< 0.01	< 0.01	< 0.01	0.6	27	< 0.05
ST-WT-DC-3	2018-08-27	2.00					NA		26	
ST-WT-DC-2	2018-09-03	1.90	12	< 0.01	< 0.01	< 0.01	0.0023	1.7	na	na
ST-WT-DC-3	2018-09-17	2.10	16	< 0.01	< 0.01	0.01	< 0.01	0.7	26	0.1
ST-WT-DC-3	2018-09-24	2.00	12	< 0.01	< 0.01	< 0.01	< 0.01	< 0.6	25	0.45
ST-WT-DC-2	2018-10-16	2.10	10	< 0.01	< 0.01	0.01	0.02	1.5	24	0.33
ST-WT-DC-2	2018-11-14	2.50	13	< 0.01	< 0.01	< 0.01	0.03	3.4	30	0.1
ST-WT-DC-2	2018-11-26	1.90	13	< 0.01	< 0.01	< 0.01	< 0.01	1.4	26	0.17
ST-WT-DC-2	2018-12-12									
ST-WT-DC-2	2018-12-18									

^CCME Water Quality Guideline for the Protec
 Guidelines for total metals are applied equally
 *BC MOE guideline: www.env.gov.bc.ca
 **short term limit, 25 mg/L above background

Table C-1. Complete water quality analysis for dike construction monitoring location WT-DC.

Station	Parameter>>	TOC	TSS	Reactive Silicate	Silica (Si)	Chlorophyll A	Aluminum (Al)	Arsenic (As)	Boron (B)	Barium (Ba)	Beryllium (Be)
	Units>>	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Guideline^>>		26 mg/L**				0.1	0.005	1.2*		
ST-WT-DC-3	2018-07-31	2	< 1	NA	0.32	< 0.13	< 0.005	< 0.005	< 0.01	0.0069	< 0.0005
ST-WT-DC-2	2018-08-07	2	1	NA	0.28	NA	0.044	< 0.005	< 0.01	0.0099	< 0.0005
ST-WT-DC-2	2018-08-14	2	< 1	0.78	0.44	0.82	0.075	< 0.005	< 0.01	0.009	< 0.0005
ST-WT-DC-3	2018-08-21	1.9	< 1	NA	0.27		0.023	< 0.005	< 0.01	0.0077	< 0.0005
ST-WT-DC-3	2018-08-27	3.2		NA							
ST-WT-DC-2	2018-09-03	na	na	na	0.27	0.98	0.019	< 0.005	< 0.01	0.0073	< 0.0005
ST-WT-DC-3	2018-09-17	2.1	1	na	0.37	0.55	0.03	< 0.0005	< 0.01	0.008	< 0.0005
ST-WT-DC-3	2018-09-24	2.2	2	na	0.25	1.1	0.013	< 0.0005	< 0.01	0.0059	< 0.0005
ST-WT-DC-2	2018-10-16	2.1	< 1		0.47	1.6	< 0.005	< 0.0005	< 0.01	0.0054	< 0.0005
ST-WT-DC-2	2018-11-14	4	1	na	0.37	3.2	< 0.005	< 0.0005	< 0.1	0.0097	< 0.0005
ST-WT-DC-2	2018-11-26	2.1	1		0.3	1.1	< 0.005	< 0.0005	< 0.01	0.0052	< 0.0005
ST-WT-DC-2	2018-12-12										
ST-WT-DC-2	2018-12-18										

^CCME Water Quality Guideline for the Protec
 Guidelines for total metals are applied equally
 *BC MOE guideline: www.env.gov.bc.ca
 **short term limit, 25 mg/L above background

Table C-1. Complete water quality analysis for dike construction monitoring location WT-DC.

Station	Parameter>>	Cadmium (Cd)	Copper (Cu)	Chromium (Cr)	Iron (Fe)	Lithium (Li)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Lead (Pb)	Selenium (Se)
	Units>>	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L *	mg/L	mg/L	mg/L	mg/L	mg/L
	Guideline^>>	0.00004	0.002	0.001	0.3		0.6578	0.00026	0.073	0.025	0.001	0.001
ST-WT-DC-3	2018-07-31	< 0.00002	< 0.0005	< 0.0006	0.05	< 0.005	0.0032	< 0.00001	< 0.0005	< 0.0005	< 0.0003	< 0.0005
ST-WT-DC-2	2018-08-07	< 0.00002	0.0005	< 0.0006	0.09	0.013	0.0032	< 0.00001	< 0.0005	0.0005	< 0.0003	0.0012
ST-WT-DC-2	2018-08-14	< 0.00002	< 0.0005	0.0009	0.13	< 0.005	0.0041	< 0.00001	< 0.0005	0.0008	0.004	< 0.0005
ST-WT-DC-3	2018-08-21	< 0.00002	< 0.0005	< 0.0006	0.1	< 0.005	0.0026	< 0.00001	< 0.0005	< 0.0005	< 0.0003	< 0.0005
ST-WT-DC-3	2018-08-27											
ST-WT-DC-2	2018-09-03	< 0.00002	0.002	< 0.0006	0.05	0.014	0.0017	< 0.00001	< 0.0005	< 0.0005	< 0.0003	0.0005
ST-WT-DC-3	2018-09-17	< 0.00002	< 0.0005	0.0007	0.04	< 0.005	0.0022	< 0.00001	< 0.0005	0.0011	0.0028	< 0.0005
ST-WT-DC-3	2018-09-24	< 0.00002	0.0006	0.0006	0.03	< 0.005	0.0016	< 0.00001	< 0.0005	0.0009	0.0004	< 0.0005
ST-WT-DC-2	2018-10-16	< 0.00002	< 0.0005	< 0.0006	0.01	< 0.005	0.0009	< 0.00001	< 0.0005	< 0.0005	< 0.0003	< 0.0005
ST-WT-DC-2	2018-11-14	< 0.00002	< 0.0005	< 0.0006	0.69	< 0.005	0.0006	< 0.00001	< 0.0005	0.0007	< 0.0003	0.0005
ST-WT-DC-2	2018-11-26	< 0.00002	< 0.0005	< 0.0006	< 0.01	< 0.005	< 0.0005	< 0.00001	< 0.0005	0.0005	< 0.0003	< 0.0005
ST-WT-DC-2	2018-12-12											
ST-WT-DC-2	2018-12-18											

^CCME Water Quality Guideline for the Protec
 Guidelines for total metals are applied equally
 *BC MOE guideline: www.env.gov.bc.ca
 **short term limit, 25 mg/L above background

Table C-1. Complete water quality analysis for dike construction monitoring location WT-DC.

Station	Parameter>>	Antimony (Sb)	Silver (Ag)	Tin (Sn)	Strontium (Sr)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Dissolved Aluminum (Al)	Dissolved Arsenic (As)
	Units>>	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Guideline^>>						0.0008			0.03	0.05*	0.005
ST-WT-DC-3	2018-07-31	< 0.0001	< 0.0001	< 0.001	0.027		< 0.0002	< 0.001	< 0.0005	< 0.001	< 0.005	< 0.0005
ST-WT-DC-2	2018-08-07	< 0.0001	< 0.0001	< 0.001	0.031		0.0002	< 0.001	< 0.0005	< 0.001	< 0.005	< 0.0005
ST-WT-DC-2	2018-08-14	< 0.0001	< 0.0001	< 0.001	0.031		< 0.0002	< 0.001	< 0.0005	< 0.001	< 0.005	< 0.0005
ST-WT-DC-3	2018-08-21	< 0.0001	< 0.0001	< 0.001	0.028		< 0.0002	< 0.001	< 0.0005	< 0.001	< 0.005	< 0.0005
ST-WT-DC-3	2018-08-27											
ST-WT-DC-2	2018-09-03	< 0.0001	< 0.0001	< 0.001	0.027	< 0.01	< 0.0002	< 0.001	< 0.0005	0.002	< 0.005	< 0.0005
ST-WT-DC-3	2018-09-17	< 0.0001	< 0.0001	< 0.001	0.031	< 0.01	< 0.0002	< 0.001	< 0.0005	0.002	< 0.005	< 0.0005
ST-WT-DC-3	2018-09-24	< 0.0001	< 0.0001	< 0.001	0.024	< 0.01	< 0.0002	< 0.001	< 0.0005	< 0.001	0.012	< 0.0005
ST-WT-DC-2	2018-10-16	< 0.0001	< 0.0001	< 0.001	< 0.005	< 0.01	< 0.0002	< 0.001	< 0.0005	< 0.001	< 0.0005	< 0.0005
ST-WT-DC-2	2018-11-14	< 0.0001	< 0.0001	< 0.001	0.031	< 0.01	< 0.0002	< 0.001	< 0.0005	< 0.001	< 0.005	< 0.0005
ST-WT-DC-2	2018-11-26	< 0.0001	< 0.0001	< 0.001	0.03	< 0.01	< 0.0002	< 0.001	< 0.0005	< 0.001	< 0.005	< 0.0005
ST-WT-DC-2	2018-12-12											
ST-WT-DC-2	2018-12-18											

^CCME Water Quality Guideline for the Protec
 Guidelines for total metals are applied equally
 *BC MOE guideline: www.env.gov.bc.ca
 **short term limit, 25 mg/L above background

Table C-1. Complete water quality analysis for dike construction monitoring location WT-DC.

Station	Parameter>>	Dissolved Boron (B)	Dissolved Barium (Ba)	Dissolved Beryllium (Be)	Dissolved Cadmium (Cd)	Dissolved Copper (Cu)	Dissolved Chromium (Cr)	Dissolved Iron (Fe)	Dissolved Lithium (Li)	Dissolved Manganese (Mn)
	Units>>	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L*
	Guideline^>>				0.00004		0.001	0.3		0.6578
ST-WT-DC-3	2018-07-31	< 0.01	0.0069	< 0.0005	< 0.00002	< 0.0005	< 0.0006	< 0.01	< 0.005	< 0.0005
ST-WT-DC-2	2018-08-07	< 0.01	0.0054	< 0.0005	< 0.00002	< 0.0005	< 0.0006	< 0.01	< 0.005	< 0.0005
ST-WT-DC-2	2018-08-14	< 0.01	0.0071	< 0.0005	< 0.00002	< 0.0005	< 0.0006	0.01	< 0.005	0.0009
ST-WT-DC-3	2018-08-21	< 0.01	0.0051	< 0.0005	< 0.00002	0.0008	< 0.0006	< 0.01	< 0.005	0.0007
ST-WT-DC-3	2018-08-27									
ST-WT-DC-2	2018-09-03	< 0.01	0.067	< 0.0005	< 0.00002	< 0.0005	< 0.0006	< 0.01	< 0.005	< 0.0005
ST-WT-DC-3	2018-09-17	< 0.01	0.0054	< 0.0005	< 0.00002	< 0.0005	< 0.0006	< 0.01	< 0.005	< 0.0005
ST-WT-DC-3	2018-09-24	< 0.01	0.0078	< 0.0005	< 0.00002	0.0008	< 0.0006	< 0.01	< 0.005	< 0.0005
ST-WT-DC-2	2018-10-16	< 0.01	0.0044	< 0.0005	0.00006	< 0.0005	< 0.0006	< 0.01	< 0.005	< 0.0005
ST-WT-DC-2	2018-11-14	< 0.01	0.0076	< 0.0005	< 0.00002	0.0086	< 0.0006	< 0.01	< 0.005	0.0005
ST-WT-DC-2	2018-11-26	< 0.01	0.0046	< 0.0005	< 0.00002	< 0.0005	< 0.0006	< 0.01	< 0.005	< 0.0005
ST-WT-DC-2	2018-12-12									
ST-WT-DC-2	2018-12-18									

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 Guidelines for total metals are applied equally
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 **short term limit, 25 mg/L above background

Table C-1. Complete water quality analysis for dike construction monitoring location WT-DC.

Station	Parameter>>	Dissolved Mercury (Hg)	Dissolved Molybdenum (Mo)	Dissolved Nickel (Ni)	Dissolved Lead (Pb)	Dissolved Selenium (Se)	Dissolved Antimony (Sb)	Dissolved Silver (Ag)	Dissolved Tin (Sn)	Dissolved Strontium (Sr)	Dissolved Titanium (Ti)
	Units>>	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Guideline^>>	0.00026	0.073	0.025	0.001	0.001					
ST-WT-DC-3	2018-07-31	< 0.00001	< 0.0005	< 0.0005	< 0.0003	< 0.0005	< 0.0001	< 0.0001	< 0.001	0.029	
ST-WT-DC-2	2018-08-07	< 0.00001	< 0.0005	< 0.0005	< 0.0003	0.0007	0.0013	< 0.0001	< 0.001	0.033	
ST-WT-DC-2	2018-08-14	< 0.00001	< 0.0005	< 0.0005	< 0.0003	< 0.0005	< 0.0001	< 0.0001	< 0.001	0.034	
ST-WT-DC-3	2018-08-21	< 0.00001	< 0.0005	< 0.0005	< 0.0003	0.0009	< 0.0001	< 0.0001	< 0.001	0.027	
ST-WT-DC-3	2018-08-27										
ST-WT-DC-2	2018-09-03	< 0.00001	< 0.0005	< 0.0005	< 0.0003	< 0.0005	< 0.0001	< 0.0001	< 0.001	0.027	< 0.01
ST-WT-DC-3	2018-09-17	< 0.00001	< 0.0005	< 0.0005	< 0.0003	< 0.0005	< 0.0001	< 0.0001	< 0.001	0.025	< 0.01
ST-WT-DC-3	2018-09-24	< 0.00001	< 0.0005	0.0007	< 0.0003	< 0.0005	< 0.0001	< 0.0001	< 0.001	0.027	0.01
ST-WT-DC-2	2018-10-16	< 0.00001	< 0.0005	< 0.0005	< 0.0003	< 0.0005	< 0.0001	< 0.0001	< 0.001	< 0.005	< 0.01
ST-WT-DC-2	2018-11-14	< 0.00001	< 0.0005	0.0008	< 0.0003	0.0009	< 0.0001	< 0.0001	< 0.001	0.032	< 0.01
ST-WT-DC-2	2018-11-26	< 0.00001	< 0.0005	< 0.0005	< 0.0003	< 0.0005	< 0.0001	< 0.0001	< 0.001	0.029	< 0.01
ST-WT-DC-2	2018-12-12										
ST-WT-DC-2	2018-12-18										

^CCME Water Quality Guideline for the Protec
 Guidelines for total metals are applied equally
 *BC MOE guideline: www.env.gov.bc.ca
 **short term limit, 25 mg/L above background

Table C-1. Complete water quality analysis for dike construction monitoring location WT-DC.

Station	Parameter>>	Dissolved Thallium (Tl)	Dissolved Uranium (U)	Dissolved vanadium (V)	Dissolved Zinc (Zn)
	Units>>	mg/L	mg/L	mg/L	mg/L
	Guideline^>>	0.0008			0.03
ST-WT-DC-3	2018-07-31	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WT-DC-2	2018-08-07	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WT-DC-2	2018-08-14	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WT-DC-3	2018-08-21	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WT-DC-3	2018-08-27				
ST-WT-DC-2	2018-09-03	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WT-DC-3	2018-09-17	< 0.0002	< 0.001	< 0.0005	0.002
ST-WT-DC-3	2018-09-24	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WT-DC-2	2018-10-16	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WT-DC-2	2018-11-14	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WT-DC-2	2018-11-26	< 0.0002	< 0.001	< 0.0005	< 0.001
ST-WT-DC-2	2018-12-12				
ST-WT-DC-2	2018-12-18				

^CCME Water Quality Guideline for the Protec
 Guidelines for total metals are applied equally
 *BC MOE guideline: www.env.gov.bc.ca
 **short term limit, 25 mg/L above background

APPENDIX D

MDMER Monitoring Results for Construction Dewatering Discharge

Table D-1. 2018 Whale Tail North Basin MDMER Effluent Monitoring (ST-MDMER-4)

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
January											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
February											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
March											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
April											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
May											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
June											
NDEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NDEP
NDEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NDEP
NDEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NDEP
NDEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NDEP
July											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
Week July 29 to August 4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
August											
6-Aug-18	< 0.0005	< 0.0005	NA1	< 0.0003	0.0006	< 0.001	NA1	NA1	6.60	NMR	NMR
9-Aug-18	< 0.0005	0.0008	0.001	< 0.0003	< 0.0005	< 0.001	< 1	0.003	6.98	NMR	NMR
14-Aug-18	< 0.0005	0.0030	< 0.001	0.0014	0.0017	0.015	7	0.006	7.25	0	0
20-Aug-18	< 0.0005	0.0008	< 0.001	< 0.0003	0.0012	< 0.001	4	0.005	7.03	NMR	NMR
27-Aug-18	< 0.0005	0.0013	< 0.001	0.0023	0.0018	< 0.001	6	0.004	7.11	NMR	NMR
September											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP

Table D-1. 2018 Whale Tail North Basin MDMER Effluent Monitoring (ST-MDMER-4)

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
October											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
November											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
December											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP

NDEP :No Deposit

NMR: No Measurement Required

* Discharge from July 27 to August 27, 2018

NA: As required by MDMER Division 2 Section 12(1), Agnico Eagle did not collect for the week of July 29th to August 4th, 2018 a sample of effluent from the final discharge point. Agnico didn't record the pH and the concentrations of the deleterious substances prescribed in Section 3 for this week. As the discharge started on July 27th there is no sample taken before this week. Analyses of the MDMER data for the following week were all below the authorized limits of deleterious substances. Notification sent to ECCC Inspector on September 06, 2018.

NA1: The weekly sample required by Division 2 Section 12(1) were not analysed for the Cyanide, TSS and Radium 226. When Agnico noticed this error, another sample was taken on August 9th (in the same week) for all parameters required in Division 2 Section 3. Notification sent to ECCC Inspector on September 06, 2018