



Windsor Bridge Replacement Project

**Construction and operational water quality monitoring report: October 2020 to September
2021**

Final

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Transport for New South Wales



Windsor Bridge Replacement Project

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Contents

1.	Introduction.....	1
1.1	The project.....	1
1.2	Project approval	1
1.3	Purpose of this report	1
1.4	Information about this report	2
2.	Methodology.....	3
2.1	Monitoring sites.....	3
2.2	Monitoring parameters.....	4
2.3	Water quality analysis	8
2.4	Monitoring frequency and duration	8
2.4.1	Surface water	8
2.4.2	Groundwater	8
2.5	Rainfall records.....	9
3.	Results	10
3.1	Prevailing climatic conditions.....	10
3.2	Summary of main activities.....	10
3.3	Water quality control measures	11
3.4	Limitations.....	11
3.5	Summary of results	12
3.6	Discussion	12
3.6.1	Surface water	12
3.6.2	Groundwater	16
3.6.3	Project response to water quality results	18
3.6.4	Monitoring program improvement recommendations	18

Appendix A. Monitoring Locations

Appendix B. Rainfall Records

Appendix C. Surface and groundwater data summary

Appendix D. Surface and Groundwater Relevant Plots

1. Introduction

1.1 The project

The Windsor Bridge Replacement Project involved a new road bridge over the Hawkesbury River at Windsor. The existing bridge over the Hawkesbury River required replacement as it did not meet the current engineering and road design standards.

The following key features have been implemented as part of the Project:

- Construction of a new bridge over the Hawkesbury River at Windsor, approximately 35 metres downstream of the existing Windsor Bridge.
- Construction of new approach roads and intersections to connect the new bridge to the existing road network.
- Modifications to local road and access arrangement including a shared pedestrian/cycle pathway for access to and across the new bridge.
- Removal and backfilling of the existing bridge approach roads.
- Demolition and removal of the existing road bridge, known as Windsor Bridge.
- Urban design and landscaping works, including within the parkland area of Thompson Square and adjacent to the norther intersection of Wilberforce Road, Freemans Reach Road and Macquarie Park access road.
- Ancillary works such as public utility adjustments, water management measures and scour protection works as required.

1.2 Project approval

The Instrument of Approval was granted by the Minister for Planning and Infrastructure on 20 December 2013 for the Windsor Bridge Replacement Project. The approval includes the following condition with respect to Soil and Water Quality:

Condition C24 – Water Quality Monitoring Program: *The applicant shall prepare and implement a **Water Quality Management Program (WQMP)** to monitor and minimise the impacts of the project on surface and groundwater quality and resources and wetlands, during construction and operation of the proposed Windsor Bridge, and demolition of the existing bridge. The program shall be developed in consultation with the office of Environment and Heritage (OEH), Environment Protection Authority (EPA), Department of Primary Industries (DPI) Fishing and Aquaculture and NOW (currently Department of Industry).*

1.3 Purpose of this report

The WQMP was developed in response to the Minister for Planning and Infrastructure approval granted on 20 December 2013 which detailed a condition (C24) that a Water Quality Management Program must be developed and implemented. The WQMP outlines the monitoring and assessment requirements for pre-construction, construction and post construction surface and groundwater quality and levels.

This report addresses the final two months of construction (01 October to 04 December 2020) and the first 10 months of operation between 05 December 2020 and 30 September 2021 and the demolition of the old bridge between August 2020 and April 2021 of surface and groundwater quality and level monitoring requirements outlined in Chapter 5 and Chapter 6/7 of the WQMP, which include, but are not limited to:

- Undertaking monthly surface water and quarterly groundwater quality sampling and at other intervals (wet weather) during the operation of the project.
- Updating baseline reference and upstream site data with collected data and recalculate trigger values.
- Collecting and analysing representative surface water samples for physical and chemical water quality indicators during dry and wet weather.
- Collecting and analysing representative groundwater samples for physical water quality indicators every quarter.
- Quarterly collecting and reporting of groundwater levels at the three groundwater piezometer locations for the duration of the active construction phase and during the operation phase.
- Comparing surface water sampling results with corresponding site specific trigger values (SSTV).
- Comparing upstream and downstream surface water sampling results to evaluate and determine whether any changes and/or impacts on water quality might be attributable to operation.
- Comparing groundwater quality data with corresponding baseline trigger values developed from baseline monitoring.
- Identification of any impacts that the operation of the new bridge is having on surface water and groundwater quality and groundwater levels.
- Providing an assessment of water quality control measures in place

1.4 Information about this report

The findings presented in this report are professional opinions based solely upon information and data provided by Transport or NSW (previously Roads and Maritime Service) or otherwise available in the public domain. Results have been reported based on field assessment during the 2020-2021 construction, demolition and operational monitoring periods however physical and environmental conditions may exist that are beyond the scope of our investigations and this report.

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2. Methodology

The Secretary approved method for surface and groundwater quality/level monitoring is outlined in detail in the WQMP. This chapter provides a summary of key elements of the program.

2.1 Monitoring sites

The location of the proposed works to the Hawkesbury River means that there is the potential to directly impact on surface water during the construction and operation of the new bridge and demolition of the existing bridge. As such, surface water quality monitoring sites were selected to ensure potential impacts from the project could be identified early so measures can be implemented to mitigate impacts where necessary.

The construction phase of Windsor Bridge Replacement presents a low risk to groundwater through interference with local groundwater aquifer and/or contamination of groundwater from hazardous liquid spills.

Monitoring locations were identified for surface quality and groundwater quality/level monitoring during pre-construction, construction, demolition and operation. Additionally, control sites for surface water quality monitoring were selected to monitor during wet weather. Table 2-1 lists the surface and groundwater sites that were monitored as part of the construction phase (NC) between 1 October and 4 December 2020 and operational phase (NO) between 5 December 2020 and 30 September 2021. All surface water sites are within the Hawkesbury River.

Table 2-1 Water quality monitoring locations (Construction (NC) and Operational (NO))

Water Type	Monitoring site	WQMP site nomenclature	Project Phase	Description and location details
Groundwater	North Bank Borehole 2	NC-BH02 NO-BH02	Construction, Decommissioning and Operation	2 adjacent wells located on northern bank. Well A is 6 – 12m deep and targets shallow alluvial material whilst Well B is 19 – 25m deep and targets the deep alluvial material
	South Bank Borehole 1	SC-BH01 SO-BH01	Construction, Decommissioning and Operation	South bank, screened at base of alluvium layer.

Water Type	Monitoring site	WQMP site nomenclature	Project Phase	Description and location details
	Reference borehole	NC-RBH01 NO-RBH01 Referred to as NC-RBH01A & B on Figure A.1.	All Phases.	As per the pre-construction monitoring report, a new reference borehole with monitoring at the Alluvial layer and the Permian layer was drilled and the original reference borehole (RBH01) was not monitored post-preconstruction. The new reference borehole has two monitoring levels and is located in the stockpile yard north of Wilberforce Road. NO-RBH01S is 12 m deep and targets the alluvial layer. NO-RBH01D is 25m deep and targets the Permian bedrock layer.
Surface water	Reference site 1	NC-RS50 NO-RS50	All Phases.	North bank, 50m upstream of existing bridge and upstream of control site (NC-CS1/NO-CS1)
	Reference site 2	SC-RS100 SO-RS100	All Phases.	South bank, 100m upstream of existing bridge and upstream of control site (SC-CS2/SO-CS2)
	Impact site 3	NC-IS50DS NO-IS50DS	All Phases.	North bank 50m downstream of proposed bridge
	Impact site 4	SC-IS50DS SO-IS50DS	All Phases.	South bank 50m downstream of proposed bridge
	Control Site 1	NC-CS1 NO-CS1	All Phases.	North bank stormwater outlet upstream of existing bridge (wet weather only)
	Control Site 2	SC-CS2 SO-CS2	All Phases.	South bank stormwater outlet upstream of existing bridge (wet weather only)

A figure of the surface and groundwater monitoring locations sampled during the operation of the project is provided in Appendix A.

2.2 Monitoring parameters

Water quality monitoring parameters were selected with consideration of:

- RTA's *Guideline for Construction Water Quality Monitoring* (RTA, nd)
- DPI (Water) Standard suite of analytes with additional analytes included based on what is expected to be potentially modified by the project.

Surface water quality included both field parameters and laboratory analysis and groundwater included field parameters only. The analytical suite is presented in Table 2-2. Additional information on monitoring parameters is provided in the WQMP.

Table 2-2 Water quality monitoring parameters

Parameter type	Surface (SW) or groundwater (GW)	Parameter	Unit of measurement	Analysis method
Chemical properties	SW and GW	pH	pH Units	Field measurement
Chemical properties	SW and GW	Dissolved oxygen (DO)	% saturation	Field measurement
Physical properties	SW and GW	Turbidity	NTU	Field measurement
Physical properties	SW and GW	Temperature	°C	Field measurement
Physical properties	SW and GW	Electrical conductivity	mS/cm	Field measurement
Physical properties	SW and GW	Salinity	ppt	Field measurement
Physical properties	SW and GW	Redox Potential	mV	Field measurement
Physical properties	SW	Total suspended solids (TSS)	mg/L	Laboratory measurement
Physical properties	SW	Total dissolved solids (TDS)	mg/L	Laboratory measurement
Major anions	SW	- Chloride (Cl) - Sulfate (SO₄) - Bicarbonate (HCO₃)	mg/L	Laboratory measurement
Major cations	SW	- Calcium (Ca) - Magnesium (Mg) - Sodium (Na) - Potassium (K)	mg/L	Laboratory measurement
Dissolved metals	SW	Dissolved metals - Aluminium (Al) - Antimony (Sb) - Arsenic (As) - Barium (Ba) - Boron (B) - Cadmium (Cd) - Chromium (Cr) - Copper (Cu) - Iron (Fe) - Lead (Pb) - Lithium (Li) - Manganese (Mn) - Mercury (Hg) - Nickel (Ni) - Selenium (Se) - Silver (Ag) - Zinc (Zn)	mg/L	Laboratory measurement
Nutrients	SW	Total nitrogen (TN)	mg/L	Laboratory measurement
	SW	Total phosphorus (TP)	mg/L	Laboratory measurement

Parameter type	Surface (SW) or groundwater (GW)	Parameter	Unit of measurement	Analysis method
Organochlorine Pesticides (OC)	SW	Organochlorine Pesticides (OC) - alpha-BHC - Hexachlorobenzene (HCB) - beta-BHC - gamma-BHC - delta-BHC - Heptachlor - Aldrin - Heptachlor epoxide - trans-Chlordane - alpha-Endosulfan - cis-Chlordane - Dieldrin - 4,4'-DDE - Endrin - beta-Endosulfan - 4,4'-DDD - Endrin aldehyde - Endosulfan sulfate - 4,4'-DDT - Endrin ketone - Methoxychlor - Total Chlordane (sum) - Sum of DDD + DDE + DDT - Sum of Aldrin + Dieldrin	µg/L	Laboratory measurement
Organophosphorus Pesticides (OP)	SW	Organophosphorus Pesticides (OP) - Dichlorvos - Demeton-S-methyl - Monocrotophos - Dimethoate - Diazinon - Chlorpyrifos-methyl - Parathion-methyl - Malathion - Fenthion - Chlorpyrifos - Parathion - Pirimphos-ethyl - Chlorfenvinphos - Bromophos-ethyl - Fenamiphos - Prothiofos - Ethion - Carbophenothion - Azinphos Methyl	µg/L	Laboratory measurement

Parameter type	Surface (SW) or groundwater (GW)	Parameter	Unit of measurement	Analysis method
Polynuclear aromatic hydrocarbons (PAHs)	SW	Polynuclear aromatic hydrocarbons (PAHs) - Naphthalene - Acenaphthylene - Acenaphthene - Fluorene - Phenanthrene - Anthracene - Fluoranthene - Pyrene - Benz(a)anthracene - Chrysene - Benzo(b+j)fluoranthene - Benzo(k)fluoranthene - Benzo(a)pyrene - Indeno(1.2.3.cd)pyrene - Dibenzo(a,h)anthracene - Benzo(g,h,i)perylene - Sum of polycyclic aromatic hydrocarbons - Benzo(a)pyrene TEQ (zero)	µg/L	Laboratory measurement
BTEXN	SW	BTEXN - Benzene - Toluene - Ethylbenzene - meta- & para-Xylene - ortho-Xylene - Total Xylenes - Sum of BTEX - Naphthalene	µg/L	Laboratory measurement
Total Petroleum Hydrocarbons	SW	Total Petroleum Hydrocarbons - C6 - C9 Fraction - C10 - C14 Fraction - C15 - C28 Fraction - C29 - C36 Fraction - C10 - C36 Fraction (sum)	µg/L	Laboratory measurement
Total Recoverable Hydrocarbons	SW	Total Recoverable Hydrocarbons - C6 - C10 Fraction - C6 - C10 Fraction minus BTEX (F1) - >C10 - C16 Fraction - >C16 - C34 Fraction - >C34 - C40 Fraction - >C10 - C40 Fraction (sum) - >C10 - C16 Fraction minus Naphthalene (F2)	µg/L	Laboratory measurement

Parameter type	Surface (SW) or groundwater (GW)	Parameter	Unit of measurement	Analysis method
Groundwater levels	GW	Groundwater levels	Metres below top of casing	Field measurement by dip meter and continually monitored using dataloggers at hourly intervals, with data downloaded monthly.

2.3 Water quality analysis

Depending on the parameter, the analysis of surface water quality can be undertaken in one of two ways. Some physical and chemical properties due to their rapid degradation are analysed in the field as identified in Table 2-2. Field monitoring was performed *in situ* using a calibrated Horiba Water Quality Meter (October 2020 to July 2021) and Hydrolab Water Quality meter and Hach Turbidimeter from August 2021 onwards. The water quality meters were calibrated prior to each sampling event.

Laboratory analysis was undertaken using the NATA accredited laboratory ALS. Samples were collected on-site in laboratory supplied pre-sterilised sample bottles and preserved on ice during transport to the laboratory. A chain of custody form was completed on each sampling trip to keep track of samples from the field, to the laboratory and then to the database.

Groundwater monitoring consisted of field analysis of physical and chemical properties (outlined in Table 2-2) only. Data from groundwater level datalogger was downloaded in the field.

2.4 Monitoring frequency and duration

2.4.1 Surface water

As per the WQMP, during the construction and operational surface water quality monitoring phase, sampling of all parameters provided in Table 2-2 are required to be undertaken for one dry and one wet weather event per month. A wet-weather event is defined as more than 20 millimetres of rainfall within a 24-hour period. Sampling for a wet weather event must commence within 24 hours of the cessation of that rainfall.

Construction phase monitoring commenced on the 31 October 2018 and continued on a monthly basis up until March 2021 when demolition of the original bridge was completed. Decommissioning of the original Windsor Bridge commenced in September 2020 and was completed in March 2021. The new bridge was open to traffic in May 2020 and operational monitoring is ongoing until December 2021. The ongoing requirements for construction, operation and decommissioning monitoring are detailed in the WQMP and will be outlined in subsequent monitoring reports.

2.4.2 Groundwater

There are three groundwater bores monitored as part of the construction operational phase, one reference borehole and two boreholes within the construction and operational footprint. The reference borehole (NO-RBH01) is a paired site and monitors two geological formations – the alluvial layer (NO-RBH01S) and the Permian bedrock layer (NO-RBH01D). The boreholes within the construction and operational footprint are located on the north and south bank of the river and are referred to as impact sites. The borehole on the north bank NO-BH02 is a paired site and monitors two geological formations – the alluvial layer (NO-BH02S) and the Permian bedrock layer (NC-BH02D). The borehole on the south bank SO-BH01 monitors the alluvial layer.

Both boreholes (which were also sampled during construction) were relocated from the pre-construction phase as they were situated within the footprint of the new Windsor Bridge. Boreholes NO-BH02S and NO-BH02D

replaced the north bank borehole NP-NH02 (sacrificial) and was built approximately 125 metres east of the sacrificial borehole location. SO-BH01 replaced the south bank borehole SP-BH01 (sacrificial) and was built approximately 50 metres east of the sacrificial borehole location (See Figure A 1). As of April 2021, this south bank borehole has not been sampled refer Section 0. The preconstruction data however was be used to determine any changes to groundwater quality during construction.

In-situ groundwater quality sampling was undertaken quarterly at the same time as surface water quality using a water quality probe. Hydrasleeves were installed at boreholes NC-RBH01 and NC-BH02 and therefore these boreholes did not require purging prior to sampling. There is insufficient water to use a hydrasleeve at SCBH01 and therefore sampling of this bore consist of purging dry, leaving for a few hours and then sampling.

Groundwater levels were continually monitored using installed dataloggers as hourly intervals, with data downloaded quarterly.

2.5 Rainfall records

During the construction and operational phase monitoring period (October 2020 to September 2021), rainfall records were obtained from the Bureau of Meteorology (BoM) gauge at Richmond RAAF NSW – Station No. 067105. Rainfall records for this are provided in Appendix B.

3. Results

3.1 Prevailing climatic conditions

Rainfall during the past 12 months was variable with above average annual rainfall recorded in five of the past 12 months which included October and December 2020 and March, May and August 2021. The remaining seven months recorded rainfall that was less than long term (1993 to 2021) average monthly rainfall. These months with below average rainfall (with the exception of February 2021) did not record enough rainfall to undertake wet weather monitoring.

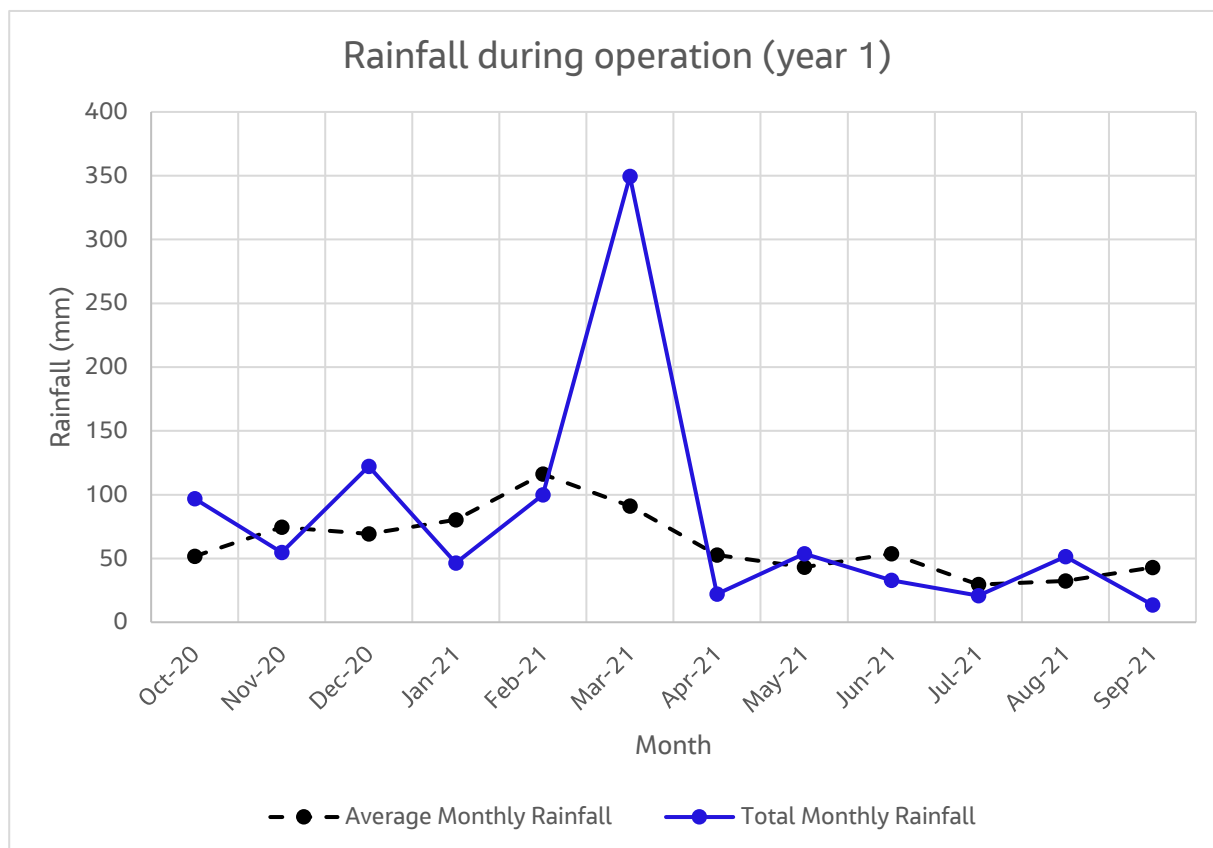


Figure 3-1 Average monthly rainfall compared to total monthly rainfall during the first year of operation as recorded at Richmond RAAF Weather Station (Source: NSW BOM, 2021)

3.2 Summary of main activities

Activities across the project over the last 12 months with the potential to impact on surface and groundwater quality included:

- Placement of asphalt and expose stone pavements
- Line marking across the project
- Completion of minor repair works to kerb and bridge barriers
- Completion services and commissioning of new traffic lights at the George and Bridge Street intersection
- Landscaping across site including Thompson Square parkland
- Commence rehabilitation works to Macquarie Park
- Complete removal of the old Windsor Bridge (demolition commenced in August 2020 and ceased in April 2021)

- Commenced refurbishment and construction of the southern and northern viewing platforms
- Continue placement of scour rocks along the embankment of work area
- Flood recovery works to allow construction to recommence
- Removal of debris underside of bridge deck following the flood event.
- Operation of the water quality basin
- Operation of the new Windsor Bridge

3.3 Water quality control measures

Water quality control measures have been implemented to protect the water quality of the Hawkesbury River during the construction and operation of the Windsor Bridge. Water quality control measures for construction were outlined in Erosion and Sediment Control Plans (ESCPs) and included:

- Separation of offsite and onsite water
- Installation of temporary erosion and sediment controls (sediment fences, mulch bunds, sandbags) including those installed prior to disturbance
- Stockpile management (including diversion bank upslope, sediment fence downslope and temporary vegetation)
- Runoff control including earth bunds, silt curtains, geofab lined drains
- Dust control

For operation of the bridge water quality measures include an operational water quality basin on the northern side that collects road runoff and stormwater from the bridge scupper before it overflows to the Hawkesbury River.

3.4 Limitations

- Significant rainfall occurred between 19 and 22 March 2021 (288 mm) resulting in extremely high water levels. The river was inaccessible and unable to be sampled within 24 hours of the event for safety reasons. Therefore, this wet weather event was not monitored
- A number of wet weather events were not captured during the past 12 months. Sufficient rainfall fell on 22 and 29 December 2020 and on 7 May 2021, however the December rainfall events were not captured as the site was closed for the Christmas and New Year break. The rainfall event in May 2021 was not captured due to lack of devices and watercraft to collect samples. DPIE were notified and a non-conformance was issued.
- Dry weather monitoring was not undertaken in October and December 2020 as monitoring was scheduled for the end of the month, however rainfall fell at the end of these months preventing sampling from being classified as dry. Sampling opportunities were limited in December as the site shutdown occurred on the 18 December 2020.
- Additional monitoring upstream and downstream of the demolition work area (Macquarie Park) was undertaken during demolition of the original Windsor Bridge. Monitoring at these sites occurred on the 17th, 19th and 26th November 2020, 19th January 2021, 10th and 26th February 2021 and the 5th March and 19th April 2021. Refer to Figure 3-2.



Figure 3-2 Demolition monitoring sites

- Where a concentration of a particular parameter is found to be less than the limit of reporting (LOR), the LOR value is used as a conservative assumption.
- The 80th and 20th percentile trigger values are recalculated following each sampling event during dry weather for reference sites to incorporate pre-construction, construction and ongoing operational monitoring results. The ANZG (2018) recommend a minimum of 24 sampling events required to determine site specific trigger values (SSTV). For dry weather there have now been a total of 33 sampling events used in deriving the SSTV up until September 2021. There is insufficient wet weather events to determine SSTVs for wet weather.
- Water level data for NC-BH02A (the shallower one of the pair NC-BH02A/B) could not be downloaded in September 2021. The logger was snagged down the hole, possibly buried in silt and obstructed in some other way and despite many attempts to free the cord it remained stuck.
- At the time of reporting SO-BH01 could not be located to sample and download water level data as borehole is now under pavement and unable to be accessed for monitoring. Therefore data is only reported up to May 2021 for this bore.

3.5 Summary of results

Appendix C and Appendix D provide a summary of results for surface water and groundwater quality. Groundwater level results are provided in Appendix E.

3.6 Discussion

3.6.1 Surface water

Based on the construction and operational water quality monitoring program undertaken between October 2020 and September 2021, the following observations with respect to surface water can be made:

Dry weather

- pH - pH levels at all sites on both the north and south bank of the Hawkesbury River complied with the ANZG (2018) guidelines of 6.5-8.5 for protection of aquatic ecosystems.

pH levels at the north bank were rarely within the pre-construction SSTVs of 7.42-7.65, but were generally within the reference sites SSTVs with the exception of November 2020 and February 2021. In November 2020, the pH of the upstream site NC-IS10US was higher than the 80th percentile SSTV but was the same the reference site pH at that time. In February 2021, the pH levels at all three impact sites exceeded the 80th percentile reference site SSTV due to pH levels of 7.81, 7.64 and 7.57. At the time the pH of the reference site was 7.4, however, despite the higher pH levels at impact sites on this occasion, levels remain within the ANZG (2018) recommended range so as to not negatively impact on water quality.

pH levels on the south bank were within the pre-construction SSTVs of 6.95-7.53 on all sampling occasions. When compared to the reference site SSTVs for the same time period (October 2020 to September 2021), pH levels of the impact sites were generally within the 20th and 80th percentile with the exception of January and September 2021 when pH was recorded below the 20th percentile. Despite the slightly lower pH on these occasions, levels were still within the ANZG (2018) recommended range so did not negatively impact on water quality.

- Turbidity - turbidity at the north bank during dry weather was fairly consistent between the reference and impact sites, however, did exceed the pre-construction SSTVs on four sampling occasions. Despite the higher recordings of turbidity at the impact sites, it was similar to the reference site and below the 80th percentile upper limit.

Turbidity at the south bank showed greater variation in levels between sampling events and between sites. Turbidity was often recorded above the construction SSTVs particularly between April and July 2021 when higher turbidity readings were recorded. On two occasions the upstream impact site SC-IS10US recorded higher turbidity than other sites, however the higher levels appear to be localised (~5NTU higher than corresponding reference site and ~7-10NTU higher than downstream impact sites).

- Dissolved oxygen – dissolved oxygen levels (80th and 20th percentile) at the reference site on the north bank fell outside the pre-construction SSTVs. Dissolved oxygen saturation levels on the north bank were generally similar between impact and reference sites with the exception of November 2020 and February and March 2021. In November 2020, dissolved oxygen was notably higher (~20% saturation) at the most downstream impact sites NC-IS50DS. Similarly in February and March 2021 the upstream impact site NC-IS10US had lower levels when compared to the reference site (~26% saturation and ~14% saturation in February and March respectively). As the dissolved oxygen variation was isolated to particular sites it is unlikely that the instance of higher DO in November and lower DO in February and March are the result of the construction or operation of the project.

Dissolved oxygen concentrations on the south bank also did not fall within the preconstruction SSTVs but were more compliant with the ANZG (2018) recommended limits for protection of aquatic ecosystems. This was generally due to higher dissolved oxygen concentrations recorded over the past 12 months. Concentrations between the impact sites were similar to the reference sites throughout the sampling period.

- Total nitrogen – total nitrogen concentrations fluctuated throughout the year at both the reference and impact sites on the north and south bank. Total nitrogen concentrations were generally lower in the first half of the year, with lowest concentrations recorded between February and March 2021 before a notable increase in April, when concentrations remained high until the end of this reporting period (September 2021). In June 2021 noticeably elevated concentrations of TN (1.2mg/L) were recorded across all sites (reference and impact) on both the north and south bank. These high concentrations are likely due to the rainfall (6.2mm) that fell prior to sampling. Aside from this one instance, overall the

demolition of the existing Windsor Bridge and operation of the bridge to not appear to have impacted on total nitrogen concentrations within with the Hawkesbury River.

- Total phosphorus – similar to total nitrogen, concentrations of total phosphorus fluctuated throughout the year at both reference and impact sites on the north and south bank and were generally outside the pre-construction SSTVs and occasionally outside the 20th and 80th percentile reference site. Low concentrations for TP were generally only recorded at the start of the reporting period (November 2020 to January 2021). After this time, TP increased and showed variation between sites. Highest concentrations of TP (0.05mg/L) were recorded in March 2021 at impact site NC-IS10DS, however this did not correspond to high concentrations at other sites with TP of 0.02mg/L recorded at the reference site and TP not detected (<0.01mg/L) at the impact site 50 metres downstream (NC-IS50DS). Similarly on the south bank, the highest TP of 0.04mg/L was also recorded in March 2021, but at the impact site upstream (SC-IS10US), which was double the concentration recorded at SC-IS10DS and four times the concentration recorded at the reference site and the downstream impact site SC-IS50DS. As sampling is undertaken on an outgoing tide it is likely that these are localised spikes in total phosphorus concentrations and not attributable to demolition or operation of the bridge.
- Metals – concentrations of the dissolved metals antimony, arsenic, cadmium, chromium, copper, lead, selenium, silver, zinc, boron and mercury were below the limit of reporting on all sampling occasions at all reference and impacts sites on both the north and south bank.

Dissolved aluminium was detected at impact and reference sites on the north and south bank in April, May and July, August and September 2021. Despite detections, the ANZG (2018) guideline was only exceeded on one occasion in August 2021 at both the reference and impact sites.

Barium was detected on all occasions at both reference and impact sites on the north and south bank. Concentrations ranged between 0.16mg/L to 0.32mg/L, however there is no guideline for this toxicant.

Lithium was frequently detected at all sites, reference and impact but there is no guideline for this toxicant. Generally concentrations were similar between sites and less than the concentrations recorded during pre-construction monitoring and the 20th percentile reference value. It would appear that lithium concentrations have decreased over time.

Iron was not detected at any sites, reference or impact in November 2020 and January 2021 and concentrations in the first half of the year were generally lower than the latter. From April 2021 onwards concentrations of iron at both the north and south banks (reference and impact) exceeded the pre-construction SSTV and at most times the 80th percentile reference site concentration. Despite the higher concentrations the adopted guideline of 0.3mg/L was not exceeded.

- Hydrocarbons and pesticides – no derivatives of organochlorine or organophosphorus pesticides were detected in surface water during the demolition and operational monitoring periods. No derivatives of polynuclear aromatic hydrocarbons, total petroleum hydrocarbons, total recoverable hydrocarbons or BTEXN were detected in surface water. This finding is consistent with pre-construction monitoring and year 1 and 2 of construction monitoring.

Wet weather

- pH – pH levels during wet weather varied between reference, control and impact sites, particularly following higher rainfall events which generally showed increased pH on three of the four wet weather sampling events, with the control sites on both the north and south bank having the highest pH. On the south bank, the reference site had the lowest pH on 3 of 4 sampling events, however on the north bank it was the downstream sites that had the lower concentration on three occasions. Despite variable pH, it fell within the recommended guidelines of 6.5-8.5 on all sampling occasions at all sites on the south bank. On the north bank there was one event in February 2021 where pH was below the lower limit at

the reference site and 10m upstream and downstream of the bridge. pH during this time was notably better at the control site and 50m downstream.

- Turbidity – Turbidity levels varied between wet weather events on both the northern and southern banks. Turbidity was similar between all sites reference, control and impact following all wet weather events with the exception of 25 August 2021. Following rainfall in August, turbidity levels at the control and impact sites, particularly on the southern bank were notably higher than the reference site. As high turbidity was recorded at the control and impact site, its likely runoff from the surrounding catchment caused this elevated turbidity and not runoff from the project.
- Dissolved oxygen – Dissolved oxygen levels following rainfall were generally similar between sites showing very little variation between reference, control and impact sites (<7% saturation), with the exception of the north bank in December 2020 and the south bank in February 2021. In December 2020 dissolved oxygen was notably higher at the reference and control site (111% saturation) compared to the impact site NCIS50DS which had a DO reading of 88.1 % saturation. Similarly, the DO on the south bank following rainfall February 2021 had higher saturation at the reference site (112.8% saturation) compared to the control and impact sites (~87% saturation). As fluctuation in DO can occur both temporally and spatially, changes in dissolved oxygen are unlikely to be attributable to the demolition and/or operation of the new bridge.
- Total nitrogen concentrations recorded following rainfall show little variation between reference, control and impact sites and recorded concentrations are not too dissimilar from concentrations recorded during dry weather. There was one occasion on 25 August when TN concentrations appeared to fluctuate between sites and were notably higher downstream on the south bank. At the time of sampling, TN concentrations were 1.4mg/L at the reference site (SC-RS100), increasing to 1.7mg/L at the control site (SC-CS) and further increased to 2mg/L at the impact sites (SC-IS50DS).
- Total phosphorus concentrations showed spatial and temporal variation following rainfall events on both the north and south banks. On the north bank, concentrations of TP were generally higher (or the same) at the control site. Despite the higher concentrations at the control sites, this did not influence TP concentrations downstream. On the south bank TP concentrations showed the greatest variation and on two of the wet weather events, TP was notably higher at the impact site than the reference and control sites.
- Metals – concentrations of dissolved metals antimony, cadmium, chromium, copper, lead, selenium, silver, zinc, boron and mercury were below the limit of reporting at all reference, control and impacts sites during wet weather sampling. Nickel was below the limit of reporting for all sites on all occasions with the exception of the impact site (SC-IS50DS) on the south bank which recorded nickel at the limit of detection (0.001mg/L) on 25 August 2021.

Arsenic concentrations were not detected at any site with the exception of reference site NC-RS50 when a concentration of 0.002mg/L was recorded on 25 August 2021. Despite the detection, the concentration of arsenic was well below the recommended guideline limit.

Aluminium was only detected on one of the four wet weather events on both the north and south bank. Sampling undertaken on 3 February 2021 detected aluminium at all sites. Concentrations on the south bank did not vary between reference, impact and control sites with aluminium of 0.03mg/L recorded at all sites which is below the recommended ANGZ (2018) guideline for protection of aquatic ecosystems. On the northern bank, concentrations of 0.03mg/L were recorded at all sites with the exception of the impact site immediately downstream of the bridge (NC-IS0DS) which recorded concentrations of 0.04mg/L. This slight increase did not appear to affect water quality further downstream which had concentrations the same as reference and control sites.

Dissolved iron concentrations were detected on three of the four sampling occasions following rainfall. On the north bank, concentrations were generally the same between reference, control and impact sites,

or marginally higher at the reference site. On the south bank, dissolved iron concentrations showed more variation between sites, with often the impact or control site having higher concentrations than the impact sites, indicating that the demolition and operation of the bridge does not influence dissolved iron concentrations.

Lithium concentrations showed little variation between sites with the exception of February 2021 when concentrations of 0.004mg/L recorded at the reference site were more 4 times greater than the control and impact sites. Concentration on the south bank showed no variation between reference, control and impact sites with the exception of August 2021 when lithium concentrations of 0.03mg/L at the downstream impact sites were higher than the concentration 0.03mg/L recorded at the reference and control site.

Barium was detected on all wet weather sampling events but showed little variation in concentration between reference, control and impact sites. There is no recommended guideline for this toxicant.

Manganese concentrations following rainfall were always recorded below the recommended ANZG (2018) guideline limit of 1.9mg/L. Concentrations between reference, control and impact sites showed little variation with the exception of the wet weather event in August 2021. During this sampling event manganese concentrations on the south bank increased downstream ranging between 0.032mg/L at the reference site to 0.046mg/L at the impact site. On the north bank, the opposite was observed, concentrations decreased between reference (0.033mg/L) and impact (0.029mg/L) sites.

- Hydrocarbons and pesticides – no derivatives of organochlorine or organophosphorus pesticides were detected in surface water following rainfall during year 3 of monitoring. No derivatives of polynuclear aromatic hydrocarbons, total petroleum hydrocarbons, total recoverable hydrocarbons or BTEXN were detected in surface water samples. This finding is consistent with pre-construction monitoring and year 1 and 2 of construction monitoring.

3.6.2 Groundwater

Groundwater monitoring was undertaken quarterly over the past year, with the exception of the south bank borehole (SC-BH01) when only three samples were collected (November, February and May) due to the borehole being inaccessible after May 2021 (refer Section 0).

- GW level – groundwater level data was downloaded from the piezometer NC-BH02 and NC-RBH01 A and B. No groundwater level data could be downloaded from the south bank borehole (SC-BH01) as it is no longer accessible.
- Groundwater level trends appear to be comparable to previous years, although some noticeable fluctuations in levels were observed at particular times (refer Figure 3-3). Following the significant rainfall event in March 2021, peaks in groundwater levels were observed. This flooding resulted in an increase in groundwater depth in both boreholes. Depth changes were also observed between August and December 2020 at NC-NH02B which are likely due to the data logger itself rather than changes in groundwater depth.

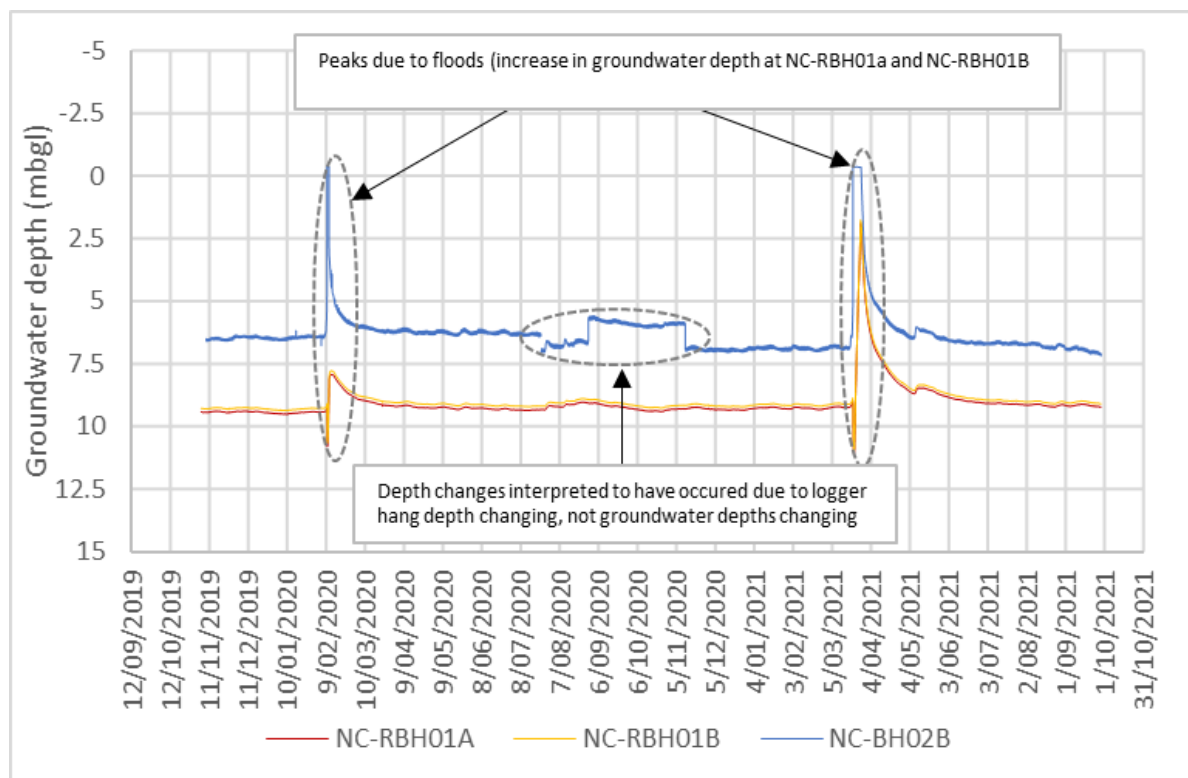


Figure 3-3 Groundwater levels

- pH – pH levels in the groundwater bores generally fell within the recommended limits of 6.5-8.5 (ANZG 2018), with the exception of September 2021 when pH levels fell below 6 at all monitoring bores (exception of SC-BH01 which is no longer accessible). pH levels below 6 have generally not been recorded at any of the monitoring bores previously (during pre-construction or construction) with the exception of NC-BH02B which recorded pH less than 6 in July 2019 and January 2020.

pH levels of the construction/operation bores were generally not compliant with the cumulative 20th and 80th percentile SSTVs for the reference borehole. pH at the borehole on the south bank SC-BH01 was greater than the 80th percentile value at the reference borehole NC-RB01 on all three sampling events undertaken in the past 12 months. pH readings at the north bank borehole were more compliant, with pH levels at NC-BH02A complying once and NC-BH02B on three of four occasions. pH levels were generally not compliant at the south bank borehole due to higher pH levels which whilst exceeding the SSTVs did meet the ANZG (2018) guidelines. On the north bank, the SSTV was exceeded in September 2021 due to low pH levels.

- Turbidity – turbidity levels varied between the boreholes and continued to be lowest at the reference boreholes where levels remained below the ANZG (2018) guideline of 50NTU for protection of aquatic ecosystems on all sampling occasions except September 2021. In September, turbidity levels of ~52NTU were recorded at both deeper and shallower levels of the reference borehole. The north bank borehole recorded variable turbidity over the year, with the east borehole having lower turbidity, only exceeding 50NTU on one occasion (May 2021). In comparison the west borehole generally had higher turbidity, exceeding the recommended limit on all but one occasion.

Similar to previous years, turbidity levels at SC-BH01 continued to remain very high throughout the demolition and operation of the Windsor Bridge, exceeding the guidelines, reference site and SSTVs and is attributable to the sampling method undertaken at this bore. Sampling at this borehole involved purging with a bailer that can resuspend sediment into the water column. Turbidity at the north bank was also generally higher over the past 12 months exceeding the 80th percentile reference SSTV on 3 of 4 sampling occasions.

- Electrical conductivity of groundwater complies with the ANZG (2018) guideline for protection of aquatic ecosystems at the reference and impact sites. Compliance with the cumulative SSTVs was rarely achieved for both impact sites on the north and south bank. The groundwater bore (NB-BH02) with the exception of the deeper levels (NC-H02B) on two occasions, fell below the 20th percentile reference SSTV. The south bank bore (SC-BH01) had mixed compliance with the reference site, when conductivity in November 2020 fell below the 20th percentile SSTV, complied in February 2021 and exceeded the 80th percentile SSTV in May 2021.
- Dissolved oxygen – groundwater bores typically exhibit low dissolved oxygen, which was observed on most sampling occasions, although overall, dissolved oxygen concentrations were generally higher than previous years monitoring. At the reference bore, DO fell below the recommended guideline limit of 85–110% saturation on all occasions and was recorded as low as 18.1% saturation at the Permian layer of the borehole. Dissolved oxygen in borehole SC-BH01 whilst still falling below the lower limit of 85% saturation was generally higher than other boreholes due to the method of sampling. As mentioned previously, this bore is sampled using a hand bailer which can cause aeration during sampling and therefore higher DO saturation. Dissolved oxygen at the north bank borehole NC-BH02A/B generally had acceptable DO levels with the exception of September in the shallow alluvial level were very low (15.6%), and in May and September 2021 at the deeper alluvial level when DO was 68.6% and 24.1% respectively.

When dissolved oxygen was compared to the respective reference sites SSTVs, there was very little correlation at the north bank borehole which frequently falls outside 20th and 80th percentile reference site. On the south bank dissolved oxygen levels whilst falling below the lower recommended ANZG (2018) had levels comparable to the reference bores SSTVs.

3.6.3 Project response to water quality results

Changes in water quality were occasionally observed during the past 12 months of monitoring. Demolition of the existing Windsor Bridge and operation of the new bridge were the key activities occurring at the site. Whilst there were occasions of elevated nutrients and some metals over the past 12 months, there was no noticeable trend temporally or spatially and therefore are likely to relate to the environmental conditions at the time of sampling rather than activities associated with Windsor Bridge. Following wet weather, water quality was generally poorer, particularly on the south bank. The northern bank which would receive discharge from the operational water quality basin following a rain event generally had acceptable water quality that was similar to upstream water quality inferring that treatment measures appear to be effective.

Similarly to year 2 of the monitoring program the past 12 months were notably wetter than year 1, particularly in the latter half of the year with some extreme events recorded. Despite this, there was generally no discernible difference in water quality between the reference, controls and impacts sites.

3.6.4 Monitoring program improvement recommendations

Based on the results of water quality during the past 12 months which included the operation of the new Windsor Bridge and demolition of the existing bridge, it is recommended to continue to implement the operational monitoring program to the end of 2021.

Appendix A. Monitoring Locations

Water Type	Site Name	Description
Groundwater	NC-RBH01S (NC-RBH01A)	Reference site – shallow
	NC-RBH01D (NC-RBH01B)	Reference site – deep
	SC-BH01	South bank borehole
	NC-BH02S (NC-BH02A)	North bank borehole – shallow
	NC-BH02D (NC-BH02B)	North bank borehole – deep
Surface Water	NC-RS50	Reference site (north bank)
	SC-RS100	Reference site (south bank)
	NC-IS10 US	Impact site 1 – upstream
	NC-IS10 DS	Impact site 1 – downstream
	SC-IS10 US	Impact site 2 – upstream
	SC-IS10 DS	Impact site 2 – downstream
	NC-IS50 DS	Impact site 3 – downstream
	SC-IS50 DS	Impact site 4 – downstream
	NC-CS1	Control site 1
	SC-CS2	Control site 1

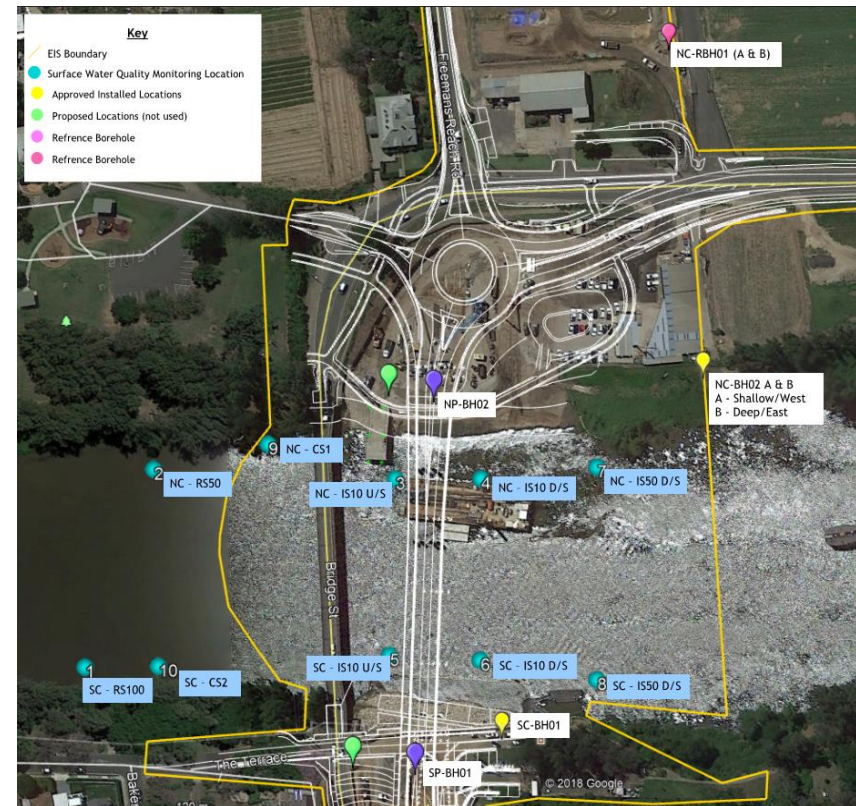


Figure A.1 Monitoring locations (source: Georgiou, 2020)

Appendix B. Rainfall Records

Date of Month	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21
1 st	0.8	18	0	0.8	0.2	0	0	0	0	1.2	0	0
2 nd	0	0.2	13.4	2	34.6	0	0	0.2	0	9.8	0	0
3 rd	0	0	3	1.8	0.2	0	0	0.2	0	0.3	4.2	0
4 th	0	0	0	5	0	0	0.2	0.6	8	0	0	0
5 th	0	3	0.2	12.4	0	0	0	5.6	0	0	0	5.2
6 th	0	18.4	5	0.2	0	0	0	14	0	0	0	0
7 th	0	0	0	1.8	1.2	0	1	29.2	0	0	0	0
8 th	0	0	0	2.6	0.8	0	19.6	1.8	0	0	0	0
9 th	0	0	0	0.2	0	0	0.8	0	5.6	3	0.4	0
10 th	0	0	0	0.2	0	1.6	0	0	2	2.4	0	0
11 th	0	0	1	0	0.2	0	0.2	0	6.4	0.2	0	0
12 th	0	0	0.2	0	0	3.8	0	0	0	3.8	0	0
13 th	0	1	0.2	0	18.2	0.2	0	0	0	0	0	0
14 th	0	0.6	2.8	0	20.4	18.4	0	0.2	0	0	0	5.4
15 th	0	0.2	3.8	0	0	12.8	0	0	0	0	0	0
16 th	0	0	9.6	0	2.4	0	0	0	0	0	0	0
17 th	0	0	8	0	2.6	3.6	0	0	6.2	0.2	0	0
18 th	0	2.8	0	0	0.8	12.2	0	0.2	0	0	0	0
19 th	10	0.2	2.6	0	13.2	65.8	0	0	1.8	0	0	0
20 th	0.2	0	5.2	0.2	0.2	49.4	0	0	0.2	0	0	0
21 st	0	6.8	0.2	0	0	64.8	0	0	1	0	0	0
22 nd	0	0.6	21	0	0	66.8	0	0.2	0	0	0	0
23 rd	0.4	2	0	0	0.4	41	0	0.2	0	0	0	0
24 th	8.2	0	0	1.2	0.2	9	0	1	0	0	27.2	0
25 th	18	0.4	0	0	1.6	0.2	0	0	0	0	19.3	0
26 th	34.2	0.2	3.4	0	2.6	0	0	0.2	0	0	0	2.2
27 th	3.4	0	2.2	0	0	0	0	0	0	0	0	0
28 th	0	0	0	2.6	0.2	0	0	0	0	0	0	0
29 th	19.4	0.4	23.4	5.2		0	0	0	0	0	0	0
30 th	2	0	15	9		0	0.2	0	1.8	0	0	1.8
31 st	0.2		2	1.2		0		0		0	0	

Appendix C. Surface and groundwater data summary

1. Surface water

Year 3 construction/operation surface water quality results at reference site 1 (NC-RS50/NO-RS50)

	Parameter	Units	LOR	Guideline	22 Sep 2020 Dry	29 Oct 2020 Wet	30 Nov 2020 Dry	16 Dec 2020 Wet	22 Jan 2021 Dry	3 Feb 2021 Wet	17 Feb 2021 Dry	17 Mar 2021 Dry	21 Apr 2021 Dry	25 May 2021 Dry	17 Jun 2021 Dry	16 Jul 2021 Dry	25 Aug 2021 Wet	31 Aug 2021 Dry	29 Sep 2021 Dry	80th Percentile (cumulative)	20th Percentile (cumulative)
	Temperature	°C		NG	18.99	19.33	24.46	24.17	25.85	22.25	24.38	22.2	18.12	22.8	20.7	22.7	13.83	13.20	18.30	25.386	14.968
	Turbidity	NTU		<50	15.9	17.7	24.3	22.1	16.3	32.4	9.5	10.6	41.5	22.1	15.4	21.5	34.97	7.57	8.08	24.64	15.44
	Dissolved Oxygen	% saturation		85-110	101.8	84.6	88	111	95.3	89.9	97.1	93.3	95.5	97.0	87.3	94.9	95.80	106.33	101.70	102.04	76.32
	Electrical Conductivity	mS/cm		0.125-2.2	0.207	0.205	0.265	0.267	0.246	0.115	0.179	0.131	0.22	0.2	0.3	0.2	0.40	0.20	0.27	0.4332	0.2178
	Salinity	ppt		NG	0.1	0.1	0.12	0.11	0.12	0.05	0.08	0.06	0.1	0.1	0.2	0.1	0.19	0.10	0.13	0.216	0.11
	ORP	MV		NG	78	70	48	102	104	158	224	237	241	177.7	143.7	159.4	-191.13	-121.83	15.10	176.2	78
	pH	pH units		6.5-8.5	7.18	7.08	7.76	7.49	7.48	6.36	7.4	7.27	7.21	7.2	7.3	7.2	8.49	7.15	6.86	7.926	6.918
	Total Dissolved Solids	mg/L	10	NG	118	113	133	166	147	64	94	76	148	134	197	134	233	116	146	254.6	132
	Suspended Solids	mg/L	5	50	16	14	12	18	6	16	6	8	10	<5	7	14	24	17	6	19	8.8
	Hydroxide Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Carbonate Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Bicarbonate Alkalinity as CaCO3	mg/L	1	NG	43	30	55	58	53	15	32	26	49	35	45	41	53	41	47	64.2	65.4
	Total Alkalinity as CaCO3	mg/L	1	NG	43	30	55	58	53	15	32	26	49	35	45	41	53	41	47	64.2	65.4
	Sulfate as SO4 - Turbidimetric	mg/L	1	NG	13	13	18	17	14	7	8	8	15	12	18	14	25	11	15	25	13
	Chloride	mg/L	1	NG	29	33	35	45	37	20	33	20	37	26	55	32	71	29	38	73.8	40.4
	Calcium	mg/L	1	NG	11	8	13	12	12	5	7	6	13	8	11	10	12	8	12	13.6	8
	Magnesium	mg/L	1	NG	7	6	7	8	7	3	4	4	8	5	7	6	9	5	7	9.8	6
	Sodium	mg/L	1	NG	20	22	28	30	23	15	21	17	25	16	32	22	44	17	25	57.8	27.8
	Potassium	mg/L	1	NG	3	4	4	4	4	3	2	2	3	3	4	3	5	3	4	5.8	3
Dissolved Metals	Aluminium	mg/L	0.01	0.055	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.01	0.02	<0.01	0.02	<0.01	0.06	0.03	0.02	0.01
	Antimony	mg/L	0.001	NG	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Arsenic	mg/L	0.001	0.024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Barium	mg/L	0.001	NG	0.026	0.022	0.03	0.03	0.027	0.014	0.018	0.017	0.031	0.022	0.027	0.021	0.027	0.02	0.024	0.0398	0.026
	Cadmium	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Chromium	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001
	Copper	mg/L	0.001	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.022	0.001
	Lead	mg/L	0.001	0.0034	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Lithium	mg/L	0.001	NG	<0.001	0.002	0.002	0.003	0.002	0.004	0.004	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.002	0.006	0.002
	Manganese	mg/L	0.001	1.9	0.022	0.013	<0.001	0.001	<0.001	0.004	0.006	0.008	0.212	0.082	0.101	0.056	0.033	0.013	0.037	0.04	0.002

	Nickel	mg/L	0.001	0.011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.001	<0.001	<0.001	<0.001	0.001	0.001
	Selenium	mg/L	0.01	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
	Silver	mg/L	0.001	0.00005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Zinc	mg/L	0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0076	0.0068
	Boron	mg/L	0.05	0.37	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
	Iron	mg/L	0.05	0.3	0.09	0.11	<0.05	<0.05	<0.05	0.12	0.1	0.06	0.27	0.16	0.17	0.14	0.06	0.18	0.21	0.264	0.05
	Mercury	mg/L	0.0001	0.00006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Nitrite + Nitrate as N	mg/L	0.01	0.04	0.55	0.37	0.3	0.17	0.26	0.16	0.23	0.18	0.51	0.45	0.79	0.54	0.82	0.54	0.44	0.594	0.27
	Total Kjeldahl Nitrogen as N	mg/L	0.1	NG	0.4	0.4	0.3	0.4	0.4	0.2	0.2	0.2	0.4	0.3	0.4	0.4	0.5	0.3	0.3	0.48	0.3
	Total Nitrogen as N	mg/L	0.1	0.35	1.0	0.8	0.6	0.6	0.7	0.4	0.4	0.4	0.9	0.8	1.2	0.9	1.3	0.8	0.7	1	0.54
	Total Phosphorus as P	mg/L	0.01	0.025	0.02	0.03	<0.01	<0.01	<0.01	0.03	0.01	0.02	0.04	0.01	0.02	0.02	0.02	<0.01	0.01	0.03	0.01
	Total Anions	meq/L	0.01	NG	1.95	1.8	2.46	2.78	2.39	1.01	1.74	1.25	2.34	1.68	2.82	2.01	3.58	1.87	2.32		
	Total Cations	meq/L	0.01	NG	2.07	1.95	2.54	2.66	2.28	1.22	1.64	1.42	2.47	1.58	2.62	2.03	3.38	1.63	2.36		
Organochlorine Pesticides	alpha-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5		<0.5	<0.5		
	Hexachlorobenzene (HCB)	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	beta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	gamma-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	delta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor	µg/L	0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Aldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor epoxide	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	trans-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	alpha-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	cis-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4`-DDE	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	beta-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4`-DDD	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin aldehyde	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endosulfan sulfate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4`-DDT	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.5	<2.0	<0.5	<2.0	<2.0		
	Endrin ketone	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<2.0	<0.5	<0.5		
	Methoxychlor	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.5	<2.0	<0.5	<2.0	<2.0		
	Total Chlordane (sum)	µg/L	0.5	0.03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<2.0	<0.5	<0.5		

	Sum of DDD + DDE + DDT	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Sum of Aldrin + Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Organophosphorus Pesticides	Dichlorvos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Demeton-S-methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Monocrotophos	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Dimethoate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Diazinon	µg/L	5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos-methyl	µg/L	0.5	0.001	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion-methyl	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Malathion	µg/L	0.5	0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenthion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion	µg/L	2	0.004	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Pirimphos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorfenvinphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Bromophos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenamiphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Prothiofos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Ethion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Carbophenothion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Azinphos Methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Polynuclear Aromatic Hydrocarbons	Naphthalene	µg/L	1	16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluorene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Phenanthrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benz(a)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Chrysene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(b+j)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(k)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(a)pyrene	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Indeno(1.2.3.cd)pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		

	Dibenz(a,h)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0		
	Benzo(g,h,i)perylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0		
	Sum of polycyclic aromatic hydrocarbons	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5		
	Benzo(a)pyrene TEQ (zero)	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5		
Total Petroleum Hydrocarbons	C6 - C9 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		<20	<20	<20	<20		
	C10 - C14 Fraction	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		<50	<50	<50	<50		
	C15 - C28 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		<100	<100	<100	<100		
	C29 - C36 Fraction	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		<50	<50	<50	<50		
	C10 - C36 Fraction (sum)	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		<50	<50	<50	<50		
	C6 - C10 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		<20	<20	<20	<20		
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		<20	<20	<20	<20		
Total recoverable Hydrocarbons	>C10 - C16 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		<100	<100	<100	<100		
	>C16 - C34 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		<100	<100	<100	<100		
	>C34 - C40 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		<100	<100	<100	<100		
	>C10 - C40 Fraction (sum)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		<100	<100	<100	<100		
	>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		<100	<100	<100	<100		
	Benzene	µg/L	1	950	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1		
	Toluene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2	<2	<2		
BTExN	Ethylbenzene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2	<2	<2		
	meta- & para-Xylene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2	<2	<2		
	ortho-Xylene	µg/L	2	350	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2	<2	<2		
	Total Xylenes	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2	<2	<2		
	Sum of BTExN	µg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1		
	Naphthalene	µg/L	5	NG	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	<5	<5	<5		

Year 3 construction/operation surface water quality results at reference site 2 (SC-RS100/SO-RS100)

	Parameter	Units	LOR	Guideline	22 Sep 2020 Dry	29 Oct 2020 Wet	30 Nov 2020 Dry	16 Dec 2020 Wet	22 Jan 2021 Dry	3 Feb 2021 Wet	17 Feb 2021 Dry	17 Mar 2021 Dry	21 Apr 2021 Dry	25 May 2021 Dry	17 Jun 2021 Dry	16 Jul 2021 Dry	25 Aug 2021 Wet	31 Aug 2021 Dry	29 Sep 2021 Dry	80th Percentile (cumulative)	20th Percentile (cumulative)
	Temperature	°C		NG	19.25	19.51	24.8	24.2	26.07	22.17	24.39	22.05	18.23	22.7	22.6775	22.6	13.83	13.40	17.97	25.374	15.624
	Turbidity	NTU		<50	14.1	16.3	15.6	23.3	16.1	33	9.9	12	22.8	18.6	14.3	18.1	37.30	7.75	10.67	23.94	13.02
	Dissolved Oxygen	% saturation		85-110	106.9	89.5	140.8	93.8	103	112.8	100.1	99.9	93.9	104.2	100.1	103.8	93.90	101.90	96.03	118	82.66
	Electrical Conductivity	mS/cm		0.125-2.2	0.205	0.216	0.247	0.261	0.241	0.11	0.179	0.134	0.231	0.2	0.216	0.2	0.43	0.20	0.29	0.4118	0.2154
	Salinity	ppt		NG	0.1	0.1	0.12	0.12	0.11	0.05	0.08	0.07	0.11	0.1	0.1	0.1	0.21	0.10	0.14	0.206	0.11
	ORP	MV		NG	46	65	-16	78	89	167	233	248	237	137.6	137.625	137.6	-250.23	-71.37	40.10	151	32
	pH	pH units		6.5-8.5	7.36	6.81	7.39	7.37	7.58	6.27	7.36	7.12	7.15	7.1	7.15	7.1	8.66	7.75	7.09	7.892	7.136
	Total Dissolved Solids	mg/L	10	NG	114	135	132	168	148	76	128	82	150	130	186	127	226	127	163	216.4	135.4
	Suspended Solids	mg/L	5	50	13	11	11	16	9	20	8	10	8	<5	8	8	25	8	6	16	7.6
	Hydroxide Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Carbonate Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Bicarbonate Alkalinity as CaCO3	mg/L	1	NG	44	33	53	55	58	16	35	26	52	35	41	38	52	47	51	55.2	34.8
	Total Alkalinity as CaCO3	mg/L	1	NG	44	33	53	55	58	16	35	26	52	35	41	38	52	47	51	55.2	34.8
	Sulfate as SO4 - Turbidimetric	mg/L	1	NG	13	14	18	18	14	7	8	8	15	12	18	14	26	11	18	21.6	12.2
	Chloride	mg/L	1	NG	30	36	34	44	40	20	34	21	38	26	54	32	73	30	44	59.2	39.6
	Calcium	mg/L	1	NG	11	8	12	12	12	4	7	6	13	9	10	11	13	9	12	11	8
	Magnesium	mg/L	1	NG	7	6	7	8	7	3	4	4	8	6	7	6	9	5	8	8	6
	Sodium	mg/L	1	NG	20	24	27	28	24	13	21	14	26	17	29	22	47	18	30	43.2	28
	Potassium	mg/L	1	NG	4	4	4	4	4	2	2	2	4	3	3	3	6	3	4	5	3
Discarded Metals	Aluminium	mg/L	0.01	0.055	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.01	0.02	<0.01	0.02	<0.01	0.07	0.04	0.02	0.01
	Antimony	mg/L	0.001	NG	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Arsenic	mg/L	0.001	0.024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Barium	mg/L	0.001	NG	0.027	0.023	0.03	0.029	0.028	0.013	0.018	0.016	0.032	0.024	0.028	0.021	0.027	0.021	0.026	0.032	0.025
	Cadmium	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Chromium	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001
	Copper	mg/L	0.001	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0014	0.001
	Lead	mg/L	0.001	0.0034	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.002
	Lithium	mg/L	0.001	NG	<0.001	0.002	0.002	0.003	0.002	0.001	0.003	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.002	0.0088	0.002
	Manganese	mg/L	0.001	1.9	0.023	0.014	<0.001	<0.001	<0.001	0.004	0.008	0.013	0.211	0.087	0.102	0.056	0.032	0.015	0.031	0.0306	0.0028

	Nickel	mg/L	0.001	0.011	0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001	0.0018	0.001
	Selenium	mg/L	0.01	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
	Silver	mg/L	0.001	0.00005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Zinc	mg/L	0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0254	0.0086
	Boron	mg/L	0.05	0.37	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
	Iron	mg/L	0.05	0.3	0.11	0.14	<0.05	<0.05	<0.05	0.12	0.09	0.06	0.24	0.17	0.17	0.14	0.06	0.19	0.21	0.132	0.05
	Mercury	mg/L	0.0001	0.00006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Nitrite + Nitrate as N	mg/L	0.01	0.04	0.56	0.36	0.3	0.18	0.26	0.16	0.24	0.20	0.50	0.46	0.78	0.56	0.81	0.53	0.46		
	Total Kjeldahl Nitrogen as N	mg/L	0.1	NG	0.8	0.4	0.5	0.5	0.4	0.2	0.3	0.2	0.4	0.3	0.4	0.4	0.6	0.3	0.3		
	Total Nitrogen as N	mg/L	0.1	0.35	1.4	0.8	0.8	0.7	0.7	0.4	0.5	0.4	0.9	0.8	1.2	1.0	1.4	0.8	0.8		
	Total Phosphorus as P	mg/L	0.01	0.025	0.02	0.02	<0.01	<0.01	<0.01	0.03	0.02	0.01	0.04	0.02	0.02	0.02	0.02	<0.01	0.08		
	Total Anions	meq/L	0.01	NG	2.00	1.97	2.39	2.71	2.58	1.03	1.82	1.28	2.42	1.68	2.72	1.95	3.64	2.01	2.63		
	Total Cations	meq/L	0.01	NG	2.10	2.04	2.45	2.58	2.32	1.06	1.64	1.29	2.54	1.76	2.41	2.08	3.59	1.72	2.66		
Organochlorine Pesticides	alpha-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Hexachlorobenzene (HCB)	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	beta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	gamma-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	delta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor	µg/L	0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Aldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor epoxide	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	trans-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	alpha-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	cis-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4´-DDE	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	beta-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4´-DDD	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin aldehyde	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endosulfan sulfate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4´-DDT	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Endrin ketone	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Methoxychlor	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		

	Total Chlordane (sum)	µg/L	0.5	0.03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Sum of DDD + DDE + DDT	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Sum of Aldrin + Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Organochlorine Pesticides	Dichlorvos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Demeton-S-methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Monocrotophos	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Dimethoate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Diazinon	µg/L	5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos-methyl	µg/L	0.5	0.001	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion-methyl	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Malathion	µg/L	0.5	0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenthion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion	µg/L	2	0.004	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Pirimphos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorfenvinphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Bromophos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenamiphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Prothiofos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Ethion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Carbophenothion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Azinphos Methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Polycyclic Aromatic Hydrocarbons	Naphthalene	µg/L	1	16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluorene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Phenanthrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benz(a)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Chrysene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(b+j)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		

	Benzo(k)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(a)pyrene	µg/L	1	NG	<0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Indeno(1.2.3.cd)pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Dibenz(a,h)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(g,h,i)perylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Sum of polycyclic aromatic hydrocarbons	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Benzo(a)pyrene TEQ (zero)	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Total Detectable Hydrocarbons	C6 - C9 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	C10 - C14 Fraction	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
	C15 - C28 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	C29 - C36 Fraction	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
	C10 - C36 Fraction (sum)	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
Total Recoverable Hydrocarbons	C6 - C10 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	>C10 - C16 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C16 - C34 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C34 - C40 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C10 - C40 Fraction (sum)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
BTEXN	Benzene	µg/L	1	950	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Toluene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Ethylbenzene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	meta- & para-Xylene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	ortho-Xylene	µg/L	2	350	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Total Xylenes	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		

	Sum of BTEX	µg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Naphthalene	µg/L	5	NG	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		

Year 3 construction/operation surface water quality results at impact site 1 (NC-IS10 US/NO-IS10US)

	Parameter	Units	LOR	Guideline	22 Sep 2020 Dry	29 Oct 2020 Wet	30 Nov 2020 Dry	16 Dec 2020 Wet	22 Jan 2021 Dry	3 Feb 2021 Wet	17 Feb 2021 Dry	17 Mar 2021 Dry	21 Apr 2021 Dry	25 May 2021 Dry	17 Jun 2021 Dry	16 Jul 2021 Dry	80th Percentile (pre- construction)	20th Percentile (pre- construction)
	Temperature	°C		NG	19.13	19.64	24.46	24.26	25.79	22.26	24.31	22.13	18.96	23.2	23.7	23.2	28.04	24.28
	Turbidity	NTU		<50	15.4	18.4	24.3	22.9	21.4	32.7	11	11.8	16	20.0	15.1	19.5	17.75	12.11
	Dissolved Oxygen	% saturation		85-110	99.4	104.7	88	75.4	92.4	107.8	70.2	78.5	87.1	85.6	86.4	85.7	93.2	84.7
	Electrical Conductivity	mS/cm		0.125-2.2	0.209	0.22	0.265	0.274	0.272	0.109	0.191	0.143	0.288	0.2	0.2	0.2	0.42	0.37
	Salinity	ppt		NG	0.1	0.1	0.12	0.13	0.13	0.05	0.09	0.07	0.14	0.1	0.1	0.1	0.18	0.17
	ORP	MV		NG	93	85	48	116	125	163	108	177	152	127.0	126.0	126.8	205.1	134.11
	pH	pH units		6.5-8.5	7.44	7.24	7.76	7.4	7.24	6.39	7.81	7.53	7.3	7.3	7.4	7.4	7.65	7.42
	Total Dissolved Solids	mg/L	10	NG	115	127	136	180	166	58	118	88	162	113	218	133	236	226
	Suspended Solids	mg/L	5	50	13	15	14	16	6	20	10	10	8	<5	8	6	16	13
	Hydroxide Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Carbonate Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Bicarbonate Alkalinity as CaCO3	mg/L	1	NG	44	39	56	60	53	15	34	27	52	35	45	41	64	56
	Total Alkalinity as CaCO3	mg/L	1	NG	44	39	56	60	53	15	34	27	52	35	45	41	64	56
	Sulfate as SO4 - Turbidimetric	mg/L	1	NG	13	14	18	18	16	7	8	8	17	12	20	15	22	18
	Chloride	mg/L	1	NG	30	36	35	46	45	19	34	22	44	26	60	34	72	59
	Calcium	mg/L	1	NG	11	8	13	12	13	4	6	6	14	8	11	10	11	10
	Magnesium	mg/L	1	NG	7	6	7	8	8	3	4	4	9	5	8	6	8	7
	Sodium	mg/L	1	NG	20	24	28	31	30	13	21	14	31	17	34	22	49	47
	Potassium	mg/L	1	NG	3	4	4	4	4	2	2	2	4	2	4	3	5	5
Discussed Materials	Aluminium	mg/L	0.01	0.055	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.01	0.02	<0.01	0.02	0.034	0.018
	Antimony	mg/L	0.001	NG	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Arsenic	mg/L	0.001	0.024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Barium	mg/L	0.001	NG	0.026	0.024	0.029	0.029	0.029	0.013	0.017	0.018	0.031	0.024	0.029	0.021	0.037	0.034
			0.000															
	Cadmium	mg/L	1	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Chromium	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001
	Copper	mg/L	0.001	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Lead	mg/L	0.001	0.0034	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Lithium	mg/L	0.001	NG	<0.001	0.002	0.004	0.003	0.002	0.001	0.003	0.001	0.001	0.001	0.001	0.002	0.007	0.006
	Manganese	mg/L	0.001	1.9	0.022	0.011	<0.001	0.001	0.002	0.003	0.005	0.010	0.217	0.089	0.095	0.056	0.017	0.004

	Nickel	mg/L	0.001	0.011	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.001	<0.001	0.001	<0.001	0.001	0.001	
	Selenium	mg/L	0.01	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
	Silver	mg/L	0.001	0.00005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
	Zinc	mg/L	0.005	0.008	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	0.01	
	Boron	mg/L	0.05	0.37	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			
	Iron	mg/L	0.05	0.3	0.09	0.1	<0.05	<0.05	<0.05	0.12	0.1	0.08	0.25	0.16	0.14	0.15	0.0132	0.078
	Mercury	mg/L	0.0001	0.00006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Nitrite + Nitrate as N	mg/L	0.01	0.04	0.56	0.4	0.3	0.18	0.28	0.16	0.21	0.18	0.56	0.46	0.79	0.56	0.43	0.08
	Total Kjeldahl Nitrogen as N	mg/L	0.1	NG	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.5	0.4
	Total Nitrogen as N	mg/L	0.1	0.35	1.0	0.7	0.6	0.6	0.7	0.5	0.5	0.5	1.0	0.8	1.2	1.0	0.9	0.6
	Total Phosphorus as P	mg/L	0.01	0.025	0.03	0.02	<0.01	<0.01	<0.01	0.01	0.03	0.03	0.04	0.02	0.02	0.02	0.04	0.02
	Total Anions	meq/L	0.01	NG	2.00	2.09	2.48	2.87	2.66	0.98	1.8	1.33	2.63	1.68	3.01	2.09	3.68	3.24
	Total Cations	meq/L	0.01	NG	2.07	2.04	2.54	2.71	2.71	1.06	1.59	1.29	2.89	1.60	2.79	2.03	3.64	3.29
Organochlorine Pesticides	alpha-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Hexachlorobenzene (HCB)	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	beta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	gamma-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	delta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor	µg/L	0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Aldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor epoxide	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	trans-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	alpha-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	cis-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4´-DDE	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	beta-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4´-DDD	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin aldehyde	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endosulfan sulfate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4´-DDT	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		

	Endrin ketone	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Methoxychlor	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Total Chlordane (sum)	µg/L	0.5	0.03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Sum of DDD + DDE + DDT	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Sum of Aldrin + Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Organophosphorus Insecticides	Dichlorvos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Demeton-S-methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Monocrotophos	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Dimethoate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Diazinon	µg/L	5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos-methyl	µg/L	0.5	0.001	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion-methyl	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Malathion	µg/L	0.5	0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenthion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion	µg/L	2	0.004	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Pirimphos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorfenvinphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Bromophos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenamiphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Prothiofos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Ethion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Polynuclear Aromatic Hydrocarbons	Carbophenothion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Azinphos Methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Naphthalene	µg/L	1	16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluorene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Phenanthrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		

	Pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
	Benz(a)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
	Chrysene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
	Benzo(b+j)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
	Benzo(k)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
	Benzo(a)pyrene	µg/L	1	NG	<0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.6		
	Indeno(1.2.3.cd)pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Dibenz(a,h)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(g,h,i)perylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Sum of polycyclic aromatic hydrocarbons	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Benzo(a)pyrene TEQ (zero)	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Total Petroleum Hydrocarbons	C6 - C9 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
C10 - C14 Fraction		µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
C15 - C28 Fraction		µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
C29 - C36 Fraction		µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
C10 - C36 Fraction (sum)		µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
Total Volatile Hydrocarbons	C6 - C10 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20			
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20			
	>C10 - C16 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
	>C16 - C34 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
	>C34 - C40 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
	>C10 - C40 Fraction (sum)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			

	>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	Benzene	µg/L	1	950	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Toluene	µg/L	2	NG	<2	4	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
BTEXN	Ethylbenzene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	meta- & para-Xylene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	ortho-Xylene	µg/L	2	350	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Total Xylenes	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Sum of BTEX	µg/L	1	NG	<1	4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Naphthalene	µg/L	5	NG	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		

Year 3 construction/operation surface water quality results at impact site 2 (NC-IS10 DS/NO-IS10DS)

	Parameter	Units	LOR	Guideline	22 Sep 2020 Dry	29 Oct 2020 Wet	30 Nov 2020 Dry	16 Dec 2020 Wet	22 Jan 2021 Dry	3 Feb 2021 Wet	17 Feb 2021 Dry	17 Mar 2021 Dry	21 Apr 2021 Dry	25 May 2021 Dry	17 Jun 2021 Dry	16 Jul 2021 Dry	80th Percentile (pre- construction)	20th Percentile (pre- construction)
	Temperature	°C		NG	19.08	19.52	25.66	24.15	25.79	22.2	24.44	22.13	18.77	22.91	22.6	22.5	28.04	24.28
	Turbidity	NTU		<50	15.5	16.5	18.6	23.6	20.5	33	9.9	11.6	16.4	19.17	15.6	18.2	17.75	12.11
	Dissolved Oxygen	% saturation		85-110	98.1	81.3	85.5	81.6	87.5	87.1	80.2	93.9	88.3	86.43	86.8	87.0	93.2	84.7
	Electrical Conductivity	mS/cm		0.125-2.2	0.211	0.214	0.246	0.277	0.265	0.109	0.182	0.146	0.282	0.21	0.2	0.2	0.42	0.37
	Salinity	ppt		NG	0.211	0.214	0.246	0.277	0.265	0.109	0.182	0.146	0.282	0.21	0.2	0.2	0.18	0.17
	ORP	MV		NG	109	101	79	119	131	174	156	200	184	160.67	143.5	141.5	205.1	134.11
	pH	pH units		6.5-8.5	7.32	7.15	7.52	7.42	7.21	6.3	7.64	7.32	7.23	7.19	7.3	7.2	7.65	7.42
	Total Dissolved Solids	mg/L	10	NG	113	128	136	177	157	66	101	82	166	120	180	139	236	226
	Suspended Solids	mg/L	5	50	15	14	10	16	<5	15	8	11	10	<5	8	8	16	13
	Hydroxide Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Carbonate Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Bicarbonate Alkalinity as CaCO3	mg/L	1	NG	45	40	54	54	57	15	35	26	52	33	44	41	64	56
	Total Alkalinity as CaCO3	mg/L	1	NG	45	40	54	54	57	15	35	26	52	33	44	41	64	56
	Sulfate as SO4 - Turbidimetric	mg/L	1	NG	13	14	18	18	15	7	8	8	17	12	18	14	22	18
	Chloride	mg/L	1	NG	30	35	35	46	44	19	34	22	44	26	52	32	72	59
	Calcium	mg/L	1	NG	11	8	13	12	12	4	6	6	13	9	11	10	11	10
	Magnesium	mg/L	1	NG	7	6	7	8	8	3	4	4	9	5	7	6	8	7
	Sodium	mg/L	1	NG	20	23	28	30	29	12	21	14	31	17	29	22	49	47
	Potassium	mg/L	1	NG	4	4	4	4	4	2	2	2	4	2	3	3	5	5
Discussed Materials	Aluminium	mg/L	0.01	0.055	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	0.01	0.02	<0.01	0.01	0.034	0.018
	Antimony	mg/L	0.001	NG	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Arsenic	mg/L	0.001	0.024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Barium	mg/L	0.001	NG	0.026	0.024	0.03	0.03	0.028	0.013	0.018	0.016	0.032	0.024	0.030	0.020	0.037	0.034
			0.000															
	Cadmium	mg/L	1	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Chromium	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001
	Copper	mg/L	0.001	0.0014	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Lead	mg/L	0.001	0.0034	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Lithium	mg/L	0.001	NG	<0.001	0.002	0.002	0.003	0.002	<0.001	0.003	0.002	0.001	0.001	0.001	0.002	0.007	0.006
	Manganese	mg/L	0.001	1.9	0.026	0.012	<0.001	<0.001	0.001	0.003	0.006	0.011	0.216	0.089	0.097	0.056	0.017	0.004

	Nickel	mg/L	0.001	0.011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	0.001	<0.001	0.001	0.001	0.001
	Selenium	mg/L	0.01	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
	Silver	mg/L	0.001	0.00005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
	Zinc	mg/L	0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	0.01	
	Boron	mg/L	0.05	0.37	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			
	Iron	mg/L	0.05	0.3	0.09	0.1	<0.05	<0.05	<0.05	0.15	0.09	0.06	0.21	0.16	0.15	0.14	0.0132	0.078
	Mercury	mg/L	0.0001	0.00006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Nitrite + Nitrate as N	mg/L	0.01	0.04	0.55	0.37	0.3	0.17	0.28	0.16	0.22	0.18	0.55	0.49	0.77	0.62	0.43	0.08
	Total Kjeldahl Nitrogen as N	mg/L	0.1	NG	0.4	0.4	0.3	0.4	0.4	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.4
	Total Nitrogen as N	mg/L	0.1	0.35	1.0	0.8	0.6	0.6	0.7	0.4	0.5	0.5	0.8	0.8	1.2	1.0	0.9	0.6
	Total Phosphorus as P	mg/L	0.01	0.025	<0.01	0.03	<0.01	<0.01	<0.01	0.02	0.03	0.05	0.04	0.02	0.02	0.02	0.04	0.02
	Total Anions	meq/L	0.01	NG	2.02	2.08	2.44	2.75	2.69	0.98	1.82	1.31	2.63	1.64	2.72	2.01	3.68	3.24
	Total Cations	meq/L	0.01	NG	2.10	2	2.54	2.66	2.62	1.02	1.59	1.29	2.84	1.65	2.46	2.03	3.64	3.29
Organochlorine Pesticides	alpha-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Hexachlorobenzene (HCB)	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	beta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	gamma-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	delta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor	µg/L	0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Aldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor epoxide	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	trans-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	alpha-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	cis-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4`-DDE	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	beta-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4`-DDD	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin aldehyde	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endosulfan sulfate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4`-DDT	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		

	Endrin ketone	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Methoxychlor	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Total Chlordane (sum)	µg/L	0.5	0.03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Sum of DDD + DDE + DDT	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Sum of Aldrin + Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Organophosphorus Pesticides	Dichlorvos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Demeton-S-methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Monocrotophos	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Dimethoate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Diazinon	µg/L	5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos-methyl	µg/L	0.5	0.001	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion-methyl	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Malathion	µg/L	0.5	0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenthion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion	µg/L	2	0.004	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Pirimphos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorfenvinphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Bromophos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenamiphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Prothiofos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Ethion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Polynuclear Aromatic Hydrocarbons	Carbophenothion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Azinphos Methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Naphthalene	µg/L	1	16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluorene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Phenanthrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		

	Pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
	Benz(a)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
	Chrysene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
	Benzo(b+j)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
	Benzo(k)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
	Benzo(a)pyrene	µg/L	1	NG	<0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.6		
	Indeno(1.2.3.cd)pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Dibenz(a,h)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(g,h,i)perylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Sum of polycyclic aromatic hydrocarbons	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Benzo(a)pyrene TEQ (zero)	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Total Petroleum Hydrocarbons	C6 - C9 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
C10 - C14 Fraction		µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
C15 - C28 Fraction		µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
C29 - C36 Fraction		µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
C10 - C36 Fraction (sum)		µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
Total Volatile Hydrocarbons	C6 - C10 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20			
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20			
	>C10 - C16 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
	>C16 - C34 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
	>C34 - C40 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
	>C10 - C40 Fraction (sum)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			

	>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	Benzene	µg/L	1	950	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Toluene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
BTEXN	Ethylbenzene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	meta- & para-Xylene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	ortho-Xylene	µg/L	2	350	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Total Xylenes	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Sum of BTEX	µg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Naphthalene	µg/L	5	NG	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		

Year 3 construction/operation surface water quality results at impact site 2 (SC-IS10 US/SO-IS10US)

	Parameter	Units	LOR	Guideline	22 Sep 2020 Dry	29 Oct 2020 Wet	30 Nov 2020 Dry	16 Dec 2020 Wet	22 Jan 2021 Dry	3 Feb 2021 Wet	17 Feb 2021 Dry	17 Mar 2021 Dry	21 Apr 2021 Dry	25 May 2021 Dry	17 Jun 2021 Dry	16 Jul 2021 Dry	80th Percentile (pre- construction)	20th Percentile (pre- construction)
	Temperature	° C		NG	19.11	19.18	25.72	24.3	25.84	22.26	24.52	22.11	18.11	22.76	22.2	20.3	28.04	24.28
	Turbidity	NTU		<50	15.8	17.9	15.3	22.8	14.5	32.5	9.6	10.7	26.7	18.75	14.9	23.3	17.75	12.11
	Dissolved Oxygen	% saturation		85-110	97.2	81.2	81.6	102	92.1	90.2	88.7	90.4	97.5	90.46	91.3	91.8	93.2	84.7
	Electrical Conductivity	mS/cm		0.125-2.2	0.206	0.207	0.243	0.26	0.225	0.115	0.178	0.132	0.224	0.20	0.2	0.2	0.42	0.37
	Salinity	ppt		NG	0.1	0.1	0.11	0.12	0.11	0.05	0.08	0.06	0.1	0.09	0.1	0.1	0.18	0.17
	ORP	MV		NG	119	124	138	114	147	141	211	238	232	168.13	139.5	146.4	205.1	134.11
	pH	pH units		6.5-8.5	7.26	7	7.12	7.53	7.06	6.54	7.41	7.3	7.25	7.15	7.2	7.2	7.65	7.42
	Total Dissolved Solids	mg/L	10	NG	125	123	138	168	134	64	105	85	150	104	177	147	236	226
	Suspended Solids	mg/L	5	50	13	13	7	15	6	16	5	10	10	<5	9	8	16	13
	Hydroxide Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Carbonate Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Bicarbonate Alkalinity as CaCO3	mg/L	1	NG	47	35	54	57	49	18	38	24	51	34	42	39	64	56
	Total Alkalinity as CaCO3	mg/L	1	NG	47	35	54	57	49	18	38	24	51	34	42	39	64	56
	Sulfate as SO4 - Turbidimetric	mg/L	1	NG	12	13	18	17	13	7	8	8	15	12	17	14	22	18
	Chloride	mg/L	1	NG	29	35	34	43	35	20	34	21	37	26	53	32	72	59
	Calcium	mg/L	1	NG	11	8	12	12	12	5	6	5	12	8	10	10	11	10
	Magnesium	mg/L	1	NG	7	6	7	8	7	3	4	4	8	5	7	6	8	7
	Sodium	mg/L	1	NG	20	23	26	28	23	14	20	14	26	17	29	22	49	47
	Potassium	mg/L	1	NG	4	4	4	4	4	2	2	2	4	2	3	3	5	5
Dissolved Metals	Aluminium	mg/L	0.01	0.055	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.01	0.02	<0.01	0.01	0.034	0.018
	Antimony	mg/L	0.001	NG	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Arsenic	mg/L	0.001	0.024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Barium	mg/L	0.001	NG	0.026	0.023	0.028	0.029	0.026	0.014	0.018	0.016	0.030	0.024	0.028	0.021	0.037	0.034
	Cadmium	mg/L	0.000 1	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Chromium	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001
	Copper	mg/L	0.001	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Lead	mg/L	0.001	0.0034	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Lithium	mg/L	0.001	NG	<0.001	0.002	0.002	0.003	0.002	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.007	0.006
	Manganese	mg/L	0.001	1.9	0.021	0.017	<0.001	<0.001	<0.001	0.003	0.006	0.006	0.209	0.086	0.097	0.056	0.017	0.004
	Nickel	mg/L	0.001	0.011	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.001	0.001
	Selenium	mg/L	0.01	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
	Silver	mg/L	0.001	0.00005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		

	Zinc	mg/L	0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	0.01		
	Boron	mg/L	0.05	0.37	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
	Iron	mg/L	0.05	0.3	0.09	0.12	<0.05	<0.05	<0.05	0.11	0.1	0.07	0.26	0.17	0.17	0.14	0.078	0.0132	
	Mercury	mg/L	0.0001	0.00006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
	Nitrite + Nitrate as N	mg/L	0.01	0.04	0.56	0.35	0.3	0.18	0.26	0.16	0.22	0.18	0.50	0.44	0.77	0.54	0.43	0.08	
	Total Kjeldahl Nitrogen as N	mg/L	0.1	NG	0.4	0.3	0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.3	0.4	0.4	0.5	0.4	
	Total Nitrogen as N	mg/L	0.1	0.35	1.0	0.6	0.6	0.6	0.6	0.4	0.5	0.4	0.7	0.7	1.2	0.9	0.9	0.6	
	Total Phosphorus as P	mg/L	0.01	0.025	<0.01	0.03	<0.01	<0.01	<0.01	0.02	0.02	0.04	0.03	0.02	0.02	0.02	0.04	0.02	
	Total Anions	meq/L	0.01	NG	2.01	1.96	2.41	2.7	2.24	1.07	1.88	1.24	2.38	1.66	2.69	1.97	3.68	3.24	
	Total Cations	meq/L	0.01	NG	2.10	2	2.41	2.58	2.28	1.16	1.55	1.24	2.49	1.60	2.41	2.03	3.64	3.29	
Organochlorine Pesticides	alpha-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	Hexachlorobenzene (HCB)	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	beta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	gamma-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	delta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	Heptachlor	µg/L	0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Aldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	Heptachlor epoxide	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	trans-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	alpha-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	cis-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	4,4'-DDE	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	Endrin	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	beta-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	4,4'-DDD	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	Endrin aldehyde	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	Endosulfan sulfate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	4,4'-DDT	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
	Endrin ketone	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	Methoxychlor	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
	Total Chlordane (sum)	µg/L	0.5	0.03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	Sum of DDD + DDE + DDT	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	Sum of Aldrin + Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Organophosphates	Dichlorvos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	Demeton-S-methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
	Monocrotophos	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
	Dimethoate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			

Deluoclar Aromatic Hydrocarbons	Diazinon	µg/L	5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos-methyl	µg/L	0.5	0.001	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion-methyl	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Malathion	µg/L	0.5	0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenthion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion	µg/L	2	0.004	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Pirimphos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorfenvinphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Bromophos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenamiphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Prothiofos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Ethion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Carbophenothion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Azinphos Methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Total Deluoclar Aromatic Hydrocarbons	Naphthalene	µg/L	1	16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluorene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Phenanthrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benz(a)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Chrysene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(b+j)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(k)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(a)pyrene	µg/L	1	NG	<0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.6		
	Indeno(1.2.3.cd)pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Dibenz(a,h)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(g,h,i)perylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
Total Deluoclar Aromatic Hydrocarbons	Sum of polycyclic aromatic hydrocarbons	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Benzo(a)pyrene TEQ (zero)	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	C6 - C9 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	C10 - C14 Fraction	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
	C15 - C28 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
Total Deluoclar Aromatic Hydrocarbons	C29 - C36 Fraction	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		

	C10 - C36 Fraction (sum)	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
Total Recoverable Hydrocarbons	C6 - C10 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	>C10 - C16 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C16 - C34 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C34 - C40 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C10 - C40 Fraction (sum)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	Benzene	µg/L	1	950	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Toluene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
BTEXN	Ethylbenzene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	meta- & para- Xylene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	ortho-Xylene	µg/L	2	350	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Total Xylenes	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Sum of BTEX	µg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Naphthalene	µg/L	5	NG	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		

Year 3 construction/operation surface water quality results at impact site 2 (SC-IS10 DS/SO-IS10DS)

	Parameter	Units	LOR	Guideline	22 Sep 2020 Dry	29 Oct 2020 Wet	30 Nov 2020 Dry	16 Dec 2020 Wet	22 Jan 2021 Dry	3 Feb 2021 Wet	17 Feb 2021 Dry	17 Mar 2021 Dry	21 Apr 2021 Dry	25 May 2021 Dry	17 Jun 2021 Dry	16 Jul 2021 Dry	80th Percentile (pre- construction)	20th Percentile (pre- construction)
	Temperature	°C		NG	19.13	19.18	25.21	24.29	25.79	22.26	24.5	22.02	18.22	23.18	22.3	21.6	28.04	24.28
	Turbidity	NTU		<50	15.2	16.7	15.2	23	15.4	32.1	9.5	12.5	16.2	17.70	16.2	17.2	17.75	12.11
	Dissolved Oxygen	% saturation		85-110	97.2	83.7	86.6	86.6	91.2	84.9	89.7	96.7	98.1	90.54	90.5	90.9	93.2	84.7
	Electrical Conductivity	mS/cm		0.125-2.2	0.206	0.207	0.251	0.264	0.236	0.116	0.178	0.133	0.121	0.19	0.2	0.2	0.42	0.37
	Salinity	ppt		NG	0.1	0.1	0.12	0.12	0.11	0.05	0.08	0.06	0.13	0.10	0.1	0.1	0.18	0.17
	ORP	MV		NG	121	121	119	116	145	115	205	244	212	165.14	121.0	150.0	205.1	134.11
	pH	pH units		6.5-8.5	7.27	7.03	7.4	7.49	7.11	6.85	7.47	7.2	7.12	7.23	7.2	7.2	7.65	7.42
	Total Dissolved Solids	mg/L	10	NG	109	122	130	161	146	62	121	88	153	100	179	152	236	226
	Suspended Solids	mg/L	5	50	14	14	8	17	6	13	6	<5	10	<5	6	7	16	13
	Hydroxide Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Carbonate Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Bicarbonate Alkalinity as CaCO3	mg/L	1	NG	45	35	56	57	49	17	36	26	51	36	41	37	64	56
	Total Alkalinity as CaCO3	mg/L	1	NG	45	35	56	57	49	17	36	26	51	36	41	37	64	56
	Sulfate as SO4 - Turbidimetric	mg/L	1	NG	12	13	17	17	15	7	8	8	15	12	18	14	22	18
	Chloride	mg/L	1	NG	29	35	34	43	37	20	34	21	40	26	51	33	72	59
	Calcium	mg/L	1	NG	11	8	12	12	12	5	6	6	13	8	10	10	11	10
	Magnesium	mg/L	1	NG	7	6	7	8	7	3	5	4	8	5	7	6	8	7
	Sodium	mg/L	1	NG	20	23	26	29	24	13	21	14	28	17	30	22	49	47
	Potassium	mg/L	1	NG	3	4	4	4	4	2	2	2	4	2	4	3	5	5
Dissolved Metals	Aluminium	mg/L	0.01	0.055	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.01	0.02	<0.01	0.01	0.034	0.018
	Antimony	mg/L	0.001	NG	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Arsenic	mg/L	0.001	0.024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Barium	mg/L	0.001	NG	0.026	0.023	0.03	0.03	0.027	0.013	0.018	0.016	0.030	0.024	0.028	0.020	0.037	0.034
	Cadmium	mg/L	0.000 1	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Chromium	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001
	Copper	mg/L	0.001	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Lead	mg/L	0.001	0.0034	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Lithium	mg/L	0.001	NG	<0.001	0.002	0.002	0.003	0.002	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.007	0.006
	Manganese	mg/L	0.001	1.9	0.020	0.016	<0.001	<0.001	0.001	0.004	0.006	0.006	0.209	0.087	0.097	0.055	0.017	0.004
	Nickel	mg/L	0.001	0.011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	0.001	0.001	0.001	0.001	0.001
	Selenium	mg/L	0.01	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		

	Silver	mg/L	0.001	0.00005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
	Zinc	mg/L	0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	0.01	
	Boron	mg/L	0.05	0.37	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			
	Iron	mg/L	0.05	0.3	0.08	0.12	<0.05	<0.05	<0.05	0.12	0.1	0.06	0.26	0.13	0.19	0.14	0.0132	0.078
	Mercury	mg/L	0.0001	0.00006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
	Nitrite + Nitrate as N	mg/L	0.01	0.04	0.57	0.35	0.3	0.24	0.26	0.17	0.22	0.18	0.54	0.45	0.77	0.55	0.43	0.08
	Total Kjeldahl Nitrogen as N	mg/L	0.1	NG	0.4	0.3	0.3	0.4	0.4	0.2	0.3	0.2	0.3	0.3	0.4	0.4	0.5	0.4
	Total Nitrogen as N	mg/L	0.1	0.35	1.0	0.6	0.6	0.6	0.7	0.4	0.5	0.4	0.8	0.8	1.2	1.0	0.9	0.6
	Total Phosphorus as P	mg/L	0.01	0.025	<0.01	0.02	<0.01	<0.01	<0.01	0.01	0.02	0.02	0.03	0.02	0.02	0.02	0.04	0.02
	Total Anions	meq/L	0.01	NG	1.97	1.96	2.43	2.7	2.34	1.05	1.84	1.28	2.46	1.70	2.63	1.96	3.68	3.24
	Total Cations	meq/L	0.01	NG	2.07	2	2.41	2.62	2.32	1.11	1.68	1.29	2.63	1.60	2.48	2.03	3.64	3.29
	alpha-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Organochlorine Pesticides	Hexachlorobenzene (HCB)	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	beta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	gamma-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	delta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor	µg/L	0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Aldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor epoxide	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	trans-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	alpha-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	cis-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4'-DDE	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	beta-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4'-DDD	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin aldehyde	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endosulfan sulfate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4'-DDT	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Endrin ketone	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Methoxychlor	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Total Chlordane (sum)	µg/L	0.5	0.03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Sum of DDD + DDE + DDT	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		

	Sum of Aldrin + Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Organophosphorus Pesticides	Dichlorvos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Demeton-S-methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Monocrotophos	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Dimethoate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Diazinon	µg/L	5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos-methyl	µg/L	0.5	0.001	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion-methyl	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Malathion	µg/L	0.5	0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenthion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion	µg/L	2	0.004	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Pirimphos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorfenvinphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Bromophos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenamiphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Prothiofos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Ethion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Carbophenothion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Azinphos Methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Polynuclear Aromatic Hydrocarbons	Naphthalene	µg/L	1	16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluorene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Phenanthrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benz(a)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Chrysene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(b+j)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(k)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(a)pyrene	µg/L	1	NG	<0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.6		
	Indeno(1.2.3.cd)pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Dibenz(a,h)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		

	Benzo(g,h,i)perylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Sum of polycyclic aromatic hydrocarbons	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Benzo(a)pyrene TEQ (zero)	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Total Petroleum Hydrocarbons	C6 - C9 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	C10 - C14 Fraction	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
	C15 - C28 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	C29 - C36 Fraction	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
	C10 - C36 Fraction (sum)	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
	C6 - C10 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	>C10 - C16 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
Total Recoverable Hydrocarbons	>C16 - C34 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C34 - C40 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C10 - C40 Fraction (sum)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	Benzene	µg/L	1	950	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Toluene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Ethylbenzene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	meta- & para-Xylene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
BTEXN	ortho-Xylene	µg/L	2	350	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Total Xylenes	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Sum of BTEX	µg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Naphthalene	µg/L	5	NG	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		

Year 3 construction/operation surface water quality results at impact site 3 (NC-IS50 DS/NO-IS50 DS)

	Parameter	Units	LOR	Guideline	22 Sep 2020 Dry	29 Oct 2020 Wet	30 Nov 2020 Dry	16 Dec 2020 Wet	22 Jan 2021 Dry	3 Feb 2021 Wet	17 Feb 2021 Dry	17 Mar 2021 Dry	21 Apr 2021 Dry	25 May 2021 Dry	17 Jun 2021 Dry	16 Jul 2021 Dry	25 Aug 2021 Wet	31 Aug 2021 Dry	29 Sep 2021 Dry	80th Percentile (pre- construction)	20th Percentile (pre- construction)
	Temperature	°C		NG	19.06	19.5	25.54	24.28	25.74	22.21	24.33	22.06	18.5	22.8	22.8	23.1	13.97	13.77	18.57	28.04	24.28
	Turbidity	NTU		<50	15.8	16.5	17.1	24.5	20.1	31.6	10.5	11.9	15	18.4	15.5	18.3	42.30	7.64	16.70	17.75	12.11
	Dissolved Oxygen	% saturation		85-110	95.1	83.8	107.2	88.1	90	85.6	93.7	90.7	91.4	91.3	90.7	92.1	95.27	94.70	88.53	93.2	84.7
	Electrical Conductivity	mS/cm		0.125-2.2	0.209	0.212	0.252	0.277	0.262	0.11	0.182	0.137	0.272	0.2	0.2	0.2	0.40	0.20	0.28	0.42	0.37
	Salinity	ppt		NG	95.1	83.8	107.2	88.1	90	85.6	93.7	90.7	91.4	91.3	90.7	92.1	95.27	94.70	88.53	0.18	0.17
	ORP	MV		NG	128	114	99	117	144	181	191	222	215	160.4	160.4	165.5	-185.40	-142.17	-32.50	205.1	134.11
	pH	pH units		6.5-8.5	7.18	7	7.35	7.48	7.03	7.45	7.57	7.24	7.36	7.3	7.4	7.3	8.03	7.15	6.90	7.65	7.42
	Total Dissolved Solids	mg/L	10	NG	119	129	142	177	156	70	108	74	156	126	182	126	221	121	152	236	226
	Suspended Solids	mg/L	5	50	15	14	8	15	10	16	8	8	6	<5	9	7	44	10	9	16	13
	Hydroxide Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Carbonate Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Bicarbonate Alkalinity as CaCO3	mg/L	1	NG	46	36	56	55	56	16	35	27	52	35	43	39	49	46	50	64	56
	Total Alkalinity as CaCO3	mg/L	1	NG	46	36	56	55	56	16	35	27	52	35	43	39	49	46	50	64	56
	Sulfate as SO4 - Turbidimetric	mg/L	1	NG	12	14	17	11	16	6	8	8	16	12	18	14	26	10	16	22	18
	Chloride	mg/L	1	NG	30	35	34	45	43	20	34	21	40	26	53	33	74	30	42	72	59
	Calcium	mg/L	1	NG	11	8	12	12	12	5	7	6	13	9	10	10	13	8	12	11	10
	Magnesium	mg/L	1	NG	6	6	7	8	8	3	4	4	8	5	7	6	9	6	7	8	7
	Sodium	mg/L	1	NG	20	23	26	30	28	13	21	14	28	17	30	22	47	18	26	49	47
	Potassium	mg/L	1	NG	3	4	4	4	4	2	2	2	4	2	3	3	6	3	4	5	5
Dissolved Metals	Aluminium	mg/L	0.01	0.055	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.01	0.02	<0.01	0.01	<0.01	0.06	0.04	0.034	0.018
	Antimony	mg/L	0.001	NG	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Arsenic	mg/L	0.001	0.024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Barium	mg/L	0.001	NG	0.026	0.023	0.03	0.031	0.027	0.013	0.017	0.018	0.031	0.025	0.025	0.020	0.029	0.02	0.026	0.037	0.034
	Cadmium	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Chromium	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001
	Copper	mg/L	0.001	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Lead	mg/L	0.001	0.0034	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Lithium	mg/L	0.001	NG	<0.001	0.002	0.002	0.003	0.002	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.007	0.006

	Manganese	mg/L	0.001	1.9	0.024	0.012	<0.001	0.002	<0.001	0.003	0.005	0.007	0.214	0.087	0.099	0.055	0.029	0.015	0.046	0.017	0.004
	Nickel	mg/L	0.001	0.011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001
	Selenium	mg/L	0.01	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
	Silver	mg/L	0.001	0.00005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Zinc	mg/L	0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	0.01
	Boron	mg/L	0.05	0.37	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
	Iron	mg/L	0.05	0.3	0.09	0.1	<0.05	<0.05	<0.05	0.11	0.1	0.08	0.24	0.17	0.20	0.14	0.06	0.18	0.23	0.0132	0.078
	Mercury	mg/L	0.0001	0.00006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Nitrite + Nitrate as N	mg/L	0.01	0.04	0.59	0.37	0.3	0.18	0.27	0.16	0.21	0.18	0.52	0.46	0.78	0.55	0.83	0.52	0.45	0.43	0.08
	Total Kjeldahl Nitrogen as N	mg/L	0.1	NG	0.4	0.3	0.3	0.4	0.4	0.2	0.3	0.2	0.3	0.3	0.4	0.4	0.6	0.3	0.4	0.5	0.4
	Total Nitrogen as N	mg/L	0.1	0.35	1.0	0.7	0.6	0.6	0.7	0.4	0.5	0.4	0.8	0.8	1.2	1.0	1.4	0.8	0.8	0.9	0.6
	Total Phosphorus as P	mg/L	0.01	0.025	<0.01	0.03	<0.01	<0.01	<0.01	0.01	0.02	<0.01	0.03	0.03	0.02	0.02	0.03	<0.01	0.02	0.04	0.02
	Total Anions	meq/L	0.01	NG	2.02	2	2.43	2.6	2.66	1.01	1.82	1.30	2.50	1.68	2.73	2.00	3.61	1.97	2.52	3.68	3.24
	Total Cations	meq/L	0.01	NG	1.99	2	2.41	2.66	2.58	1.11	1.64	1.29	2.63	1.65	2.46	2.03	3.59	1.75	2.41	3.64	3.29
	alpha-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Hexachlorobenzene (HCB)	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Organochlorine Pesticides	beta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	gamma-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	delta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor	µg/L	0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Aldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor epoxide	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	trans-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	alpha-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	cis-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4`-DDE	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	beta-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4`-DDD	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin aldehyde	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endosulfan sulfate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		

	4,4'-DDT	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Endrin ketone	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Methoxychlor	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Total Chlordane (sum)	µg/L	0.5	0.03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Sum of DDD + DDE + DDT	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Sum of Aldrin + Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Organophosphorus Pesticides	Dichlorvos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Demeton-S-methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Monocrotophos	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Dimethoate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Diazinon	µg/L	5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos-methyl	µg/L	0.5	0.001	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion-methyl	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Malathion	µg/L	0.5	0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenthion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion	µg/L	2	0.004	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Pirimphos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorfenvinphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Bromophos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenamiphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Prothiofos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Ethion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Carbophenothion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Azinphos Methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Polynuclear Aromatic Hydrocarbons	Naphthalene	µg/L	1	16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluorene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Phenanthrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		

	Fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(a)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Chrysene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(b+)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(k)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(a)pyrene	µg/L	1	NG	<0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.6	<0.5	<0.5		
	Indeno(1.2.3.cd)pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Dibenz(a,h)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(g,h,i)perylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Sum of polycyclic aromatic hydrocarbons	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Benzo(a)pyrene TEQ (zero)	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Total Detectable Hydrocarbons	C6 - C9 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	C10 - C14 Fraction	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
	C15 - C28 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	C29 - C36 Fraction	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
	C10 - C36 Fraction (sum)	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
Total Recoverable Hydrocarbons	C6 - C10 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	>C10 - C16 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C16 - C34 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C34 - C40 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C10 - C40 Fraction (sum)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		

	>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	Benzene	µg/L	1	950	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Toluene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
BTEX	Ethylbenzene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	meta- & para-Xylene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	ortho-Xylene	µg/L	2	350	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Total Xylenes	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Sum of BTEX	µg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Naphthalene	µg/L	5	NG	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		

Year 3 construction/operation surface water quality results at impact site 4 (SC-IS50 DS/SO-IS50 DS)

	Parameter	Units	LOR	Guideline	22 Sep 2020 Dry	29 Oct 2020 Wet	30 Nov 2020 Dry	16 Dec 2020 Wet	22 Jan 2021 Dry	3 Feb 2021 Wet	17 Feb 2021 Dry	17 Mar 2021 Dry	21 Apr 2021 Dry	25 May 2021 Dry	17 Jun 2021 Dry	16 Jul 2021 Dry	25 Aug 2021 Wet	31 Aug 2021 Dry	29 Sep 2021 Dry	80th Percentile (pre- construction)	20th Percentile (pre- construction)
	Temperature	°C		NG	19.16	19.24	25.75	24.27	25.78	22.28	24.47	22.09	18.59	20.6	18.7	19.4	13.50	13.20	17.77	28.04	24.51
	Turbidity	NTU		<50	14.7	16.8	15.8	22.5	16.1	34.1	9.9	10.7	15	21.7	16.0	17.6	65.47	8.24	13.03	15.46	11.79
	Dissolved Oxygen	% saturati on		85-110	91.3	83.4	86.5	93.7	94.2	86.4	94.2	94.4	97.2	93.3	91.1	86.9	90.57	105.80	96.67	92.94	71.69
	Electrical Conductivity	mS/cm		0.125-2.2	0.206	0.21	0.248	0.266	0.246	0.115	0.18	0.137	0.248	0.2	0.2	0.1	0.42	0.20	0.32	0.42	0.37
	Salinity	ppt		NG	0.1	0.1	0.12	0.13	0.12	0.05	0.08	0.06	0.12	0.1	0.1	0.1	0.24	0.09	0.15	0.18	0.17
	ORP	MV		NG	127	112	112	118	123	118	192	235	229	133.8	132.6	166	-249.33	-94.23	44.40	211.39	115.95
	pH	pH units		6.5-8.5	7.28	7.11	7.33	7.47	7.39	6.66	7.51	7.37	7.15	7.3	7.2	7.3	7.87	7.28	7.11	7.65	7.41
	Total Dissolved Solids	mg/L	10	NG	108	126	143	167	184	66	107	85	151	118	185	134	316	121	182	244	214
	Suspended Solids	mg/L	5	50	14	12	7	15	7	18	6	9	8	<5	8	8	43	8	12	15	7
	Hydroxide Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Carbonate Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Bicarbonate Alkalinity as CaCO3	mg/L	1	NG	44	36	55	66	51	18	36	25	53	37	43	39	56	41	50	64	54
	Total Alkalinity as CaCO3	mg/L	1	NG	44	36	55	66	51	18	36	25	53	37	43	39	56	41	50	64	54
	Sulfate as SO4 - Turbidimetric	mg/L	1	NG	12	13	17	17	15	7	8	8	16	13	18	15	51	10	20	22	18
	Chloride	mg/L	1	NG	29	36	34	43	39	21	33	21	37	28	56	33	111	29	50	72	57
	Calcium	mg/L	1	NG	11	8	13	12	12	5	6	6	12	9	10	10	17	9	13	11	10
	Magnesium	mg/L	1	NG	7	6	7	8	7	3	4	4	8	5	7	6	12	5	8	8	7
	Sodium	mg/L	1	NG	20	23	26	29	25	13	20	14	26	18	31	22	73	17	34	50	48
	Potassium	mg/L	1	NG	3	4	4	4	4	2	2	2	4	2	4	3	8	3	4	6	5
Discoloured Material	Aluminium	mg/L	0.01	0.055	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	0.02	<0.01	0.01	<0.01	0.06	0.04	0.02	0.018
	Antimony	mg/L	0.001	NG	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Arsenic	mg/L	0.001	0.024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Barium	mg/L	0.001	NG	0.026	0.023	0.03	0.029	0.027	0.014	0.019	0.020	0.031	0.024	0.029	0.021	0.029	0.02	0.028	0.035	0.034
	Cadmium	mg/L	0.0001																		
	Cadmium	mg/L	1	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Chromium	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Copper	mg/L	0.001	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Lead	mg/L	0.001	0.0034	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Lithium	mg/L	0.001	NG	<0.001	0.002	0.002	0.003	0.002	0.001	0.003	0.001	0.001	0.001	<0.001	0.001	0.003	0.001	0.002	0.006	0.006
	Manganese	mg/L	0.001	1.9	0.022	0.015	<0.001	<0.001	0.001	0.003	0.005	0.006	0.210	0.093	0.104	0.056	0.046	0.011	0.032	0.015	0.004
	Nickel	mg/L	0.001	0.011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.0016	0.001

Organochlorine Pesticides	Selenium	mg/L	0.01	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
	Silver	mg/L	0.001	0.00005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
	Zinc	mg/L	0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.013	0.013
	Boron	mg/L	0.05	0.37	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
	Iron	mg/L	0.05	0.3	0.09	0.11	<0.05	<0.05	<0.05	0.11	0.1	0.08	0.21	0.16	0.14	0.14	<0.05	0.17	0.19	0.07	0.07
	Mercury	mg/L	0.0001	0.00006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
	Nitrite + Nitrate as N	mg/L	0.01	0.04	0.58	0.36	0.3	0.18	0.26	0.17	0.22	0.18	0.50	0.48	0.77	0.55	1.25	0.54	0.58	0.51	0.11
	Total Kjeldahl Nitrogen as N	mg/L	0.1	NG	0.4	0.4	0.3	0.3	0.4	0.2	0.3	0.2	0.3	0.3	0.4	0.4	0.7	0.4	0.4	0.4	0.3
	Total Nitrogen as N	mg/L	0.1	0.35	1.0	0.8	0.6	0.5	0.7	0.4	0.5	0.4	0.8	0.8	1.2	1.0	2	0.9	1	0.9	0.6
	Total Phosphorus as P	mg/L	0.01	0.025	<0.01	0.02	<0.01	0.04	<0.01	0.02	0.02	0.01	0.04	0.04	0.03	0.02	0.12	0.02	0.02	0.2	0.02
	Total Anions	meq/L	0.01	NG	1.95	2	2.41	2.88	2.43	1.10	1.82	1.26	2.44	1.80	2.81	2.02	5.31	1.84	2.82	3.68	3.16
	Total Cations	meq/L	0.01	NG	2.07	2	2.46	2.62	2.36	1.11	1.55	1.29	2.49	1.69	2.52	2.03	5.22	1.68	2.89	3.51	3.34
	alpha-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Hexachlorobenzene (HCB)	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	beta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	gamma-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	delta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor	µg/L	0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Aldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Heptachlor epoxide	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	trans-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	alpha-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	cis-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4'-DDE	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	beta-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4'-DDD	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endrin aldehyde	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Endosulfan sulfate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	4,4'-DDT	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Endrin ketone	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Methoxychlor	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Total Chlordane (sum)	µg/L	0.5	0.03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		

	Sum of DDD + DDE + DDT	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Sum of Aldrin + Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Organophosphorus Pesticides	Dichlorvos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Demeton-S-methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Monocrotophos	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Dimethoate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Diazinon	µg/L	5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos-methyl	µg/L	0.5	0.001	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion-methyl	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Malathion	µg/L	0.5	0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenthion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorpyrifos	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Parathion	µg/L	2	0.004	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
	Pirimphos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Chlorfenvinphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Bromophos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Fenamiphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Prothiofos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Ethion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Carbophenothion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Azinphos Methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Polycyclic Aromatic Hydrocarbons	Naphthalene	µg/L	1	16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Acenaphthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluorene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Phenanthrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benz(a)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Chrysene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(b+j)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(k)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(a)pyrene	µg/L	1	NG	<0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.6	<0.5	<0.5	<0.5		
	Indeno(1.2.3.cd)pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		

	Dibenz(a,h)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Benzo(g,h,i)perylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
	Sum of polycyclic aromatic hydrocarbons	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Benzo(a)pyrene TEQ (zero)	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	C6 - C9 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
Total Detectable Hydrocarbons	C10 - C14 Fraction	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
	C15 - C28 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	C29 - C36 Fraction	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
	C10 - C36 Fraction (sum)	µg/L	50	NG	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
Total Recoverable Hydrocarbons	C6 - C10 Fraction	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	>C10 - C16 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C16 - C34 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C34 - C40 Fraction	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C10 - C40 Fraction (sum)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	100	NG	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
	Benzene	µg/L	1	950	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Toluene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
BTEXN	Ethylbenzene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	meta- & para-Xylene	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	ortho-Xylene	µg/L	2	350	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Total Xylenes	µg/L	2	NG	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
	Sum of BTEX	µg/L	1	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	Naphthalene	µg/L	5	NG	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		

Year 3 construction/operation surface water quality results at control site 1 (NC-CS1/NO-CS2)

	Parameter	Units	LOR	Guideline	29 Oct 2020 Wet	16 Dec 2020 Wet	03 Feb 2021 Wet	25 Aug 2021 Wet
	Temperature	°C		NG	19.41	24.24	22.6	13.83
	Turbidity	NTU		<50	17.7	23.2	32.4	38.60
	Dissolved Oxygen	% saturation		85-110	80.6	111	89.1	99.57
	Electrical Conductivity	mS/cm		0.125-2.2	0.206	0.272	0.106	0.41
	Salinity	ppt		NG	0.1	0.13	0.05	0.20
	ORP	MV		NG	84	109	139	-200.23
	pH	pH units		6.5-8.5	7.09	7.51	7.59	8.66
	Total Dissolved Solids	mg/L	10	NG	127	158	75	230
	Suspended Solids	mg/L	5	50	15	16	19	27
	Hydroxide Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1
	Carbonate Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1
	Bicarbonate Alkalinity as CaCO3	mg/L	1	NG	36	58	17	54
	Total Alkalinity as CaCO3	mg/L	1	NG	36	58	17	54
	Sulfate as SO4 - Turbidimetric	mg/L	1	NG	14	17	6	26
	Chloride	mg/L	1	NG	33	48	20	76
	Calcium	mg/L	1	NG	8	12	4	12
	Magnesium	mg/L	1	NG	6	8	3	9
Dissolved Metals	Sodium	mg/L	1	NG	22	30	12	46
	Potassium	mg/L	1	NG	4	4	2	6
	Aluminium	mg/L	0.01	0.055	<0.01	<0.01	0.03	<0.01
	Antimony	mg/L	0.001	NG	<0.001	<0.001	<0.001	<0.001
	Arsenic	mg/L	0.001	0.024	<0.001	<0.001	<0.001	<0.001
	Barium	mg/L	0.001	NG	0.023	0.03	0.013	0.027
	Cadmium	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001
	Copper	mg/L	0.001	0.0014	<0.001	<0.001	<0.001	<0.001
	Lead	mg/L	0.001	0.0034	<0.001	<0.001	<0.001	<0.001
	Lithium	mg/L	0.001	NG	0.002	0.003	0.001	0.002
	Manganese	mg/L	0.001	1.9	0.012	0.001	0.004	0.034
	Nickel	mg/L	0.001	0.011	<0.001	<0.001	<0.001	<0.001
	Selenium	mg/L	0.01	0.005	<0.01	<0.01	<0.01	<0.01
	Silver	mg/L	0.001	0.00005	<0.001	<0.001	<0.001	<0.001
	Zinc	mg/L	0.005	0.008	<0.005	<0.005	<0.005	<0.005
	Boron	mg/L	0.05	0.37	<0.05	<0.05	<0.05	<0.05
	Iron	mg/L	0.05	0.3	0.11	<0.05	0.11	0.06
	Mercury	mg/L	0.0001	0.00006	<0.0001	<0.0001	<0.0001	<0.0001
	Nitrite + Nitrate as N	mg/L	0.01	0.04	0.35	0.21	0.16	0.82
	Total Kjeldahl Nitrogen as N	mg/L	0.1	NG	0.3	0.4	0.2	0.6
	Total Nitrogen as N	mg/L	0.1	0.35	0.6	0.6	0.4	1.4
	Total Phosphorus as P	mg/L	0.01	0.025	0.03	0.02	0.02	0.05
	Total Anions	meq/L	0.01	NG	1.94	2.87	1.03	3.76
Organoc hlorine Pesticide	Total Cations	meq/L	0.01	NG	1.95	2.66	1.02	3.49
	alpha-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Hexachlorobenzene (HCB)	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	beta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	gamma-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5

	delta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Heptachlor	µg/L	0.5	0.8	<0.5	<0.5	<0.5	<0.5
	Aldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Heptachlor epoxide	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	trans-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	alpha-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	cis-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	4,4´-DDE	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Endrin	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5
	beta-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	4,4´-DDD	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Endrin aldehyde	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Endosulfan sulfate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	4,4´-DDT	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0
	Endrin ketone	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Methoxychlor	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0
	Total Chlordane (sum)	µg/L	0.5	0.03	<0.5	<0.5	<0.5	<0.5
	Sum of DDD + DDE + DDT	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Sum of Aldrin + Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
Organophosphorus Pesticides	Dichlorvos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Demeton-S-methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Monocrotophos	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0
	Dimethoate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Diazinon	µg/L	5	NG	<0.5	<0.5	<0.5	<0.5
	Chlorpyrifos-methyl	µg/L	0.5	0.001	<0.5	<0.5	<0.5	<0.5
	Parathion-methyl	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0
	Malathion	µg/L	0.5	0.05	<0.5	<0.5	<0.5	<0.5
	Fenthion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Chlorpyrifos	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5
	Parathion	µg/L	2	0.004	<2.0	<2.0	<2.0	<2.0
	Pirimphos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Chlorfenvinphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Bromophos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Fenamiphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Prothiofos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Ethion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Carbophenothion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Azinphos Methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
Polynuclear Aromatic Hydrocarbons	Naphthalene	µg/L	1	16	<1.0	<1.0	<1.0	<1.0
	Acenaphthylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Acenaphthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Fluorene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Phenanthrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Benz(a)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Chrysene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0

	Benzo(b+j)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Benzo(k)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Benzo(a)pyrene	µg/L	1	NG	<0.6	<0.5	<0.5	<0.5
	Indeno(1.2.3.cd)pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Dibenz(a.h)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Benzo(g,h,i)perylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Sum of polycyclic aromatic hydrocarbons	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ (zero)	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5
Total Petroleum Hydrocarbons	C6 - C9 Fraction	µg/L	20	NG	<20	<20	<20	<20
	C10 - C14 Fraction	µg/L	50	NG	<50	<50	<50	<50
	C15 - C28 Fraction	µg/L	100	NG	<100	<100	<100	<100
	C29 - C36 Fraction	µg/L	50	NG	<50	<50	<50	<50
	C10 - C36 Fraction (sum)	µg/L	50	NG	<50	<50	<50	<50
Total recoverable Hydrocarbons	C6 - C10 Fraction	µg/L	20	NG	<20	<20	<20	<20
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20	NG	<20	<20	<20	<20
	>C10 - C16 Fraction	µg/L	100	NG	<100	<100	<100	<100
	>C16 - C34 Fraction	µg/L	100	NG	<100	<100	<100	<100
	>C34 - C40 Fraction	µg/L	100	NG	<100	<100	<100	<100
	>C10 - C40 Fraction (sum)	µg/L	100	NG	<100	<100	<100	<100
	>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	100	NG	<100	<100	<100	<100
BTEXN	Benzene	µg/L	1	950	<1	<1	<1	<1
	Toluene	µg/L	2	NG	<2	<2	<2	<2
	Ethylbenzene	µg/L	2	NG	<2	<2	<2	<2
	meta- & para-Xylene	µg/L	2	NG	<2	<2	<2	<2
	ortho-Xylene	µg/L	2	350	<2	<2	<2	<2
	Total Xylenes	µg/L	2	NG	<2	<2	<2	<2
	Sum of BTEX	µg/L	1	NG	<1	<1	<1	<1
	Naphthalene	µg/L	5	NG	<5	<5	<5	<5

Year 3 construction surface water quality results at control site 2 (SC-CS2/SO-CS2)

	Parameter	Units	LOR	Guideline	29 Oct 2020 Wet	16 Dec 2020 Wet	03 Feb 2021 Wet	25 Aug 2021 Wet
	Temperature	°C		NG	19.05	24.33	20.1	13.50
	Turbidity	NTU		<50	17.7	25.5	33.7	58.70
	Dissolved Oxygen	% saturation		85-110	85.8	88.6	87.3	97.37
	Electrical Conductivity	mS/cm		0.125-2.2	0.198	0.26	0.105	0.52
	Salinity	ppt		NG	0.1	0.12	0.02	0.25
	ORP	MV		NG	115	116	135	-272.10
	pH	pH units		6.5-8.5	7.21	7.5	7.23	8.57
	Total Dissolved Solids	mg/L	10	NG	114	150	70	294
	Suspended Solids	mg/L	5	50	14	13	16	40
	Hydroxide Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1
	Carbonate Alkalinity as CaCO3	mg/L	1	NG	<1	<1	<1	<1
	Bicarbonate Alkalinity as CaCO3	mg/L	1	NG	32	54	17	54
	Total Alkalinity as CaCO3	mg/L	1	NG	32	54	17	54
	Sulfate as SO4 - Turbidimetric	mg/L	1	NG	12	16	7	33
	Chloride	mg/L	1	NG	33	42	21	106
	Calcium	mg/L	1	NG	7	12	5	14
	Magnesium	mg/L	1	NG	6	8	3	10
	Sodium	mg/L	1	NG	22	28	13	61
	Potassium	mg/L	1	NG	7	12	5	14
Dissolved Metals	Aluminium	mg/L	0.01	0.055	<0.01	<0.01	0.03	<0.01
	Antimony	mg/L	0.001	NG	<0.001	<0.001	<0.001	<0.001
	Arsenic	mg/L	0.001	0.024	<0.001	<0.001	<0.001	<0.001
	Barium	mg/L	0.001	NG	0.022	0.029	0.013	0.03
	Cadmium	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001
	Copper	mg/L	0.001	0.0014	<0.001	<0.001	<0.001	<0.001
	Lead	mg/L	0.001	0.0034	<0.001	<0.001	<0.001	<0.001
	Lithium	mg/L	0.001	NG	0.002	0.003	0.001	0.002
	Manganese	mg/L	0.001	1.9	0.017	<0.001	0.004	0.039
	Nickel	mg/L	0.001	0.011	<0.001	<0.001	<0.001	<0.001
	Selenium	mg/L	0.01	0.005	<0.01	<0.01	<0.01	<0.01
	Silver	mg/L	0.001	0.00005	<0.001	<0.001	<0.001	<0.001
	Zinc	mg/L	0.005	0.008	<0.005	<0.005	0.025	<0.005
	Boron	mg/L	0.05	0.37	<0.05	<0.05	<0.05	<0.05
	Iron	mg/L	0.05	0.3	0.12	<0.05	0.13	<0.05
	Mercury	mg/L	0.0001	0.00006	<0.0001	<0.0001	<0.0001	<0.0001
	Nitrite + Nitrate as N	mg/L	0.01	0.04	0.33	0.21	0.16	0.97
	Total Kjeldahl Nitrogen as N	mg/L	0.1	NG	0.3	0.4	0.2	0.7
	Total Nitrogen as N	mg/L	0.1	0.35	0.6	0.6	0.4	1.7
	Total Phosphorus as P	mg/L	0.01	0.025	0.01	0.01	0.02	0.06
	Total Anions	meq/L	0.01	NG	1.82	2.6	1.08	4.76
	Total Cations	meq/L	0.01	NG	1.88	2.58	1.11	4.35
	alpha-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
Organoc hlorine	Hexachlorobenzene (HCB)	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	beta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	gamma-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5

	delta-BHC	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Heptachlor	µg/L	0.5	0.8	<0.5	<0.5	<0.5	<0.5
	Aldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Heptachlor epoxide	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	trans-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	alpha-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	cis-Chlordane	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	4,4`-DDE	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Endrin	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5
	beta-Endosulfan	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	4,4`-DDD	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Endrin aldehyde	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Endosulfan sulfate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	4,4`-DDT	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0
	Endrin ketone	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Methoxychlor	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0
	Total Chlordane (sum)	µg/L	0.5	0.03	<0.5	<0.5	<0.5	<0.5
	Sum of DDD + DDE + DDT	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Sum of Aldrin + Dieldrin	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
Organophosphorus Pesticides	Dichlorvos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Demeton-S-methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Monocrotophos	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0
	Dimethoate	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Diazinon	µg/L	5	NG	<0.5	<0.5	<0.5	<0.5
	Chlorpyrifos-methyl	µg/L	0.5	0.001	<0.5	<0.5	<0.5	<0.5
	Parathion-methyl	µg/L	2	NG	<2.0	<2.0	<2.0	<2.0
	Malathion	µg/L	0.5	0.05	<0.5	<0.5	<0.5	<0.5
	Fenthion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Chlorpyrifos	µg/L	0.5	0.01	<0.5	<0.5	<0.5	<0.5
	Parathion	µg/L	2	0.004	<2.0	<2.0	<2.0	<2.0
	Pirimphos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Chlorfenvinphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Bromophos-ethyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Fenamiphos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Prothiofos	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Ethion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Carbophenothion	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
	Azinphos Methyl	µg/L	0.5	NG	<0.5	<0.5	<0.5	<0.5
Polynuclear Aromatic Hydrocarbons	Naphthalene	µg/L	1	16	<1.0	<1.0	<1.0	<1.0
	Acenaphthylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Acenaphthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Fluorene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Phenanthrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Benz(a)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Chrysene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0

	Benzo(b+j)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Benzo(k)fluoranthene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Benzo(a)pyrene	µg/L	1	NG	<0.6	<0.5	<0.5	<0.5
	Indeno(1.2.3.cd)pyrene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Dibenz(a.h)anthracene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Benzo(g,h,i)perylene	µg/L	1	NG	<1.0	<1.0	<1.0	<1.0
	Sum of polycyclic aromatic hydrocarbons	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ (zero)	µg/L	1	NG	<0.5	<0.5	<0.5	<0.5
Total Petroleum Hydrocarbons	C6 - C9 Fraction	µg/L	20	NG	<20	<20	<20	<20
	C10 - C14 Fraction	µg/L	50	NG	<50	<50	<50	<50
	C15 - C28 Fraction	µg/L	100	NG	<100	<100	<100	<100
	C29 - C36 Fraction	µg/L	50	NG	<50	<50	<50	<50
	C10 - C36 Fraction (sum)	µg/L	50	NG	<50	<50	<50	<50
Total recoverable Hydrocarbons	C6 - C10 Fraction	µg/L	20	NG	<20	<20	<20	<20
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20	NG	<20	<20	<20	<20
	>C10 - C16 Fraction	µg/L	100	NG	<100	<100	<100	<100
	>C16 - C34 Fraction	µg/L	100	NG	<100	<100	<100	<100
	>C34 - C40 Fraction	µg/L	100	NG	<100	<100	<100	<100
	>C10 - C40 Fraction (sum)	µg/L	100	NG	<100	<100	<100	<100
	>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	100	NG	<100	<100	<100	<100
BTEXN	Benzene	µg/L	1	950	<1	<1	<1	<1
	Toluene	µg/L	2	NG	<2	<2	<2	<2
	Ethylbenzene	µg/L	2	NG	<2	<2	<2	<2
	meta- & para-Xylene	µg/L	2	NG	<2	<2	<2	<2
	ortho-Xylene	µg/L	2	350	<2	<2	<2	<2
	Total Xylenes	µg/L	2	NG	<2	<2	<2	<2
	Sum of BTEX	µg/L	1	NG	<1	<1	<1	<1
	Naphthalene	µg/L	5	NG	<5	<5	<5	<5

2. Groundwater

Year 3 construction/operation groundwater quality results at reference borehole – shallow (NC-RBH01A/NO-RBH01A) (referred to as NC-RBH01S in preconstruction monitoring report)

Parameter	Units	Guideline	Nov 2020	Feb 2021	May 2021	Sep 2021	80th Percentile (pre- construction)	20th Percentile (pre- construction)
Temperature	°C	NG	19.48	19.34	19.3	20.4	21.51	18.86
Turbidity	NTU	<50	24.31	22.73	30.9	52.2	32.8	25.4
Dissolved Oxygen	% saturation	85-110	69.6	77.61	66.3	49.9	89.3	31.7
Electrical Conductivity	mS/cm	0.125-2.2	0.701	0.689	0.7	0.552	0.78	0.648
Salinity	ppt	NG	0.32	0.286	0.3	0.27	0.36	0.29
ORP	MV	NG	-49	-44	-66.9	25.3	-72	-24.6
pH	pH units	6.5-8.5	7.11	6.94	6.9	5.83	7.02	6.53

Year 3 construction/operation groundwater quality results at reference borehole – deep (NC-RBH01B/NO-RBH01B) (referred to as NC-RBH01D in preconstruction monitoring report)

Parameter	Units	Guideline	Nov 2020	Feb 2021	May 2021	Sep 2021	80th Percentile (pre- construction)	20th Percentile (pre- construction)
Temperature	°C	NG	19.74	20.5	19.4	20	21.47	18.99
Turbidity	NTU	<50	22.3	24.7	21.5	52.7	33.6	15.6
Dissolved Oxygen	% saturation	85-110	88.6	83.3	70.8	18.1	65.3	30
Electrical Conductivity	mS/cm	0.125-2.2	0.687	0.445	0.5	0.709	0.67	0.477
Salinity	ppt	NG	0.25	0.3	0.2	0.35	43	-65
ORP	MV	NG	-75.4	-84	4.2	-20.8	0.34	0.21
pH	pH units	6.5-8.5	7.08	7.18	6.8	5.81	7.12	6.43

Year 3 construction/operation groundwater quality results at north bank borehole – shallow (NC-BH02A/NO-BH02A)

Parameter	Units	Guideline	Nov 2020	Feb 2021	May 2021	Sep 2021
Temperature	°C	NG	19.45	20.6	19.2	20.4
Turbidity	NTU	<50	30.21	35.3	51.0	37.3
Dissolved Oxygen	% saturation	85-110	102.5	89.5	90.3	15.6
Electrical Conductivity	mS/cm	0.125-2.2	0.487	0.378	0.4	0.16
Salinity	ppt	NG	0.28	0.32	0.3	0.08
ORP	MV	NG	-102	-89	-48.4	47.3
pH	pH units	6.5-8.5	7.31	7.22	6.8	5.41

Year 3 construction/operation groundwater quality results at north bank borehole – deep (NC-BH02B/NO-BH02B)

Parameter	Units	Guideline	Nov 2020	Feb 2021	May 2021	Sep 2021
Temperature	°C	NG	20.01	22.3	19.6	19.4
Turbidity	NTU	<50	55.32	29	87.0	54.7
Dissolved Oxygen	% saturation	85-110	112.6	95.9	68.6	24.1
Electrical Conductivity	mS/cm	0.125-2.2	0.487	0.289	0.5	0.304
Salinity	ppt	NG	0.23	0.27	0.2	0.15
ORP	MV	NG	-78.2	-79	-43.2	142.8
pH	pH units	6.5-8.5	7.09	7.1	6.6	3.29

Year 3 construction/operation groundwater quality results at south bank borehole (SC-BH01/SO-BH01)

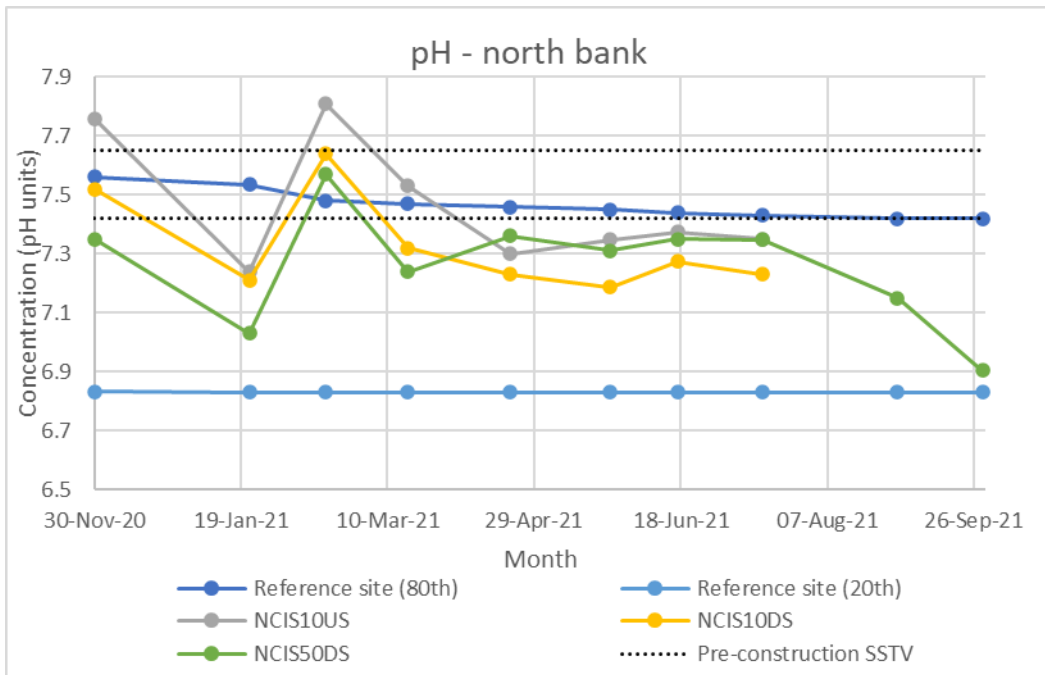
Parameter	Units	Guideline	Nov 2020	Feb 2021	May 2021
Temperature	* C	NG	19.93	20.6	19.5
Turbidity	NTU	<50	262	102	210.0
Dissolved Oxygen	% saturation	85-110	65.4	82	65.0
Electrical Conductivity	mS/cm	0.125-2.2	0.589	0.643	0.9
Salinity	ppt	NG	0.3	0.36	0.5
ORP	MV	NG	102.8	-105	-10.3
pH	pH units	6.5-8.5	7.34	7.27	7.3

Appendix D. Surface and Groundwater Relevant Plots

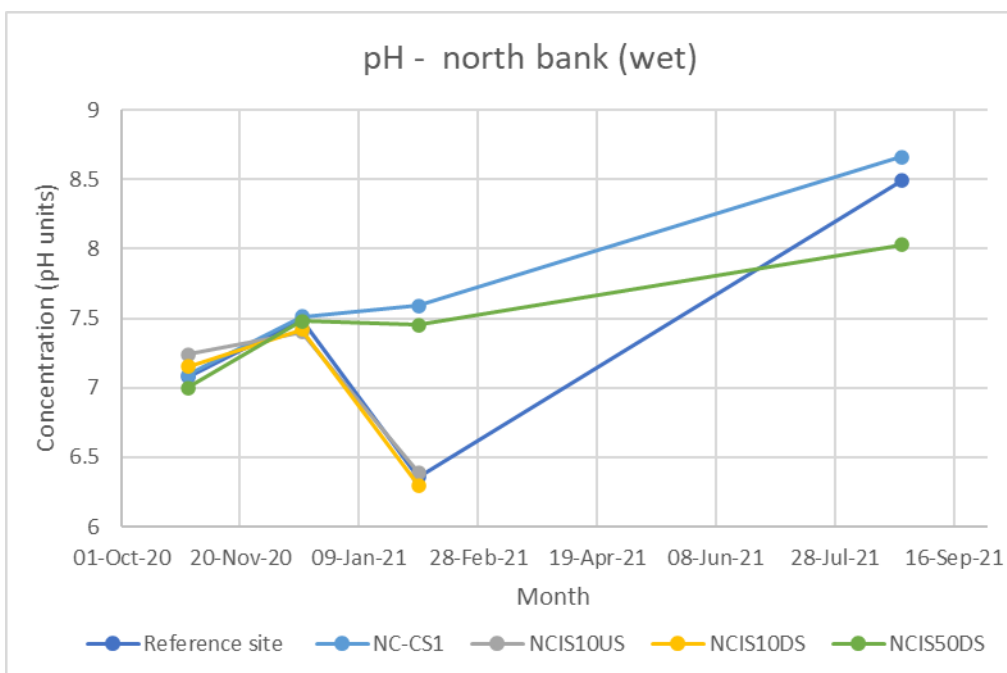
1. Surface Water

1.1 pH

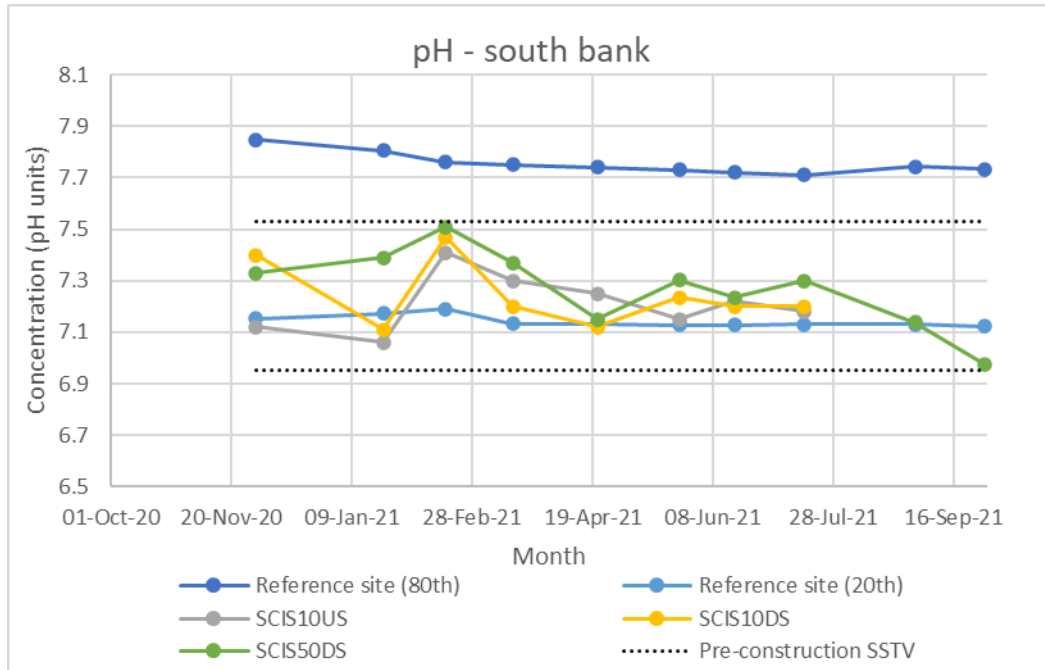
North Bank - Dry Weather



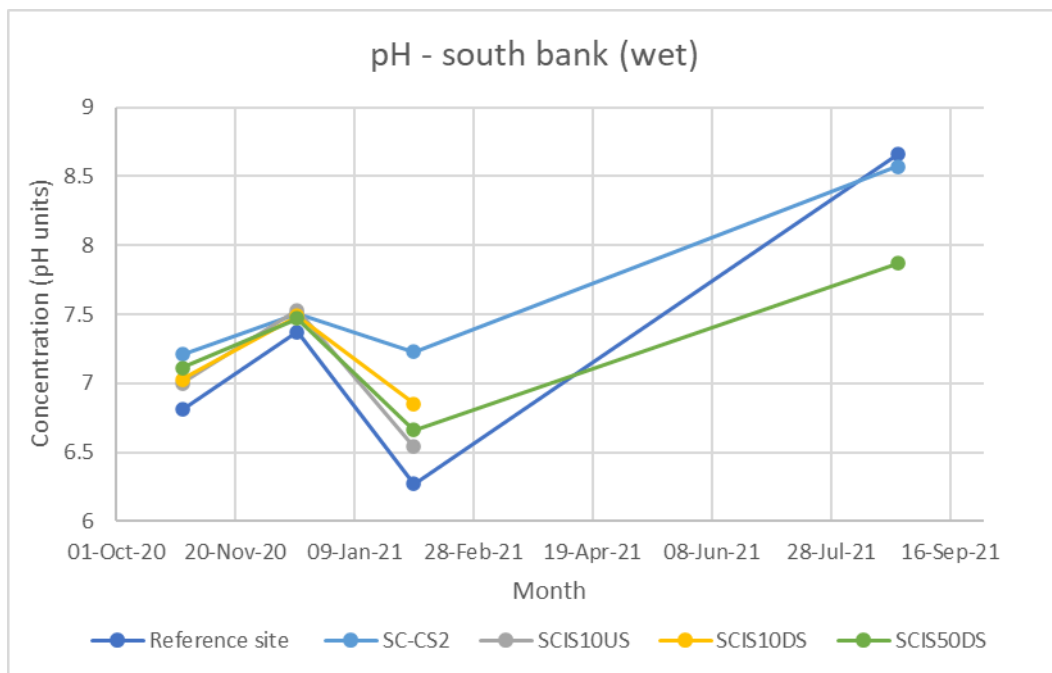
North Bank - Wet Weather



South Bank - Dry Weather

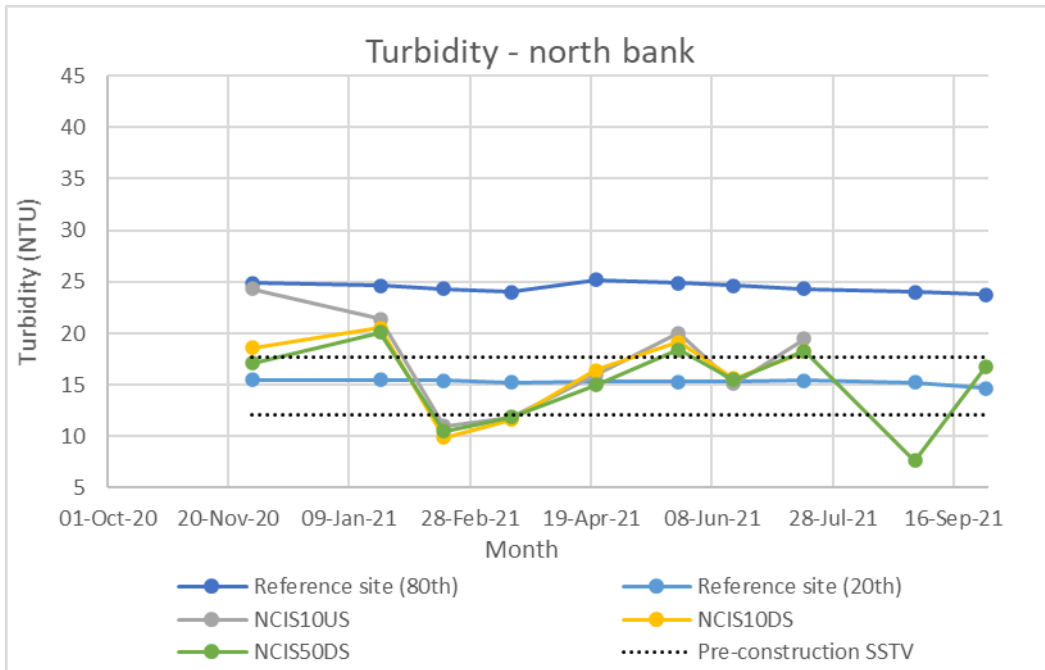


South Bank - Wet Weather

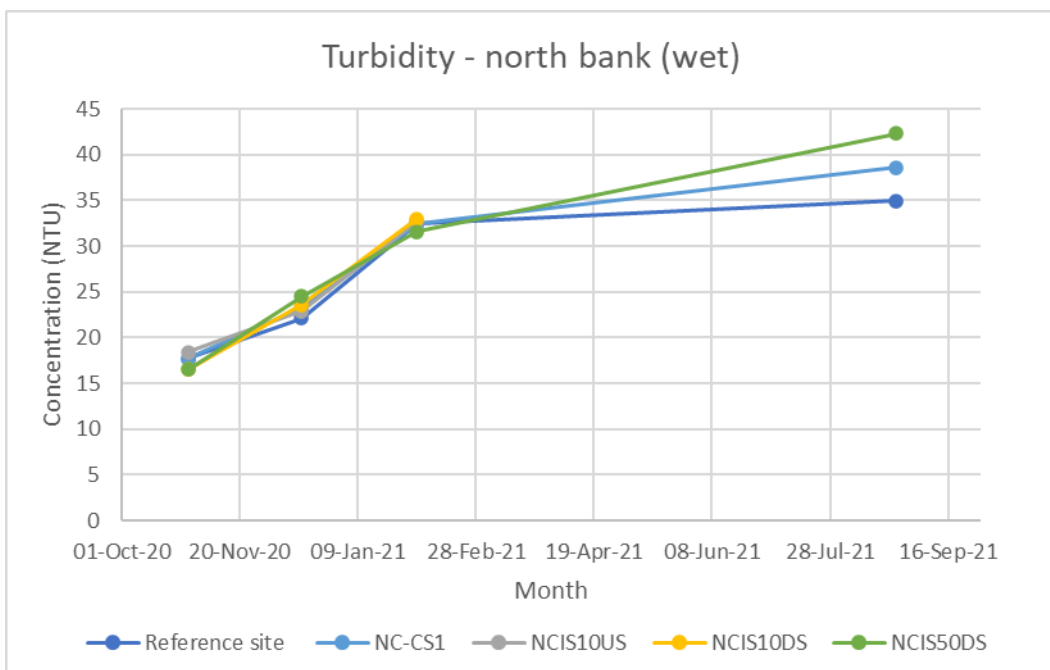


1.2 Turbidity

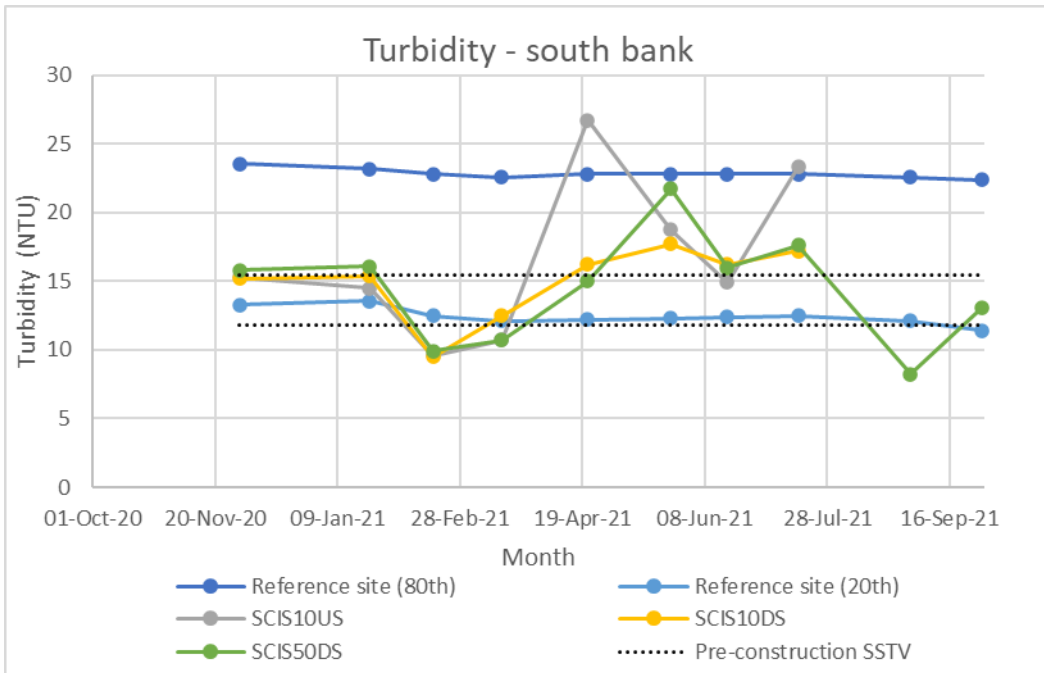
North Bank - Dry Weather



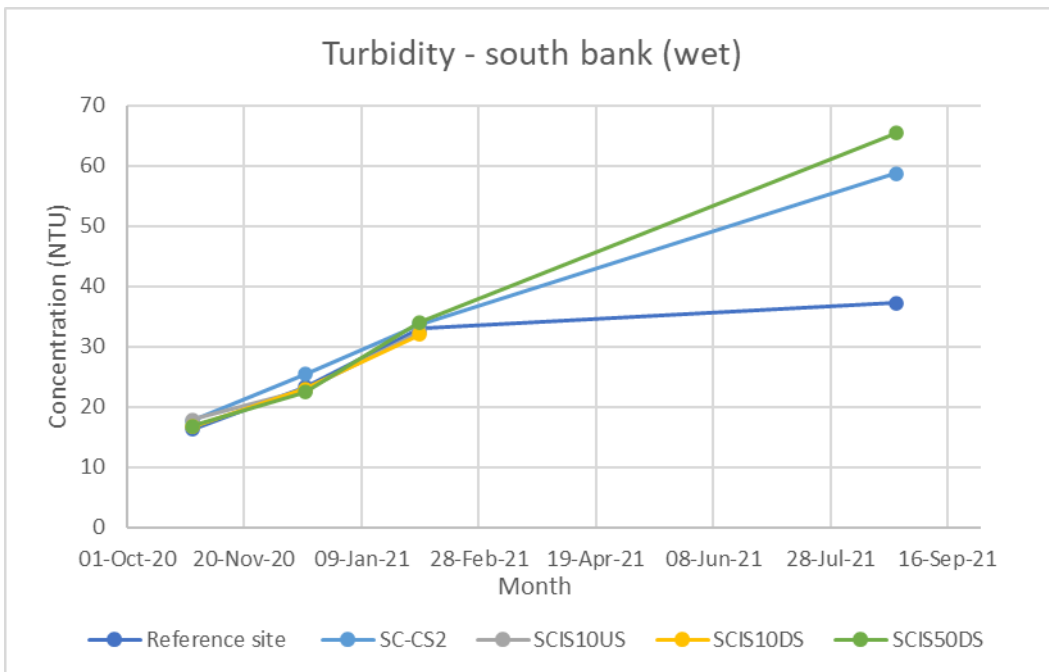
North Bank - Wet Weather



South Bank - Dry Weather

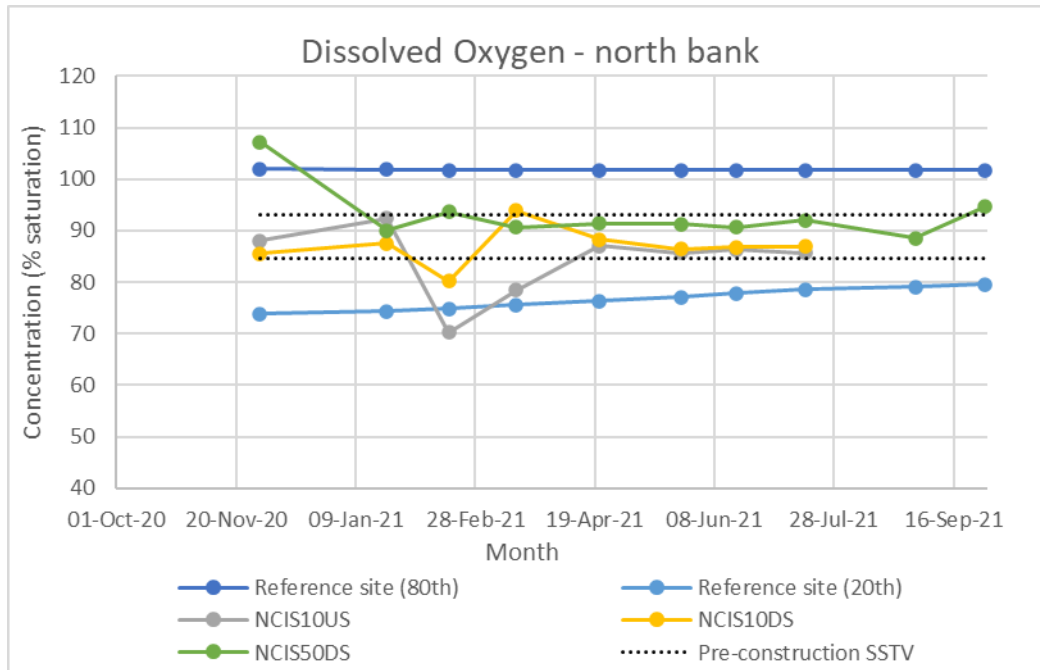


South Bank - Wet Weather

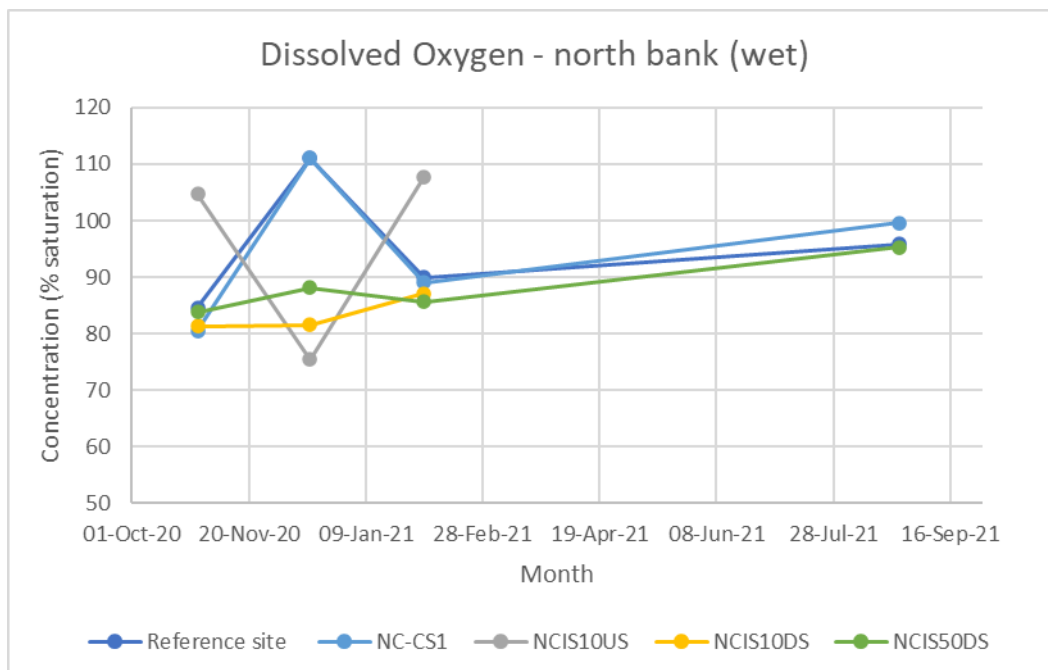


1.3 Dissolved Oxygen

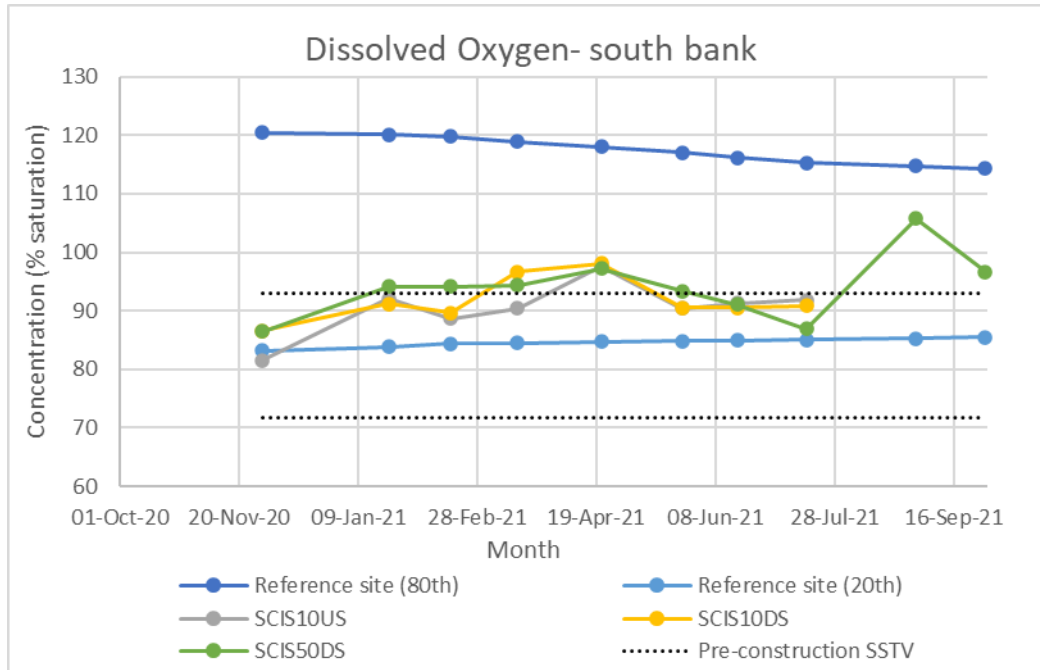
North Bank - Dry Weather



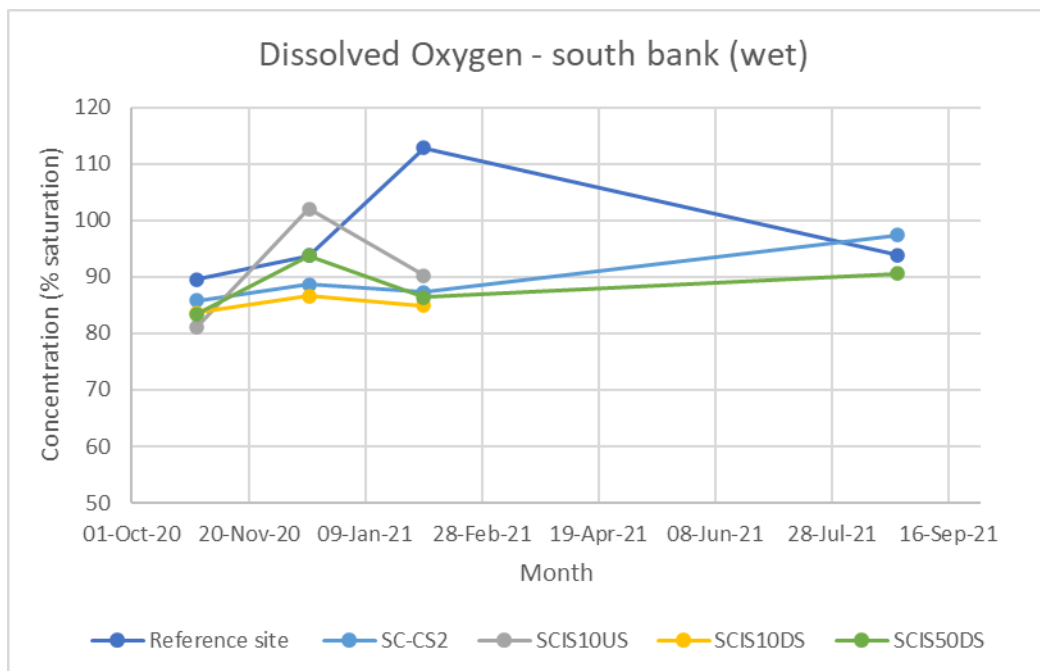
North Bank - Wet Weather



South Bank - Dry Weather

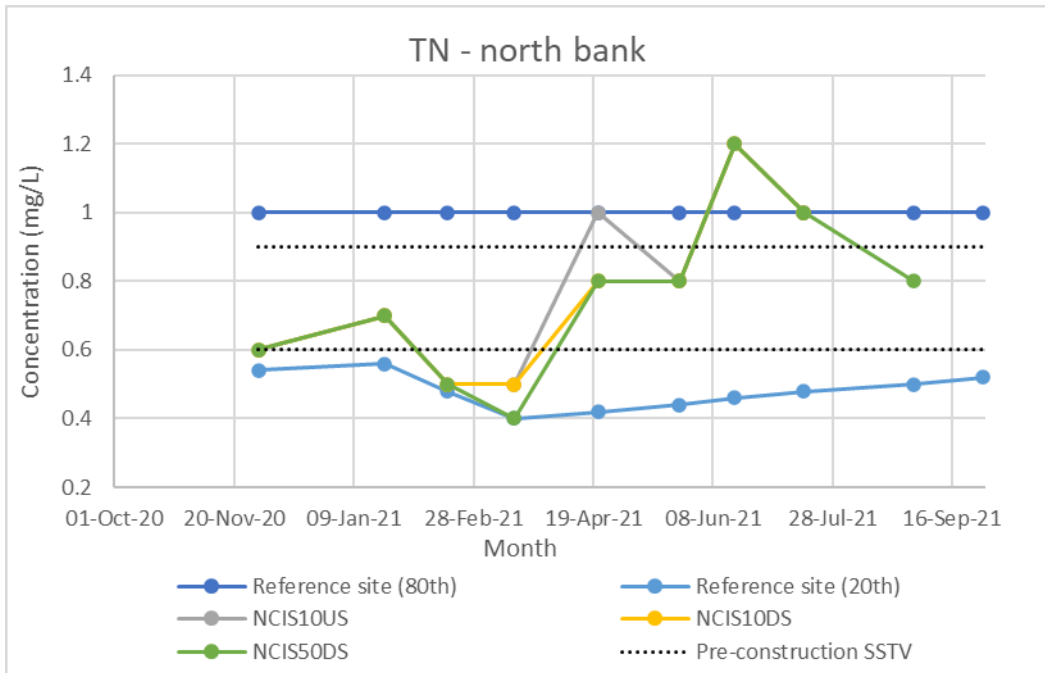


South Bank - Wet Weather

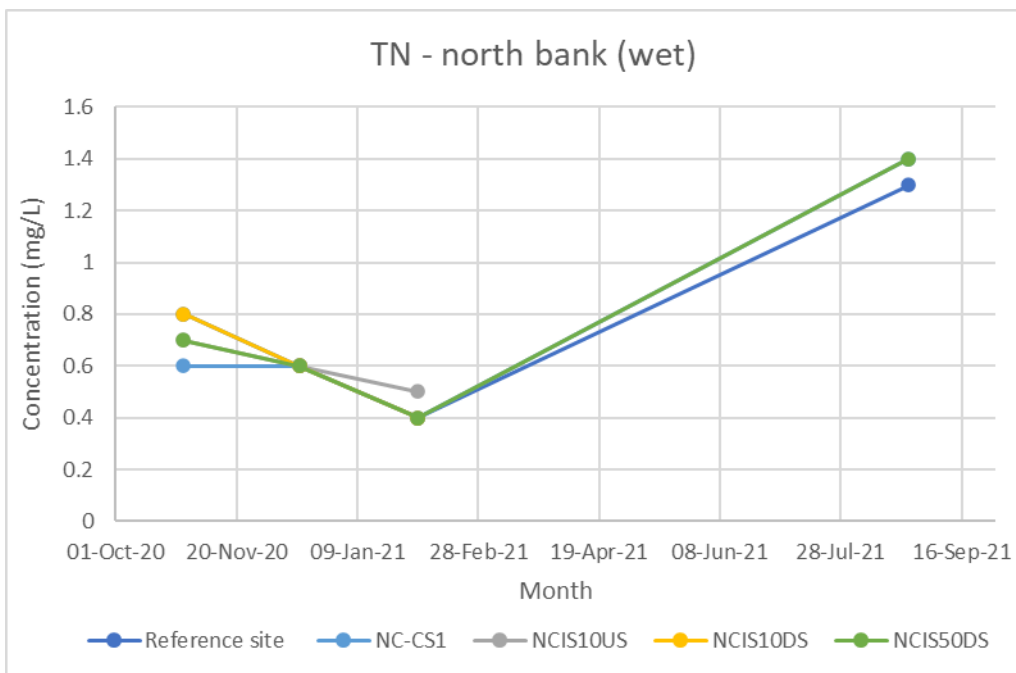


1.4 Total Nitrogen

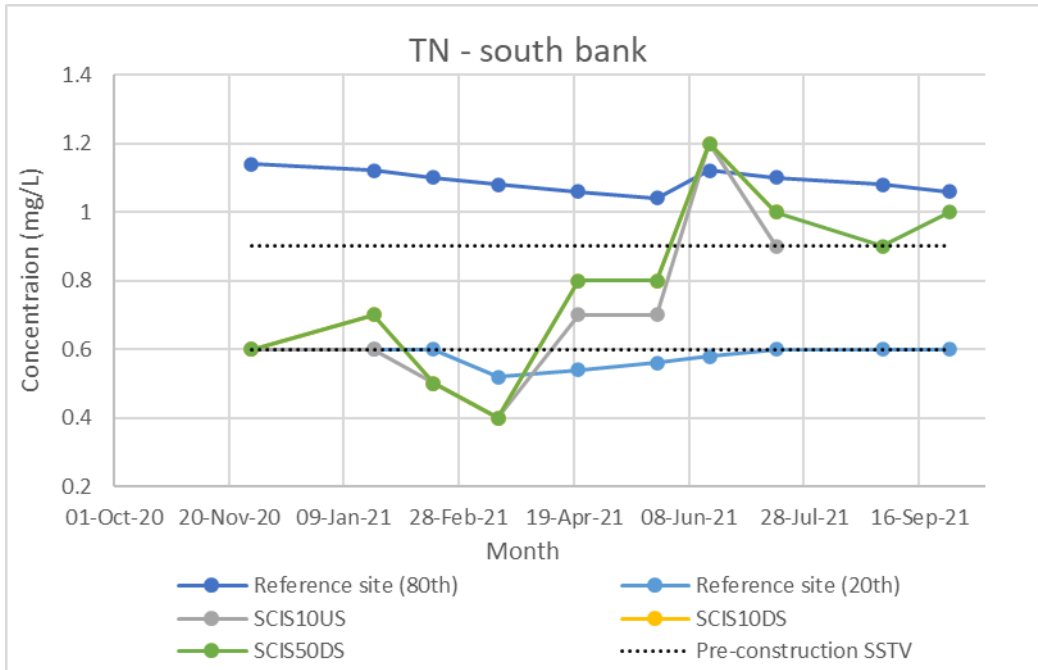
North Bank - Dry Weather



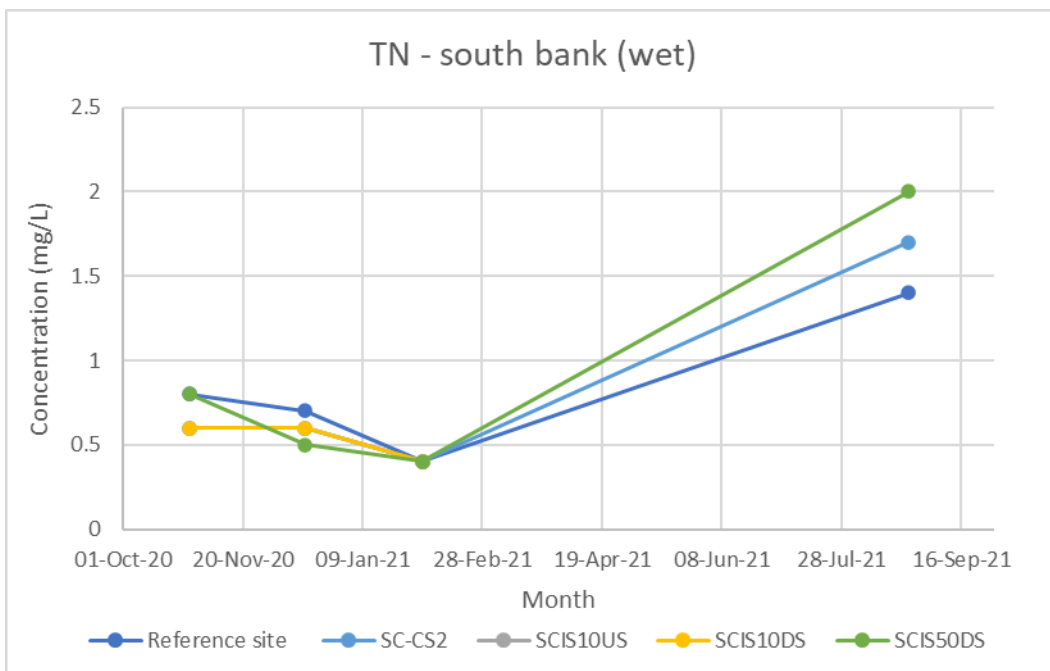
North Bank - Wet Weather



South Bank - Dry Weather

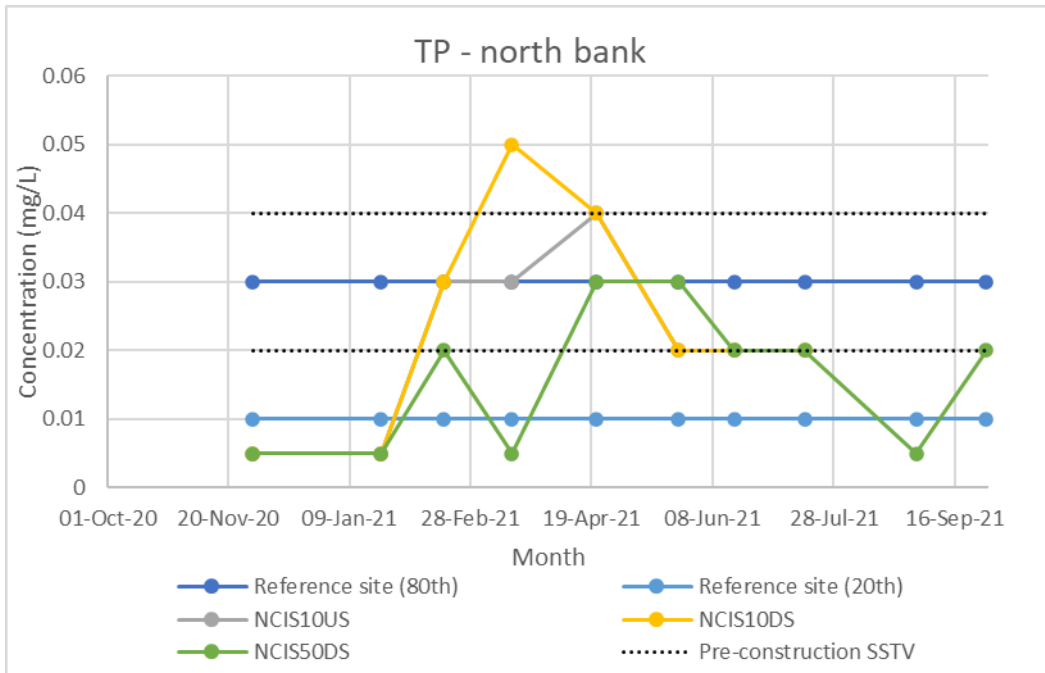


South Bank - Wet Weather

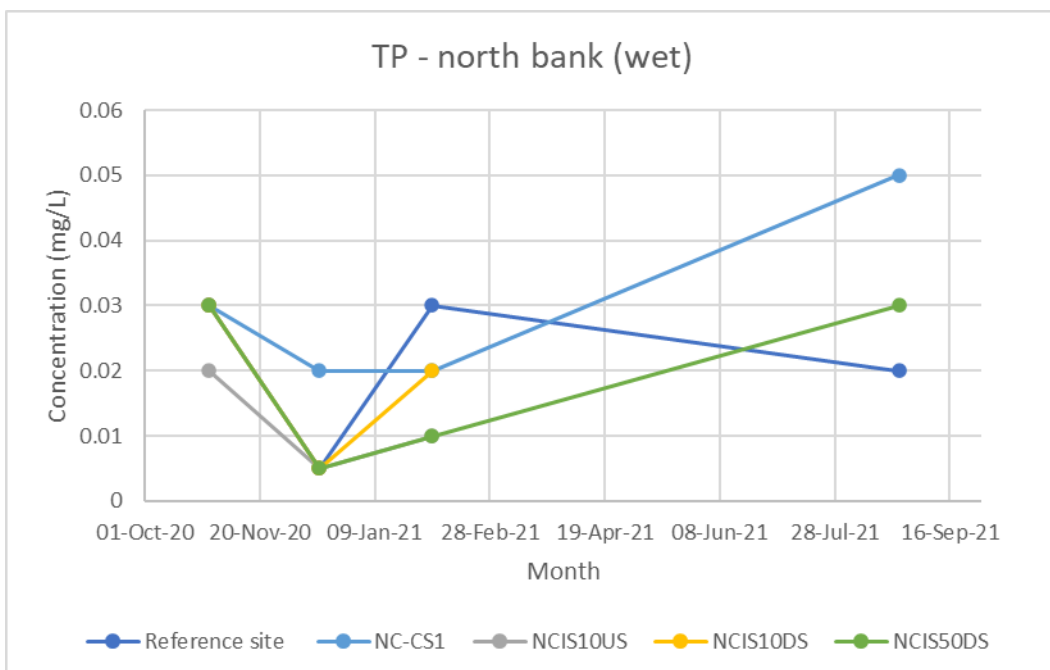


1.5 Total Phosphorous

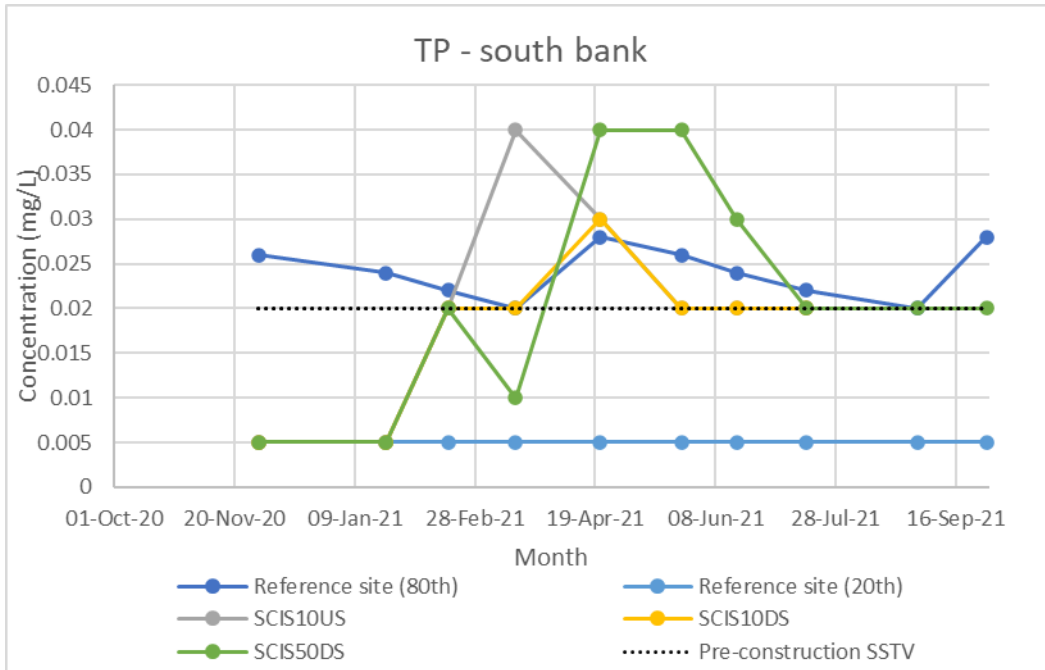
North Bank - Dry Weather



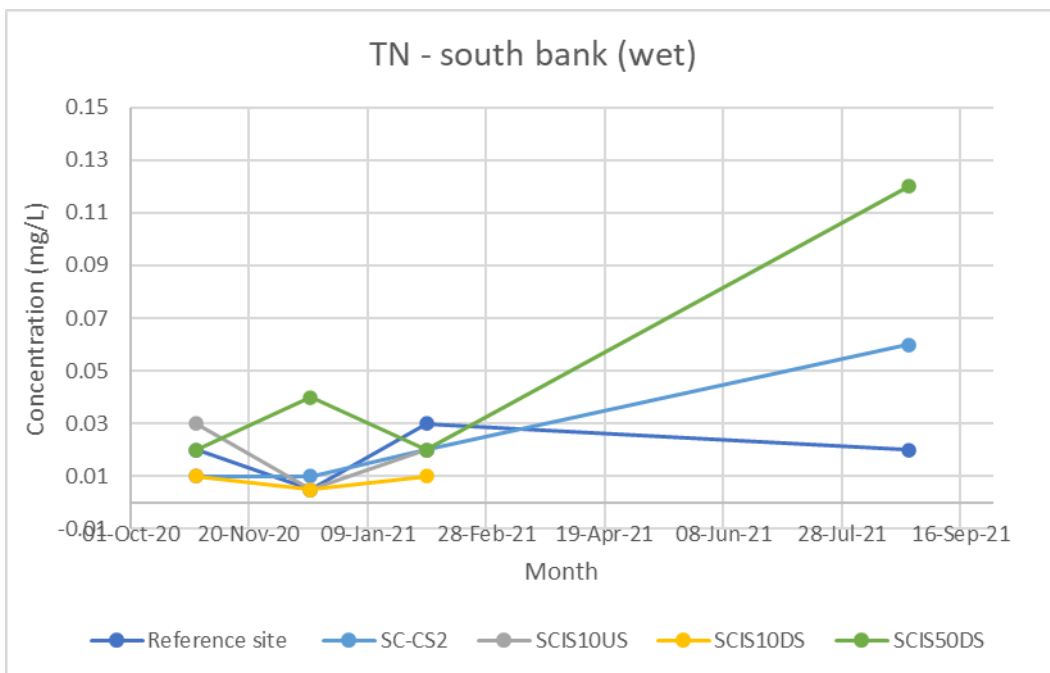
North Bank - Wet Weather



South Bank - Dry Weather

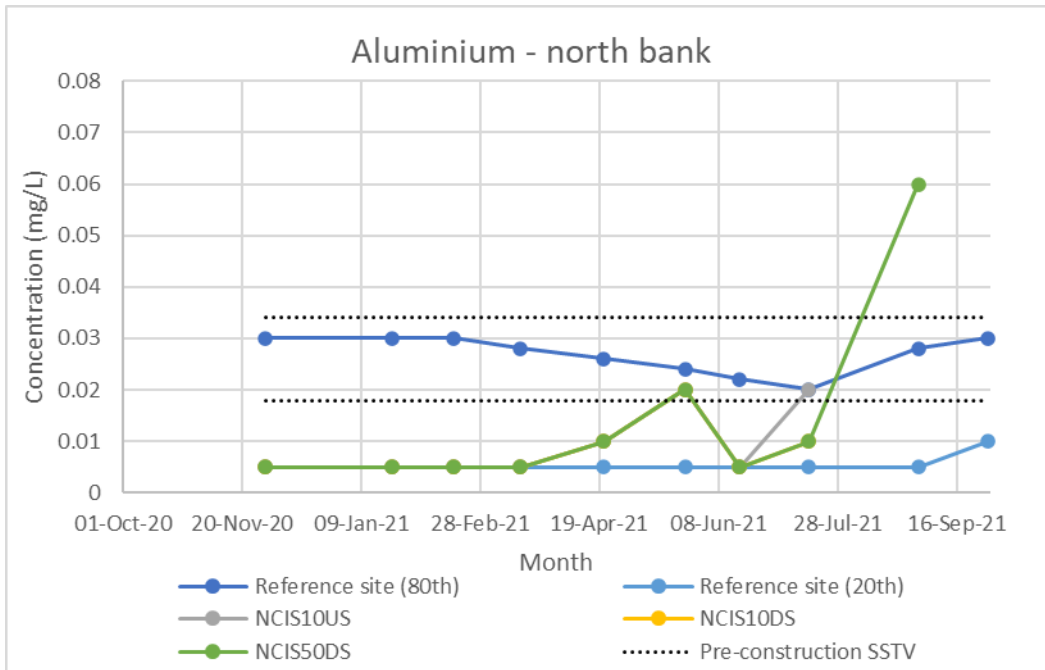


South Bank - Wet Weather

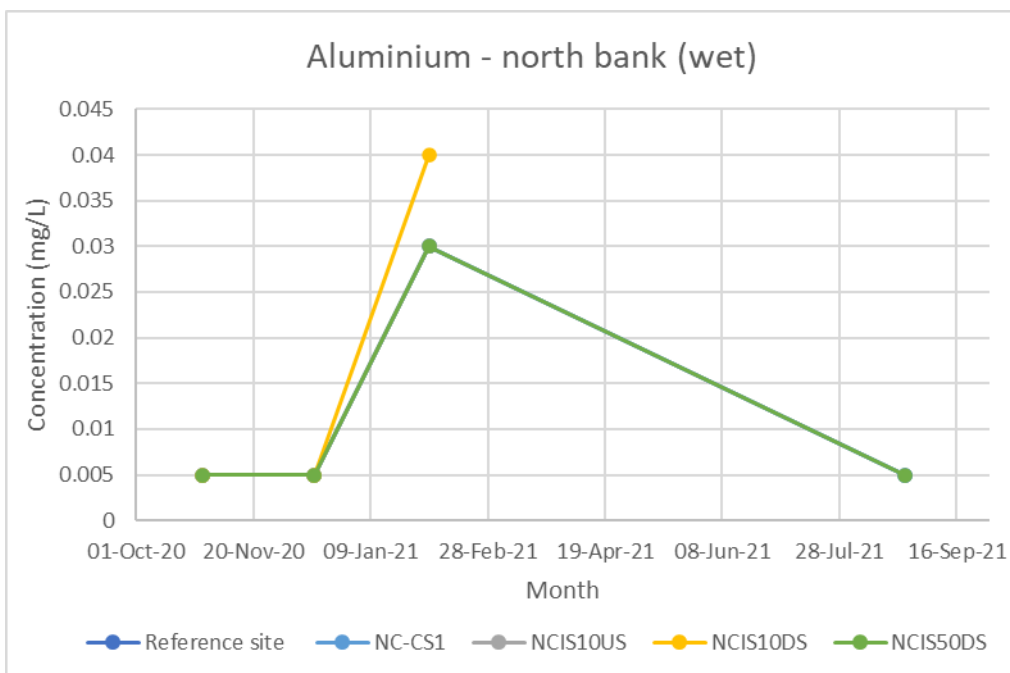


1.6 Dissolved Aluminium

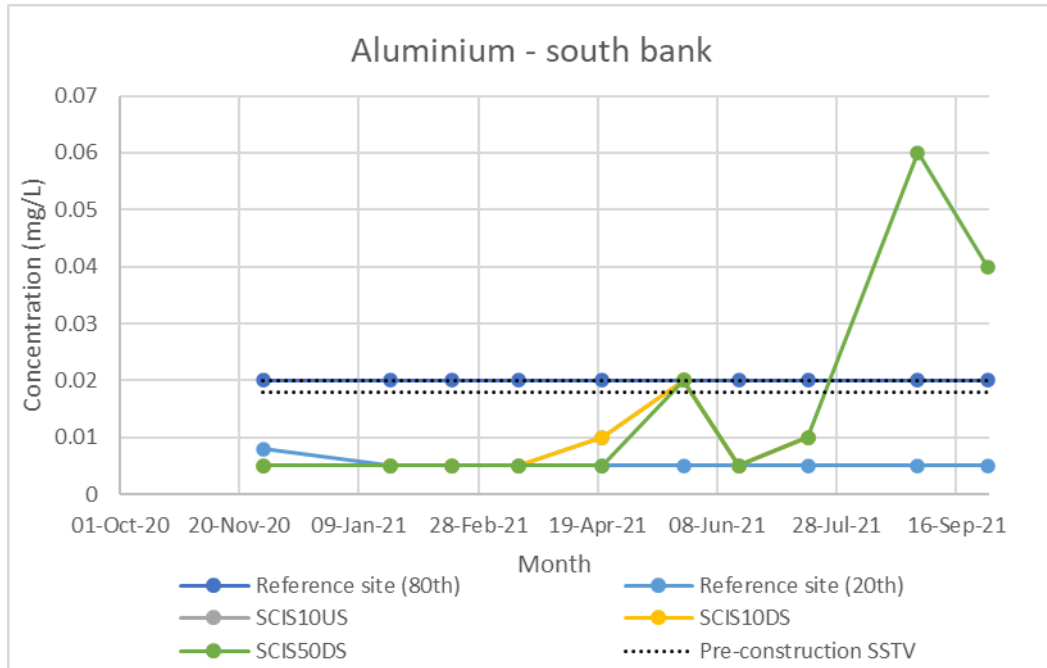
North Bank - Dry Weather



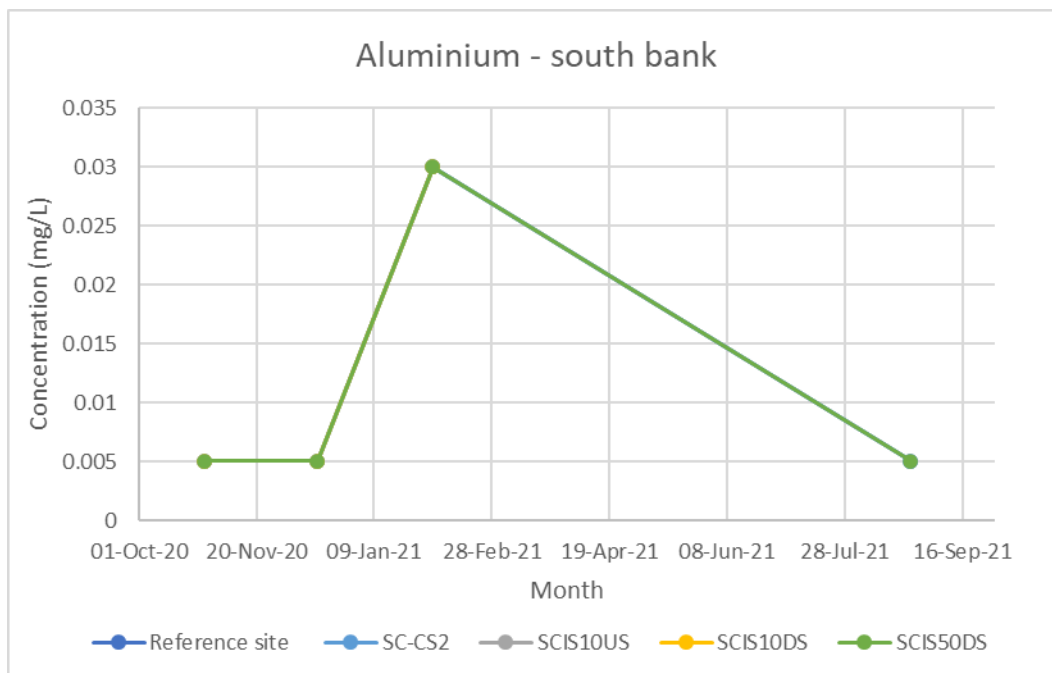
North Bank - Wet Weather



South Bank - Dry Weather

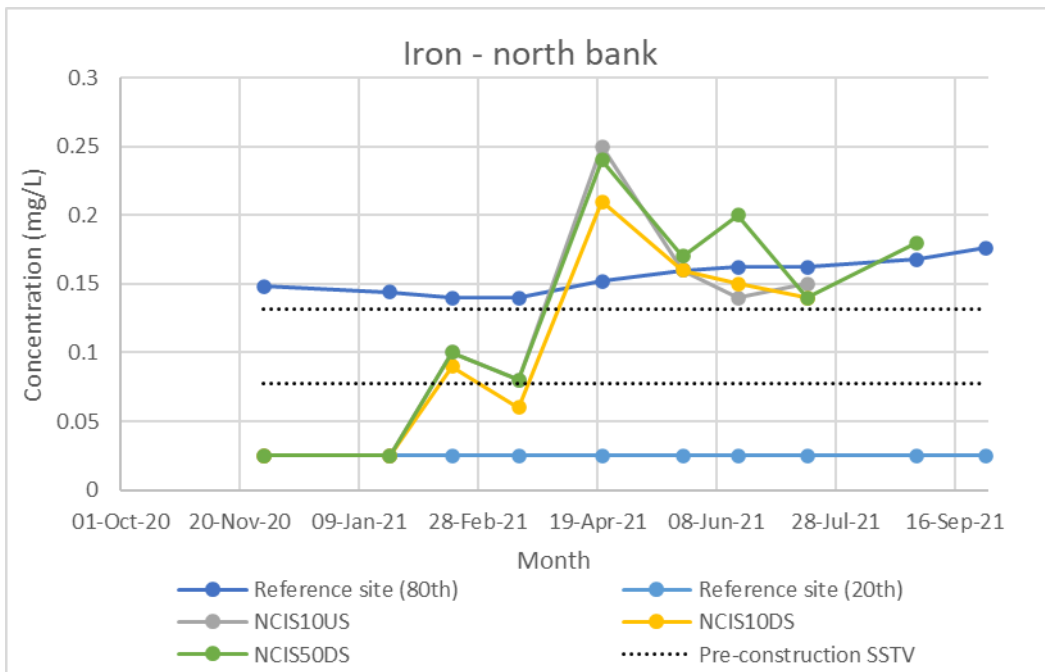


South Bank - Wet Weather

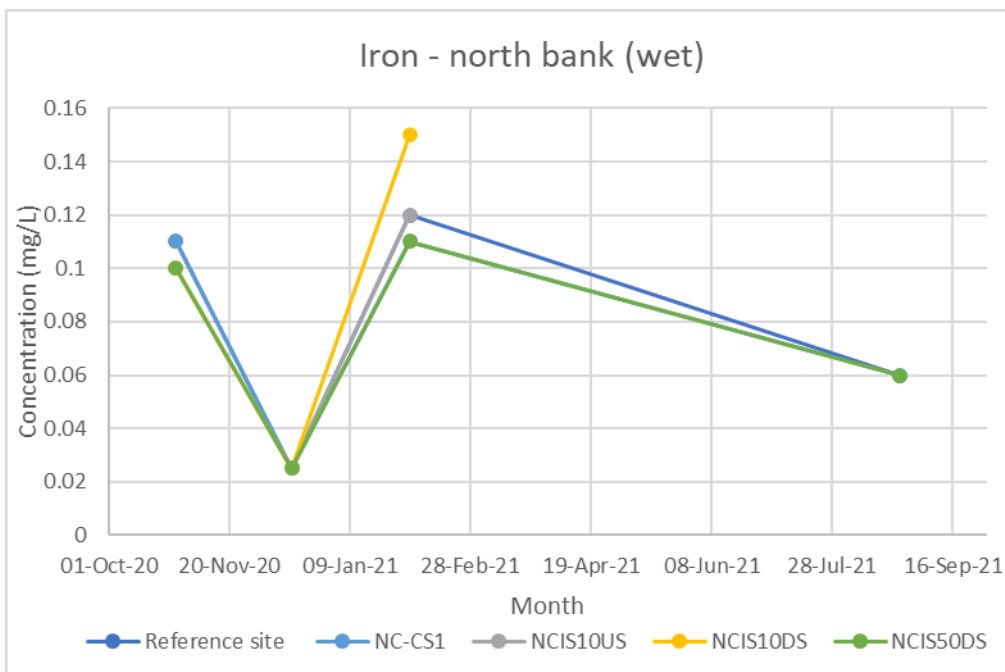


1.7 Dissolved Iron

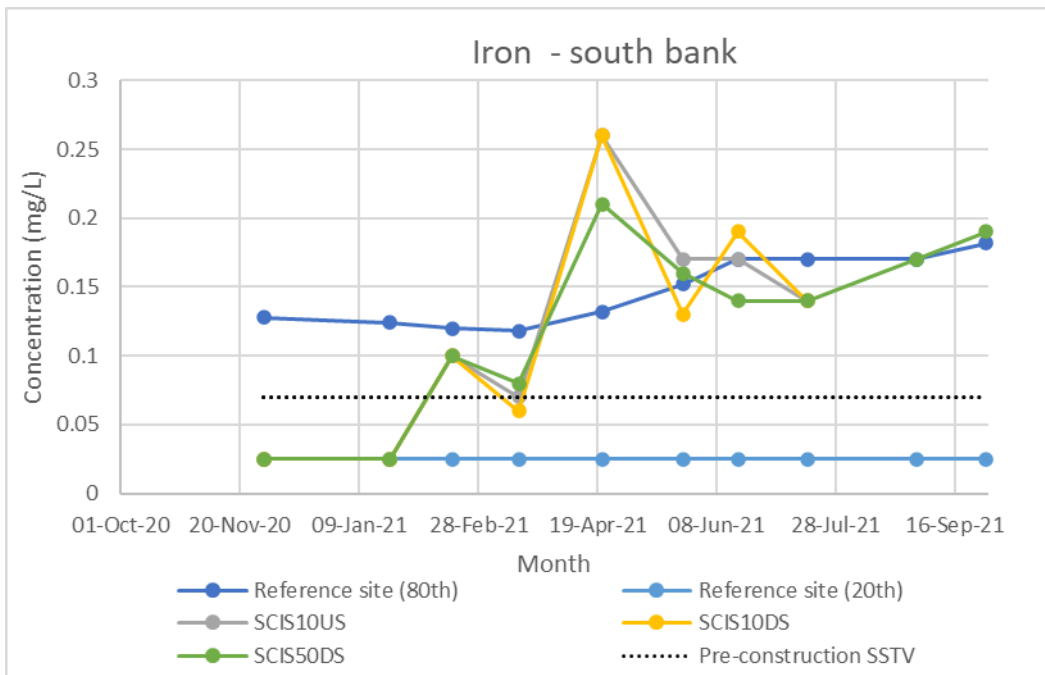
North Bank - Dry Weather



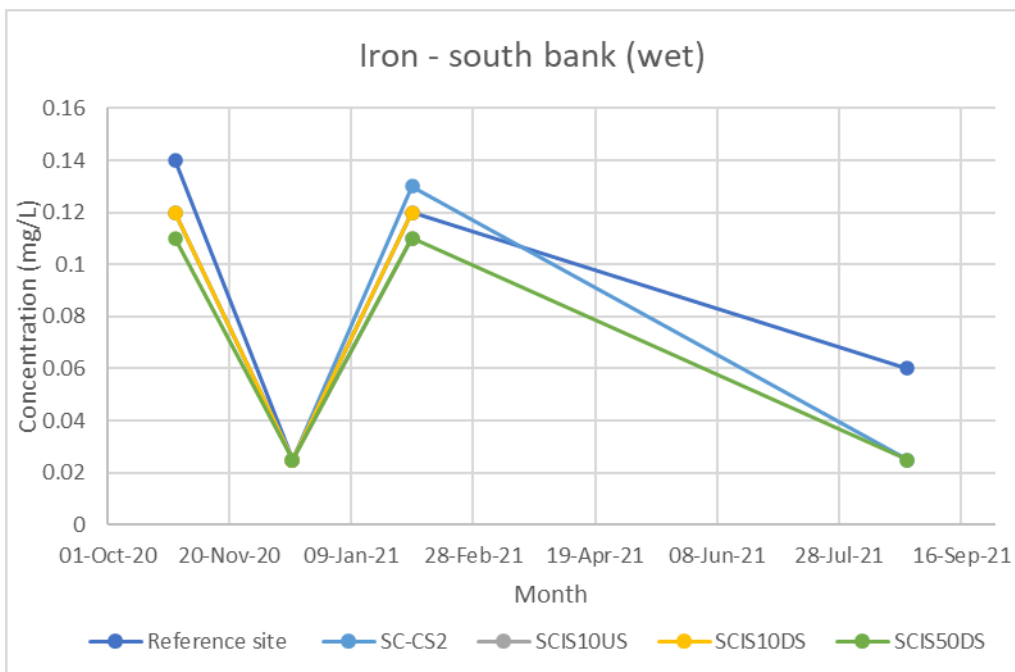
North Bank - Wet Weather



South Bank - Dry Weather

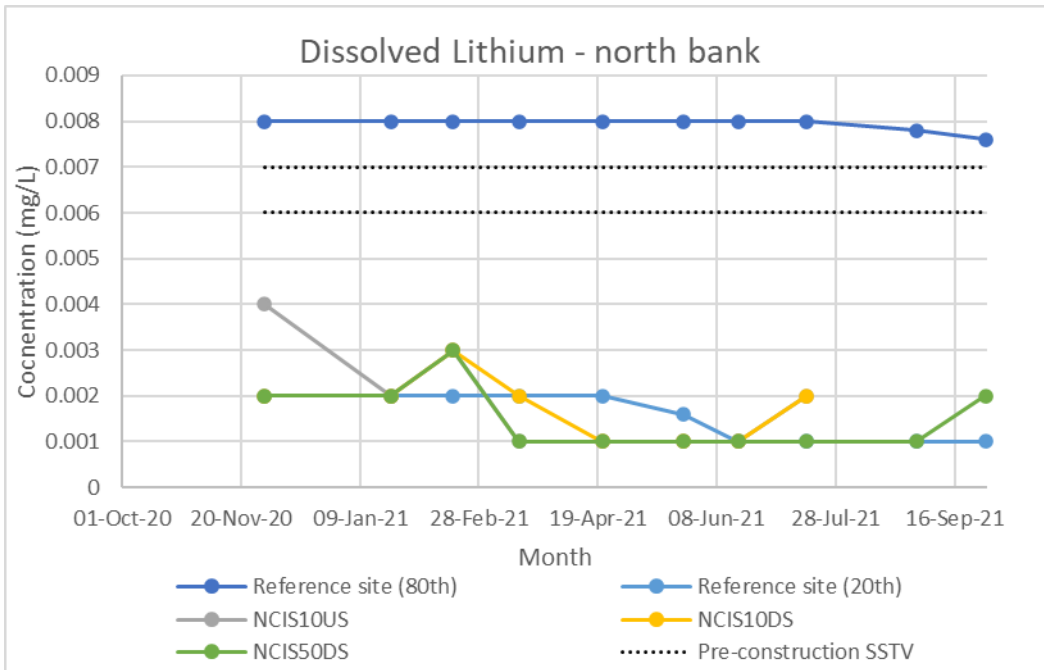


South Bank - Wet Weather

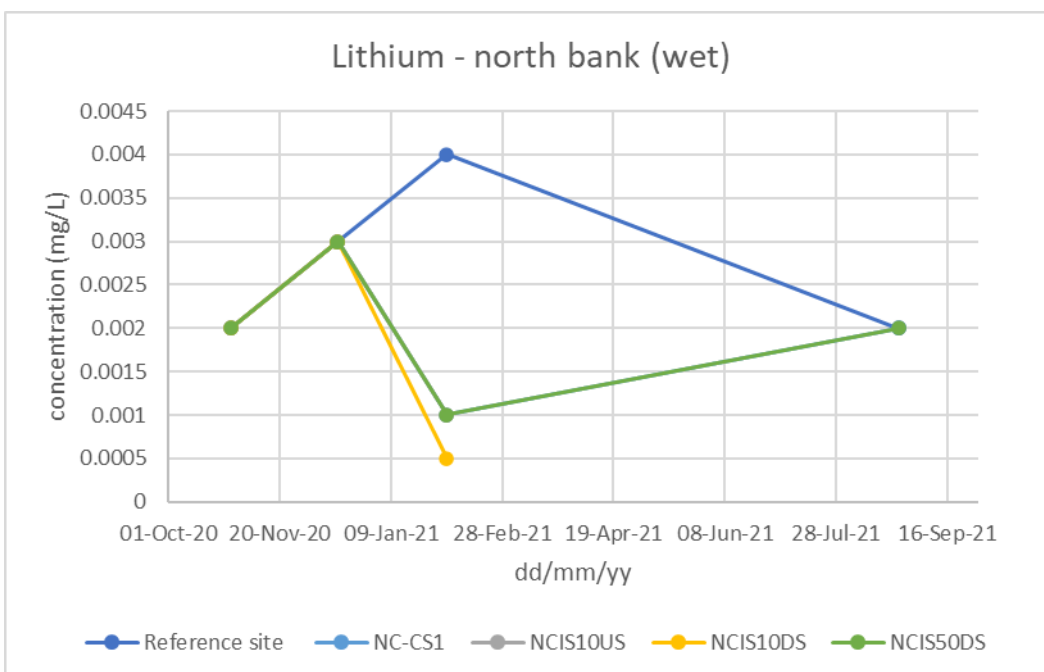


1.8 Dissolved Lithium

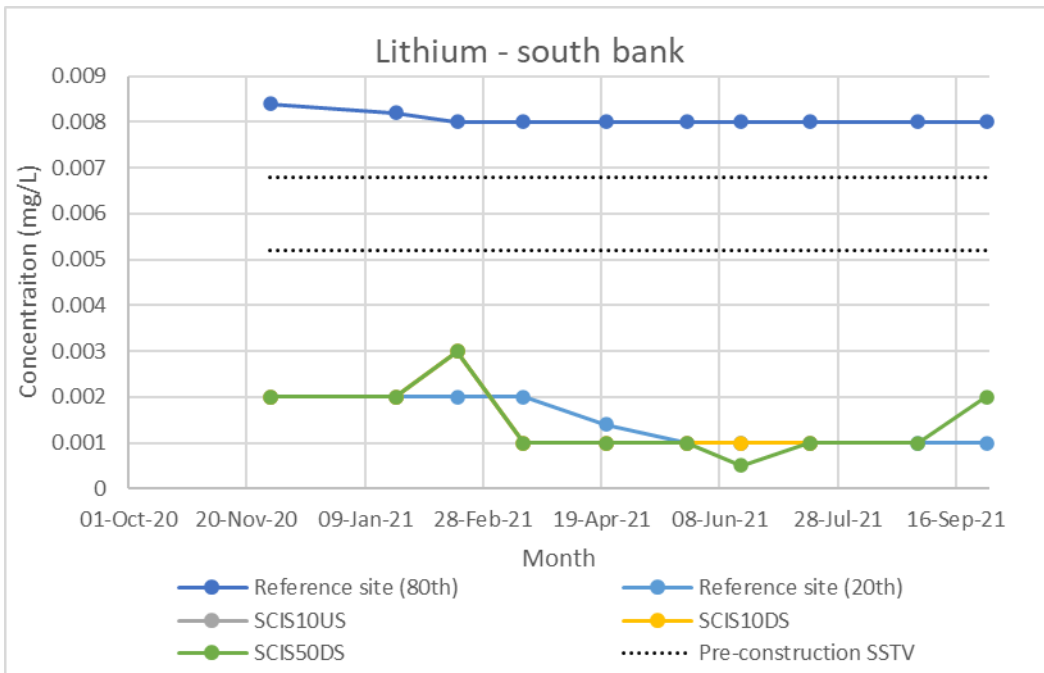
North Bank - Dry Weather



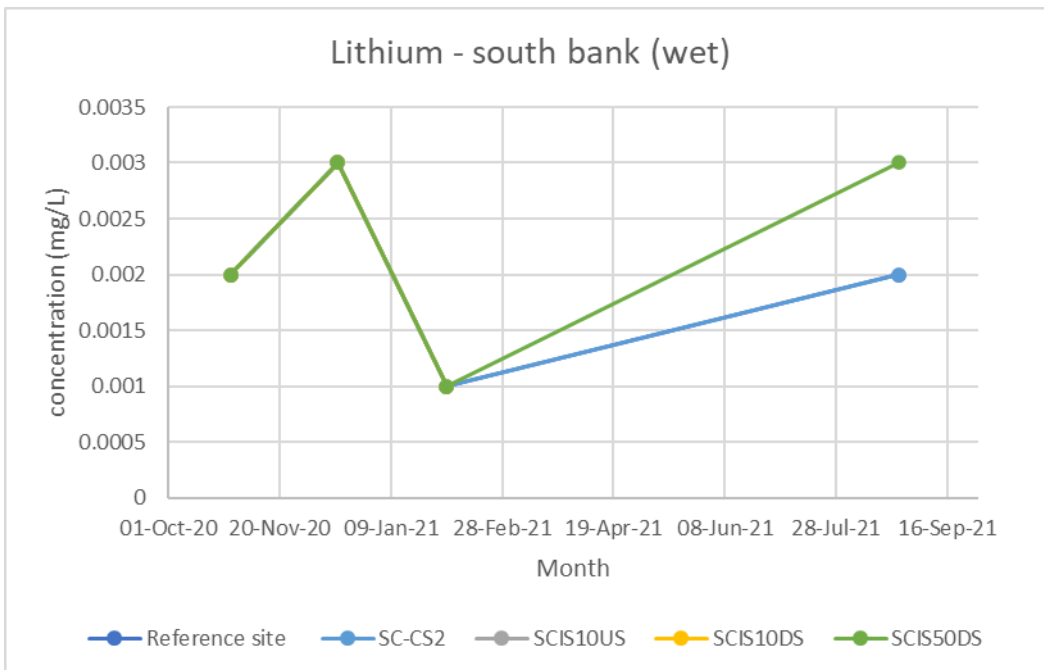
North Bank - Wet Weather



South Bank - Dry Weather



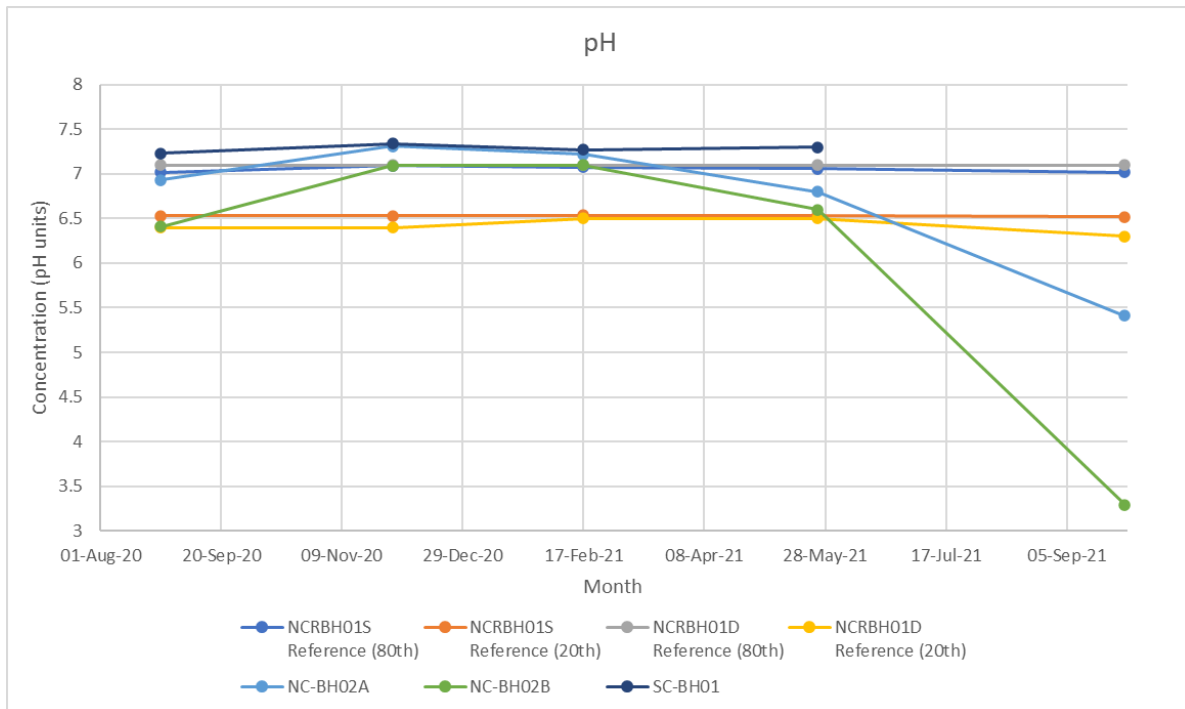
South Bank - Wet Weather



2. Groundwater Results

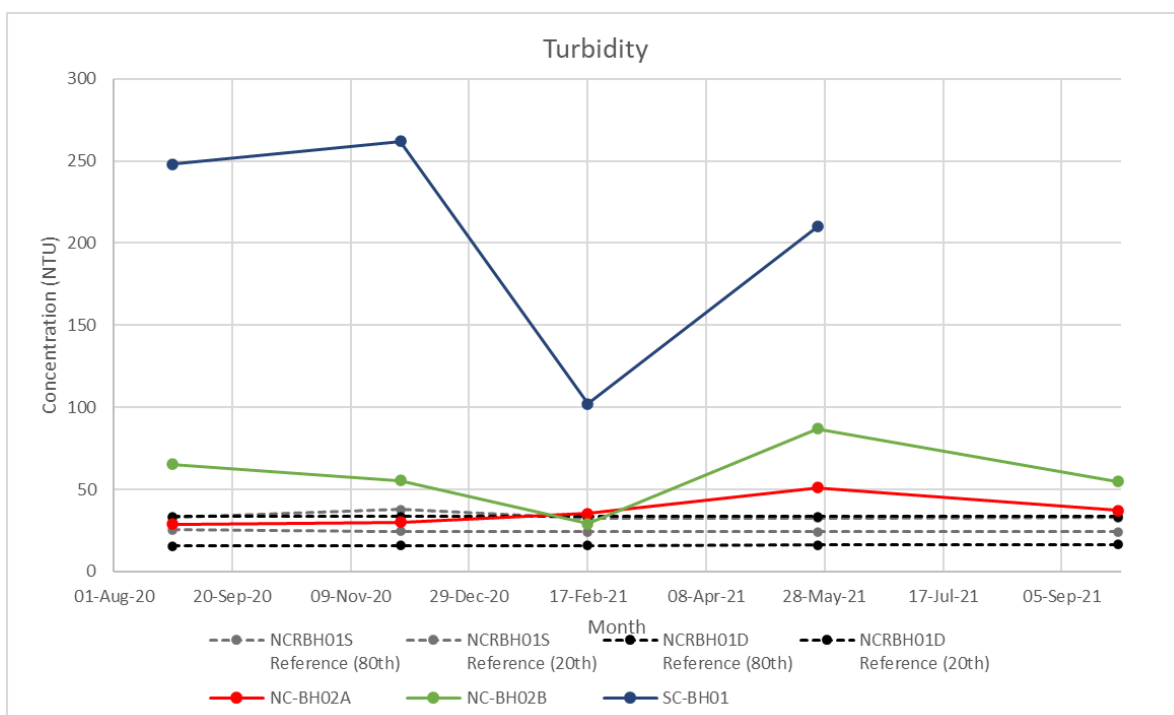
2.1 pH

All sites – dry weather



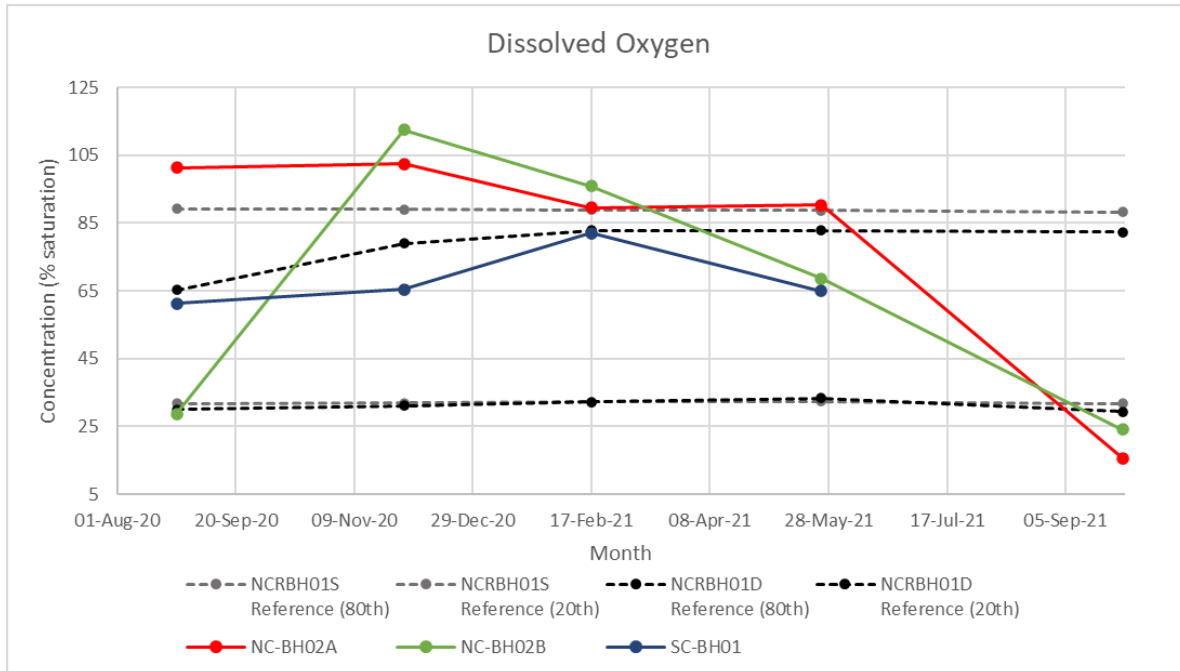
2.2 Turbidity

All sites – dry weather



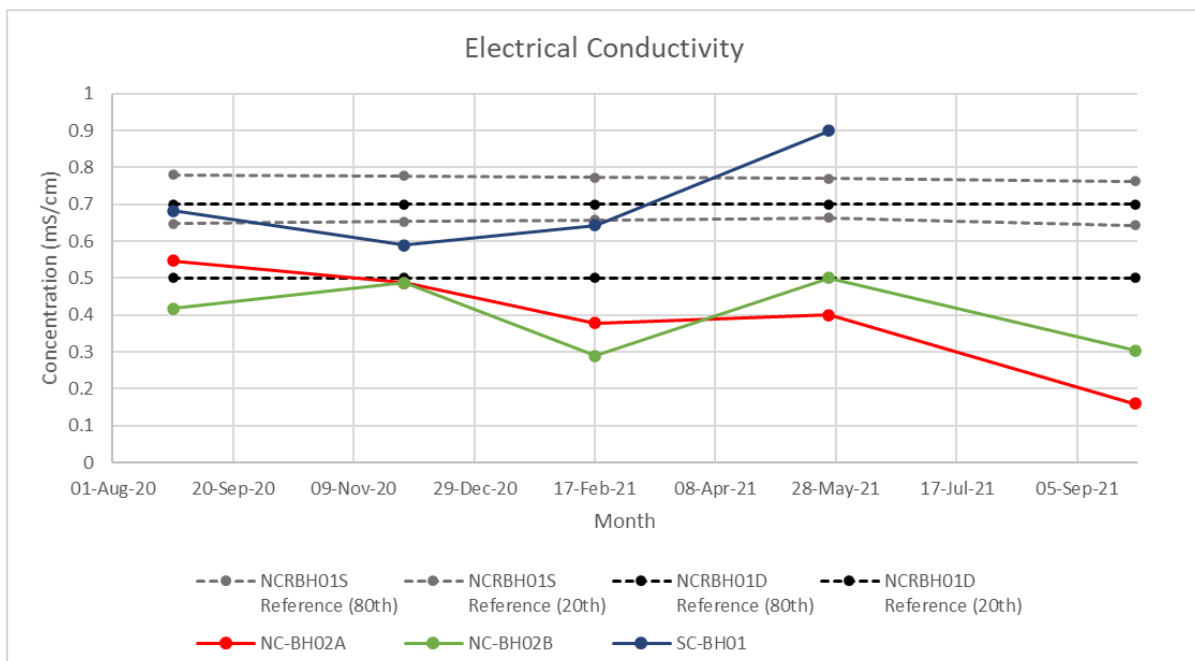
2.3 Dissolved Oxygen

All sites – dry weather



2.4 Electrical Conductivity

All sites – dry weather



2.5 Groundwater levels

