

# MEMO

Date: 24 August 2021  
To: Simon Poggioli (Project Engineer)  
From: Alan Foley  
Pages: 9 inc. this page excluding attachments  
Regarding: Surface Water Quality – Event #13 Summary

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## Fremantle Swan River Crossing – Surface Water Quality Monitoring Event #13

### Background

Laing O'Rourke on behalf of Fremantle Bridges Alliance (the Alliance), has commissioned RPS Australia West Pty Ltd (RPS) to provide environmental services to support the Swan River Crossing (SRC) project. The project includes the replacement of the Fremantle Traffic Bridge and the improvement/duplication of the Fremantle Rail Bridge. As detailed within the Preliminary Environmental Impact Assessment (Main Roads Western Australia, 2020), surface water quality has the potential to be impacted during new bridge construction and demolition of the old structure. As such, a baseline assessment of the surface water quality is being completed to inform a future Construction Environment Management Plan (CEMP) monitoring program.

RPS has previously undertaken eight monitoring events while contracted to Arup/MRWA. This memo provides details on the surface water monitoring Event #13, completed 5 August 2021, and is a continuation of the program undertaken by RPS for MRWA between August 2020 and March 2021. Event #12 was the final proposed monthly event being undertaken as part of the initial baseline assessment for the CEMP. Event #13 (this event) was completed to capture winter river-flow conditions following heavier rainfall experienced during July 2021.

### Sampling locations

The program includes collection of surface water samples from five locations. Further details on sampling locations are presented in Figure A and Table 1.

*For previous sampling events, Event #1 (August 2020) and Event #2 (September 2020), the program was reduced to four locations with background location WS-5 excluded due to the project awaiting Department Biodiversity, Conservation and Attractions (DBCA) access approval. Approval was received for sampling within the Swan River DBCA control area on 5 October 2020. As such, all sampling locations have been included from Event #3 onwards.*

A copy of the DBCA approval, 2020-1928 Permit P12652, has been included in Appendix A.

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**Table 1: Surface water sampling locations summary**

Sampling point	Swan River Bathymetry <sup>1,2</sup> (m)	Commentary
WS1	~4.0-6.0 <sup>1</sup>	<ul style="list-style-type: none"><li>Central channel (northern side)</li><li>Sample collected from Fremantle Traffic Bridge northern access point</li></ul>
WS2	~4.0-6.0 <sup>1</sup>	<ul style="list-style-type: none"><li>Central channel (southern side)</li><li>Sample collected from Fremantle Traffic Bridge southern access point</li></ul>
WS3	~2.0-4.0 <sup>1</sup>	<ul style="list-style-type: none"><li>Northern shoreline</li></ul>
WS4	~4.0-5.0 <sup>1</sup>	<ul style="list-style-type: none"><li>Southern shoreline</li><li>Small craft pen jetty</li></ul>
WS5	~2.0-6.0 <sup>2</sup>	<ul style="list-style-type: none"><li>Southern shoreline</li><li>Public jetty</li><li>Background location</li></ul>

Notes: 1. Results of a geophysical survey of the portions of the site was undertaken in 2012 (Marine & Earth Sciences, 2012), which was used inform the Arup reports (Arup, 2013a and 2013b)

2. Swan and Canning Rivers navigation chart 1:25,000. April 2014, Edition 7. Department of Transport  
[https://www.transport.wa.gov.au/imarine/coastaldata/nauticalcharts/pdfs/WA898\\_swан\\_and\\_canning\\_rivers.pdf](https://www.transport.wa.gov.au/imarine/coastaldata/nauticalcharts/pdfs/WA898_swан_and_canning_rivers.pdf).

## Sampling program schedule overview

The proposed surface water quality sampling program schedule is presented in Table 2.

**Table 2: Sampling program**

Event	Sampling locations	Event Date	Date Completed	Status
Event 1	WS2, WS4	August 2020	7/08/2020	Completed
Event 2	WS1-WS4	September 2020	10/09/2020	Completed
Event 3	WS1-WS5	October 2020	7/10/2020	Completed
Event 4	WS1-WS5	November 2020	5/11/2020	Completed
Event 5	WS1-WS5	December 2020	3/12/2020	Completed
Event 6	WS1-WS5	January 2021	13/01/2021	Completed
Event 7	WS1-WS5	February 2021	11/02/2021	Completed
Event 8	WS1-WS5	March 2021	04/03/2021	Completed
Event 9	WS1-WS5	April 2021	20/04/2021	Completed
Event 10	WS1-WS5	May 2021	05/05/2021	Completed
Event 11	WS1-WS5	June 2021	03/06/2021	Completed
Event 12	WS1-WS5	July 2021	15/07/2021	Completed
Event 13	WS1-WS5	August 2021	05/08/2021	Completed – this round
Event 14	WS1-WS5	-	-	TBC

Notes: To be completed (TBC). Event 9 (April 2021) was the first monitoring event completed as part of the current contract.

## Surface water sampling methodology

Surface water sampling was conducted in accordance with the following relevant guidance:

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- Department of Water and Environmental Regulation, *Assessment and Management of Contaminated Sites – Contaminated Sites Guidelines* (DER, 2014)
- National Environment Protection (Assessment of Site Contamination) Measure 1999, *Schedule B – General Guidelines for the Assessment of Site Contamination* (NEPC, 2013)
- *Water Quality—Sampling. Part 1: Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples* (Standards Australia, 1998. AS/NZS 5667.1:1998)
- *Water Quality—Sampling. Part 6: Guidance on sampling of rivers and streams* (Standards Australia, 1998. AS/NZS 5667.6:1998)
- *Water Quality—Sampling. Part 9: Guidance on sampling from marine waters* (Standards Australia, 1998. AS/NZS 5667.9:1998)
- Heads of EPAs Australia and New Zealand (HEPA), *PFAS National Environmental Management Plan, Version 2.0* (HEPA, 2020).

Each Swan River surface water sample was collected using a Niskin Flask or surface water sampling pole depending upon water column depth as detailed below:

- Where the water column was >2 m, the following two depths were targeted:
  - Sample 1 (shallow sample): collected at ~1 m below surface level
  - Sample 2 (deep sample): collected ~1 m above riverbed level.
- Where the water column was <2 m (WS3), the sample was collected in the middle of the water column, using a surface water pole sampler.

Field observations were collected during each sampling event and included commentary on weather conditions, tides and vessel movement within the Fremantle port and surrounding waters.

## Analysis program

All samples were analysed for the following analytical suite:

- Dissolved metals and metalloids: aluminium, arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silicon, silver, and zinc.
- Total metals: aluminium and iron.
- Major anions: sulfate ( $\text{SO}_4^{2-}$ ), chloride ( $\text{Cl}^-$ ), fluoride ( $\text{F}^-$ ), alkalinity (hydroxide  $\text{OH}^-$ , carbonate  $\text{CO}_3^{2-}$ , bicarbonate  $\text{HCO}_3^-$ ).
- Major cations: sodium, potassium, calcium, magnesium.
- Nutrients: total and reactive phosphorus, total nitrogen, total Kjeldahl nitrogen (TKN), total ammonia ( $\text{NH}_4\text{-N} + \text{NH}_3\text{-N}$ ), nitrates and nitrites ( $\text{NO}_x\text{-N}$ ).
- Sulfide ( $\text{S}^{2-}$ )
- Total acidity

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- Total dissolved solids (TDS) and Total suspended solids (TSS)
- Turbidity
- Hydrocarbons: Total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylene (BTEX) and polycyclic aromatic hydrocarbons (PAH)
- Organochlorine Pesticides (OCP)
- Per- and poly-fluoroalkyl substances (PFAS)
- Dissolved organic carbon (DOC)
- Chlorophyll-A and Phaeophytin-A.

Water column profiles for temperature, salinity (electrical conductivity (EC)), pH and dissolved oxygen (DO) were also collected at each sampling location.

## Surface water assessment levels

All analytes were compared against relevant Water Quality Australia 2019 guidelines, nominally (95% species protection) as follows:

- Water Quality Australia (WQA, 2019)
  - Marine Water Guidelines (MWG) 95% species protection level
    - Estuary water (for nutrients and pH only).
  - Recreational Water Guidelines (RWG)
- PFAS National Environmental Management Plan (HEPA, 2020).
  - Marine Guidelines 99% species protection level<sup>1</sup>
  - Recreational Water
- Treatment and management of soil and water in acid sulfate soil landscapes (DER, June 2015b).
  - Guideline levels for ASS surface water quality (ASS)

## Site conditions

Site conditions noted during the monitoring Event #13 are summarised within Table 3.

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<sup>1</sup> The 99% species protection value is considered to most appropriate as PFAS is known bioaccumulate in aquatic organisms.

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**Table 3: Site conditions**

Items	Commentary
<b>Weather conditions (during sampling event)</b>	Fine, south-south-westerly winds in the morning (9 km/hr), turning east-north-easterly in the afternoon (9 km/hr), maximum temperature of 19.6°C.
<b>Rainfall (noted during the previous week)</b>	A total of 31.2 mm of rain was recorded at the Perth Station (Number: 9225) in the week prior to sampling.
<b>Tide condition and direction</b>	<ul style="list-style-type: none"><li>• Outgoing tide.</li><li>• Closest peak:<ul style="list-style-type: none"><li>– High tide (7:09 am / 1.16 m)</li><li>– Low tide (5:09 pm / 0.60 m)</li></ul></li></ul>
<b>Fremantle Port and Swan River vessel activities</b>	<ul style="list-style-type: none"><li>• Water was brown and turbid during sampling event.</li><li>• WS1: High boat traffic and strong outgoing current.</li><li>• WS2: High boat traffic and strong outgoing current. Boat and diver were inspecting bridge pylons adjacent to location during sampling.</li><li>• WS3: Strong outgoing current, low water level.</li><li>• WS4: High boat traffic, strong outgoing current, two pilot boats on jetty.</li><li>• WS5: Low boat traffic, strong outgoing current.</li></ul>

## Monitoring results discussion

Results have been tabulated and are presented in Tables A to E, with laboratory reporting presented in Appendix B. Further commentary on specific analytes is provided below.

### Field parameters

Field parameters were measured throughout the water column prior to sampling at each location. The water column profiles are presented in surface water sampling logs at the rear of the report (Appendix C), with field parameters of sampling depths summarised in Table 4.

**Table 4: Sampling location field parameters**

Sample Location	Depth (m)	Temp (°C)	pH	EC (µS/cm)	Redox (mV)	DO (%sat)
WS1-S	1.00	14.3	7.27	13,504	186	92
WS1-D	2.50	14.4	7.28	13,596	185	90
WS2-S	1.00	13.6	7.41	10,427	105	94
WS2-D	4.00	14.0	7.41	18,483	126	88
WS3-S	0.15	15.3	7.66	11,889	180	66
WS4-S	1.00	15.9	7.66	53,948	95	90
WS4-D	3.50	16.4	7.74	55,985	98	87
WS5-S	1.00	13.8	7.34	8,308	147	123
WS5-D	6.50	16.4	7.67	54,297	178	148

During previous sampling events (#1 - #12) physical parameters for each sampling location did not typically change significantly with depth. However, physical parameters were noted to vary significantly with depth at each location during Event #13, with lower salinity water (lower EC) evident at the upstream locations WS1

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to WS3, and existing as a lens above the deep water at WS5. It was noted that the water at all locations were alkaline, brackish to saline and in an oxidising state. These conditions are consistent with the freshwater flows down the river on an outgoing tide, with water within the port (WS-4) remaining representative of marine water quality. RPS did note the following minor trends and guideline exceedances:

- Trends:
  - pH increased with depth at all locations except WS2.
  - Redox increased with depth at all locations except WS1, which marginally decreased.
  - Dissolved oxygen decreased with depth at all locations except WS5, which increased.
- Guideline exceedances:
  - DO percentage saturation (%sat) complied with the MWG (90-110%sat) in WS1-S and WS2-S. Results ranged from 66%sat (WS3-S) to 148%sat (WS4-D). Overall, results are consistent with historical ranges.

Additionally, RPS noted the following when comparing Event #13 results to historical ranges:

- The pH at all locations were significantly lower than previous events.
- EC at all locations except WS4 and WS5-D were significantly lower than previous events.

## Acid sulfate soil parameters

Acid sulfate soil (ASS) parameters observed during Event #13 are summarised as follows:

- Total acidity was significantly below the relevant guideline in all samples. Total acidity concentrations were consistent with previous sampling events.
- Sulfide concentrations were at or below the limit of reporting (LOR) at all locations and therefore below the relevant guideline. The sulfide concentrations during this event were comparable with previous events.
- Sulfate concentrations exceeded the recreational water guideline (500 mg/L) in all locations except for WS2-S, WS3-S and WS5-S, with concentrations ranging from 350 mg/L (WS2-S) and 2,800 mg/L (WS4-D). The results of all locations except for WS4-D were significantly lower than previous sampling events.
- Total alkalinity results ranged from 86 mg/L (WS5-S) to 120 mg/L (WS4-D). Results at all locations except for WS5-D were lower than historical ranges.

## Solids

- TDS concentrations varied across the sampling locations with concentrations ranging from 5,600 mg/L (WS5-S) to 35,000 mg/L (WS4-D). Results were significantly lower than previous events with the exception of WS4-D.
- TSS concentrations ranged from 11 mg/L (WS5-S) to 49 mg/L (WS1-S) across the site. Results were generally higher than the previous event (Event #12) however with several locations (WS1-S, WS4-S, WS4-D and WS5-D) recording their highest concentrations to date. All other locations were within their historical ranges.

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- Turbidity results ranged from 1.4 (WS4-D) to 9.5 (WS2-S) NTU<sup>2</sup>. Turbidity was overall significantly higher than previous events, with the highest results from the program observed during this event.

## Nutrients

Nutrient analytical results observed during Event #13 are summarised as follows:

- Reactive phosphorus (RP) concentrations exceeded the MWG (0.005 mg/L) at all locations ranging from 0.008 mg/L (WS4-D) to 0.043 mg/L (WS2-S). RP concentrations were overall higher than the previous event (Event #12) and generally higher than the historical range at all locations.
- Total phosphorous (TP) concentrations exceeded the MWG (0.03 mg/L), at all locations except WS4-D (0.02 mg/L). Concentrations ranged from 0.02 mg/L (WS4-D) to 0.13 mg/L (WS5-S). Total phosphorous concentrations were higher than the previous sampling events, with the majority of locations observing the highest concentrations to date.
- Total nitrogen (TN) concentrations exceeded the MWG (0.75 mg/L), at all locations except WS4-D (0.3 mg/L). Concentrations ranged from 0.03 mg/L (WS4-D) to 1.7 mg/L (WS5-S). TN concentrations were higher than the previous sampling events (except WS4-D), with all locations, except WS4-D, observing the highest concentrations to date.
- The concentration of NO<sub>x</sub> as nitrogen exceeded the MWG (0.045 mg/L) at all locations, except WS4-D (0.044 mg/L). Concentrations ranged from 0.044 mg/L (WS4-D) to 0.67 mg/L (WS5-S). Results were significantly higher than previous sampling events, except WS4-D, and were greater than historical ranges.
- All ammonia-N concentrations were below the MWG (0.62 mg/L), with concentrations, except at WS4-D, the highest observed during the sampling program. Total kjeldahl nitrogen concentrations were higher than previous sampling events, except at WS4-D.

## Chlorophyll

All Chlorophyll "A" concentrations were below the MWG (0.003 mg/L), except for WS3-S (0.0061 mg/L), which is the first time the MWG has been exceeded at any location during the sampling program. Concentrations ranged of 0.0003 mg/L (WS2-D) to 0.0061 mg/L (WS3-S) observed. Results, except for WS3-S, from this event were relatively consistent with previous events.

Low concentrations of Phaeophytin "A" were detected within all samples, with concentrations ranging from 0.0008 mg/L (WS4-D) to 0.0046 mg/L (WS3-S). The Phaeophytin "A" concentration at WS3-S was significantly higher than historical concentrations, all other results were relatively consistent with previous events.

## Metals and metalloids

Metal analytical results observed during Event #13 are summarised as follows:

- Dissolved metals:
  - The concentration of copper exceeded the MWG (0.0013 mg/L) at all locations except WS4-S, WS4-D and WS5-D, with concentrations ranging from <0.001 mg/L (WS4-S, WS4-D and WS5-D) to 0.003 mg/L (WS3-S). These results are within the historical range.

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<sup>2</sup> NTU: Nephelometric Turbidity unit, i.e., the unit used to measure the turbidity of a fluid or the presence of suspended particles in water.

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- The concentrations of all other dissolved metals were below the adopted criteria for all samples. Whilst remaining below the adopted criteria, several metals and metalloids (iron, manganese and silicon) observed the highest concentrations to date across all locations during the monitoring program. Iron was significantly (~10x) greater than previous sampling events.
- Total metals:
  - Total aluminium concentrations were above the LOR (0.02 mg/L) at all locations during this sampling event. Results are higher than with previous sampling events.
  - Total iron concentrations ranged from 0.05 mg/L (WS4-D) to 0.83 mg/L (WS1-S). All concentrations were below the MWG (1 mg/L). These results are higher than the previous sampling event and on the whole significantly (~10x) above historical ranges.

## Hydrocarbons

All hydrocarbon results (BTEX, TRH and PAH) were below their relevant LOR.

## Pesticides

All organochlorine pesticides results were below their relevant LOR.

## PFAS

PFAS analytical results observed during Event #13 are summarised as follows:

- Perfluorooctanesulfonate (PFOS) exceeded the 99% species protection MWG (0.00023 µg/L) in all samples, ranging from 0.0008 µg/L (WS4-D) to 0.038 µg/L (WS3-S), with a mean of 0.0082 µg/L across all locations. At most locations these concentrations were above the historical ranges at each location, with the result at WS-3 an order of magnitude higher. The mean concentration during this event was significantly higher than the mean for the previous event and overall historical mean (0.0042 µg/L and 0.0023 µg/L, respectively).
- Minor detections of Perfluorohexanesulfonic acid (PFHxS) and/or Perfluorooctanoic acid (PFOA) were observed at all sampling locations. However, all concentrations were significantly below relevant guidelines.
- Total PFAS was relatively consistent between all locations and ranged from 0.0002 µg/L (WS4-D) to 0.069 µg/L (WS3-S) with a mean of 0.018 µg/L. At most locations these concentrations were above the historical ranges at each location observed during the sampling program, the mean for this event was higher than the mean for the previous event (0.0099 µg/L) and historical mean (0.0058 µg/L).

## Quality control and quality assurance

To maintain a high level of Quality Control and Quality Assurance (QAQC) sampling and analysis was undertaken with reference to relevant guidelines (DER, 2014, NEPC, 2013 and HEPA, 2020) and *Australian Standard 4482.1:1997* (Standards Australia, 2005). Strict hygiene procedures were applied throughout to assure a high level of sample integrity and quality was maintained, including the decontamination of all sampling equipment between sampling locations to prevent possible cross-contamination.

In accordance with HEPA (2020) guidance, one field duplicate was collected per 10 primary samples for PFAS analysis. In addition, one field blank, trip blank and field rinsate was collected per day of sampling. The results are presented in Tables F to N and summarised as follows:

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- A total of 118 of the 120 (98%) analyte tests performed on the field duplicate sample had a Relative Percentage Difference (RPD) within 30% of the original samples indicating the sampling and analysis procedures applied by RPS and the laboratory were generally reproducible.
  - One of the two total duplicate RPD failures were considered insignificant as both the primary and duplicate results were less than 5 x LOR. In such instances the elevated RPD merely indicates that analytical precision decreases as concentrations approach the LOR.
  - The remaining RPD exceedance (Chlorophyll "a") was considered significant as the concentrations were greater than 5 x LOR. The failures are likely due to minor differences in water quality when sampling. The duplicate sample concentration was higher and as such was used for the data assessment. These exceedances were not considered to have affected the water quality assessment.
- The concentrations of turbidity were marginally above their respective LORs within the field rinsate sample (WR1) and the field blank (WB1) were above the laboratory LOR. Minor exceedances of acceptance criteria (>LOR) are potentially a reflection of the quality of deionised water used for the blank/rinsate collection.
- All trip blank samples were below their respective LORs.
- All internal laboratory QAQC procedures (method blanks, matrix spikes, laboratory control standards, internal duplicates) except for the following were within acceptable limits:
  - A number of PFAS compound internal standards were outside of general acceptance criteria but within analyte specific criteria. Laboratory LORs were increased to accommodate. All other criteria were within acceptable laboratory limits.
- All samples were analysed within the recommended holding time for each analyte with the exception of Chlorophyll "A" and Phaeophytin "A" which were noted to exceed holding time criteria, however, this was due to extract or analysis dates not being provided. As such, the holding times could not be calculated.

The conclusion of the QAQC assessment indicates that sampling and analysis was generally reproducible and complied with accepted standards. As such, the data collected is considered representative of the site and suitable for the data assessment undertaken.

## Conclusions

Surface water monitoring Event #13 was completed on 5 August 2021. Samples were collected from all five of the sampling locations (Figure A). A shallow and deep sample were collected at each sampling point utilising the defined Niskin flask methodology, with the exception of WS3. Due to the shallow nature of WS3 (water column depth approximately ~1.0 m) a shallow sample was collected utilising a surface water sampling pole from a central point in the water column (~0.5 m).

A review of the analytical data collected indicates that the site waters were alkaline, brackish to saline and in an oxidising state. Minor exceedances of assessment criteria were noted (DO), however, these conditions are consistent with freshwater flows down the river on an outgoing tide, with water within the port (WS-4) remaining representative of marine water quality.

Exceedances of the MWG for nutrients were observed at most locations, with concentrations on the whole, the highest observed to date. All Chlorophyll "A" concentrations were below the MWG except for WS3-S which is the first time the MWG has been exceeded at any location during the sampling program.

The concentration of copper marginally exceeded the MWG (0.0013 mg/L) at most locations with all other metal and metalloids concentrations were below relevant guidelines at all locations. Results were relatively

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consistent with previous events, with the exception of iron, manganese and silicon being higher than previous events. Iron was observed to be significantly (~10x) greater than previous sampling events.

All hydrocarbon and organochlorine pesticides results were below their relevant LOR and as such also below adopted criteria in all samples analysed.

Minor detections of PFAS (PFHxS, PFOS and PFOA), were detected within all samples. The 99% species protection PFOS MWG (0.00023 mg/L) was exceeded in all samples, however, was significantly below the 95% species protection MWG (0.13 mg/L). Concentrations of PFOS at most locations was above the historical ranges at each location, with the result at WS-3 an order of magnitude higher. No exceedances of any other relevant MWG or RWG were noted. Total PFAS concentrations were higher than historical means at most locations above historical ranges.

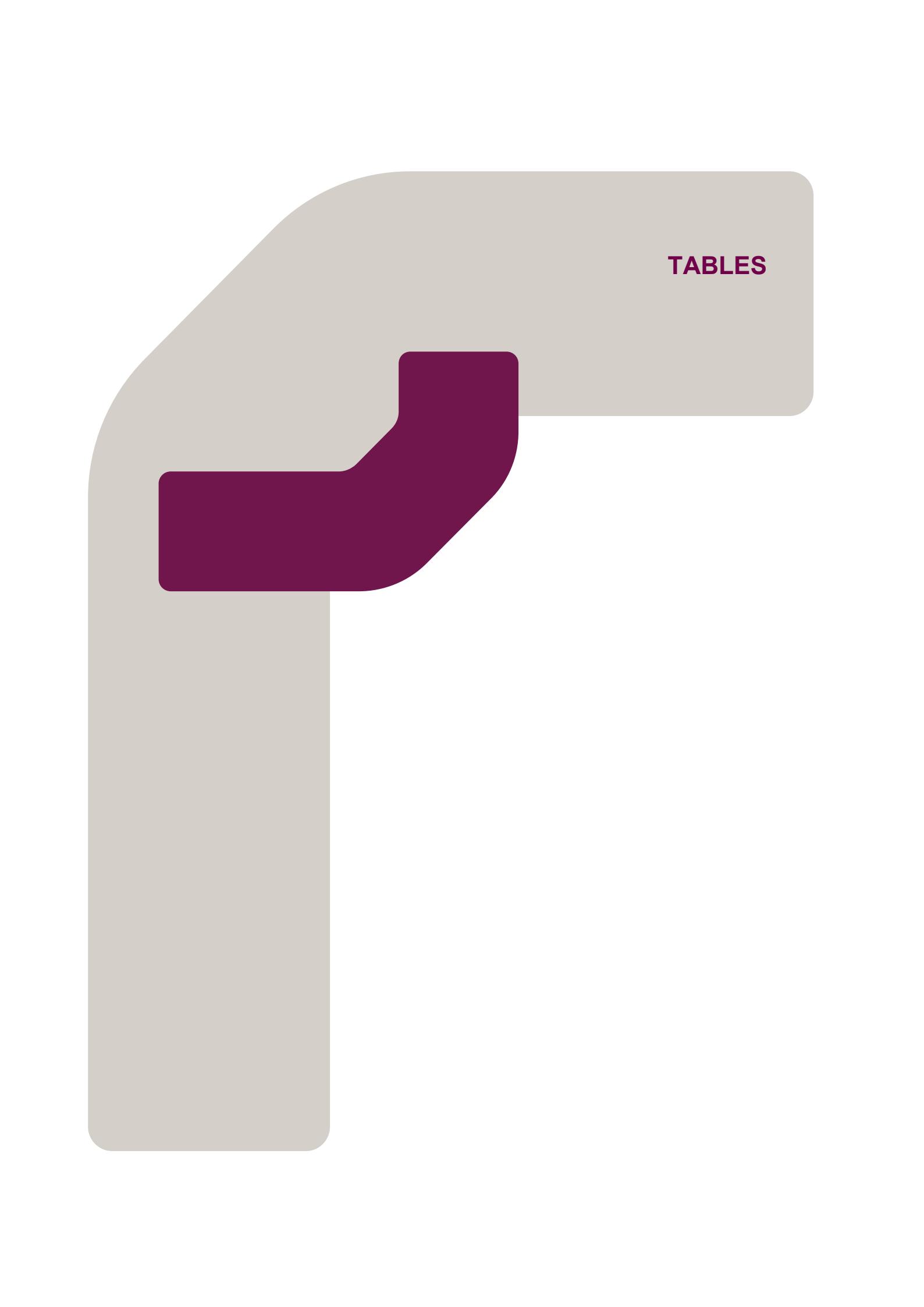
The results of this one-off sampling event (outgoing tide / winter flows) are suggestive that more elevated turbidity, nutrient, metals and PFAS concentrations can be expected to be encountered during winter river-flow conditions, where catchment runoff and additional sediment mobilisation would be predicted to occur.

We trust that this is to your satisfaction, should you have any queries please contact the undersigned.



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Enc.           Tables  
                Figure A - Water quality sampling locations  
                Appendix A – DBCA approval  
                Appendix B – Laboratory reports  
                Appendix C – Surface water sampling logs



## TABLES

**Table A**  
**Surface Water Results: Field Parameters, ASS, Cations, Nutrients and Miscellaneous**

**Definitions:**

MWG (Marine Water Estuary Guideline) for slightly - moderately disturbed systems, RWG (Recreational Water Guidelines), ASS (Acid Sulfate Soils) Standing Advice from DWER on dewatering trigger values taken from ASS Guideline Series (2015),

- (No Guideline), --- not tested, LOR (Limit of Reporting), <sup>#</sup> duplicate value

**Notes:**

Guideline values have been adopted from the following guidance documentation:

- Treatment and Management of Soil and Water in Acid Sulfate Soil Landscapes (DER 2015b)

- Assessment and Management of Contaminated Sites (DER 2014)

- Freshwater and Marine Water Quality Guidelines Chapter 3 (ANZECC/ARMCANZ 2000)

All results expressed as mg/L except for pH (pH units), ratios (unitless), Redox mV (mili Volts), turbidity (NTU) and EC ( $\mu$ S/cm)

a) Values for estuary environments - Table 3.3.6 ANZECC/ARMCANZ 2000 Freshwater and Marine WQ Guidelines Chapter 3

c) Values based on Australian Government, National Health and Medical Research Council, Guideline for Managing Risks in Recreational Water (NHMRC, 2008)

d) Recreational water guideline values based on drinking water guidelines NHMRC & ARMCANZ (2011) Australian Drinking Water Guidelines

e) TKN concentration calculated (TKN = TN-NOx-N)

Denotes less than LOR

Sample ID	Date	Trigger	Field Parameters				Acid Sulfate Soil Parameters and Anions								ASS Ratios		Cations				Nutrients				Miscellaneous						
			pH	E.C.	Redox	DO	Total Acidity (CaCO <sub>3</sub> )	Total Alkalinity (CaCO <sub>3</sub> )	TDS	TSS	Turbidity	Sulfide	Sulfate	Chloride	Fluoride	Acidity: Alkalinity	Sulfate: Chloride	Calcium	Magnesium	Potassium	Sodium	Total P	Reactive P	Total N	TKN <sup>e</sup>	NH <sub>3</sub> -N	NO <sub>x</sub> -N	Dissolved Organic Carbon (DOC)	Chlorophyll "A"	Phaeophytin "A"	
			Units	pH units	$\mu$ S/cm	mV	%sat	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	-	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		
			MWG	7.5-8.5	-	-	90-110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03 <sup>a</sup>	0.005 <sup>a</sup>	0.75 <sup>a</sup>	-	0.62 <sup>b</sup>	0.045 <sup>a</sup>	-	0.003 <sup>a</sup>	-	
			RWG	6.5-8.5 <sup>c</sup>	-	-	>80 <sup>c</sup>	-	-	-	-	-	-	500 <sup>d</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			ASS	<6	-	-	-	>40	-	-	-	-	-	>0.5	-	-	>1	>0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
			LOR	-	-	-	-	5	5	5	0.1	0.5	1	1	0.1	-	-	0.5	0.5	0.5	0.5	0.01	0.005	0.1	0.005	0.005	1	0.0001	0.0002		
WS1 - S	10/09/2020			8.18	50,919	80	104	9	120	36,000	<5	0.5	<0.5	2,400	18,000	---	0.08	0.13	390	1200	360	11000	0.03	0.006	0.2	0.2	0.009	<0.005	2	0.0012	0.0006
WS1 - S	7/10/2020			8.25	52,200	134	106	7	120	37,000	<5	0.4	0.6	2,300	17,000	<5	0.06	0.14	400	1300	380	10000	0.03	0.007	0.2	0.2	<0.005	<0.005	2	0.0009	0.0005
WS1 - S	5/11/2020			8.11	51,108	128	82	<5	120	37,000	<5	0.7	<0.5	2,800	20,000	<5	0.04	0.14	350	1200	310	10000	0.02	0.006	0.2	0.2	0.007	<0.005	3	0.0015	0.0006
WS1 - S	3/12/2020			8.08	49,503	178	86	--	120	37,000	<5	0.8	<0.5	2,700	19,000	<5	---	0.14	410	1300	390	12000	0.02	<0.005	0.6	0.6	<0.005	0.005	3	0.0014	0.0005
WS1 - S	13/01/2021			8.17	54,827	93	102	<5	130	37,000	<5	0.7	0.6	2,800	21,000	1.3	0.04	0.13	390	1200	390	11000	0.02	0.007	0.3	0.3	<0.005	<0.005	2	0.0017	0.0006
WS1 - S	11/02/2021			8.27	54,769	101	97	<5	130	37,000	20	0.8	<0.5	2,900	20,000	<5	0.04	0.15	400	1200	360	12000	0.02	<0.005	0.5	0.5	<0.005	<0.005	3	0.0025	0.0005
WS1 - S	4/03/2021			8.15	56,880	154	84	<5	120	37,000	<5	0.3	<0.5	3,100	21,000	<5	0.04	0.15	430	1400	410	12000	<0.01	<0.005	0.2	0.2	0.011	<0.005	<1	0.0008	0.0002
WS1 - S	20/04/2021			8.26	52,809	79	86	9	120	37,000	<5	0.6	<0.5	2,700	20,000	<5	0.08	0.14	410	1400	370	12000	0.03	0.006	0.2	0.2	0.01	<1	0.0009	0.0006	
WS1 - S	5/05/2021			8.22	53,594	113	80	8	130	38,000	10	0.8	<0.5	2,500	19,000	<5	0.06	0.13	430	1400	410	12000	0.03	<0.005	<0.5	<0.5	0.012	<0.005	1	0.0008	0.0005
WS1 - S	3/06/2021			8.18	53,956	128	78	7	120	36,000	<5	0.8	<0.5	2,800	20,000	<5	0.06	0.14	470	1500	400	12000	0.02	<0.005	<0.5	<0.5	0.013	<0.005	1	0.0009	0.0005
WS1 - S	15/07/2021			8.02	45,610	112	97	9	120	30,000	10	1.5	<0.5	2,200	16,000	<5	0.08	0.14	310	980	160	8600	0.03	0.01	0.4	0.3	0.047	0.055	3	0.0006	0.0005
WS1 - S	5/08/2021			7.27	13,504	186	92	<5	90	8,700	49	8.7	<0.5	550	4,100	0.3	0.06	0.13	94	250	58	2100	0.06	0.036	1.6	1.0	0.095	0.56	15	0.0018	0.0002
WS1 - D	10/09/2020			8.20	50,935	91	107	9	120	36,000	<5	0.7	<0.5	2,400	18,000	---	0.08	0.13	390	1200	360	11000	0.03	0.005	0.2	0.2	0.008	<0.005	2	0.0008	0.0006
WS1 - D	7/10/2020			8.29	53,399	131	104	7	120	37,000	<5	0.5	0.6	2,500	18,000	<5	0.06	0.14	420	1300	360	11000	0.04	0.005	0.1	0.1	0.006	0.007	2	0.0008	0.0004
WS1 - D	5/11/2020			8.12	51,230	125	80	<5	130	37,000	<5	0.7	<0.5	2,800	20,000	<5	0.04	0.14	350	1200	310	11000	0.02	0.006	0.2	0.2	0.009	<0.005	3	0.0012	0.0005
WS1 - D	3/12/2020			8.08	49,803	178	87	--	130	37,000	<5	0.8	0.6	2,800	20,000	<5	0.04	0.14	410	1300	390	12000	0.02	0.005	0						

Sample ID	Date	Trigger	Field Parameters					Acid Sulfate Soil Parameters and Anions										ASS Ratios		Cations					Nutrients						Miscellaneous		
			pH	E.C.	Redox	DO	Total Acidity (CaCO3)	Total Alkalinity (CaCO3)	TDS	TSS	Turbidity	Sulfide	Sulfate	Chloride	Flouride	Acidity: Alkalinity	Sulfate: Chloride	Calcium	Magnesium	Potassium	Sodium	Total P	Reactive P	Total N	TKN <sup>e</sup>	NH4-N	NOx-N	Dissolved Organic Carbon (DOC)	Chlorophyll "A"	Phaeophytin "A"			
			Units	pH units	µS/cm	mV	%sat	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	-	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L				
			MWG	7.5-8.5	-	-	90-110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03 <sup>a</sup>	0.005 <sup>a</sup>	0.75 <sup>a</sup>	-	0.62 <sup>b</sup>	0.045 <sup>a</sup>	-	0.003 <sup>a</sup>	-			
			RWG	6.5-8.5 <sup>c</sup>	-	-	>80 <sup>c</sup>	-	-	-	-	-	500 <sup>d</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
			ASS	<6	-	-	-	>40	-	-	-	>0.5	-	-	-	>1	>0.5	-	-	-	-	-	-	-	-	-	-	-	-	-			
			LOR	-	-	-	-	5	5	5	0.1	0.5	1	1	0.1	-	-	0.5	0.5	0.5	0.5	0.01	0.005	0.1	0.005	0.005	0.005	1	0.0001	0.0002			
WS3-S	10/09/2020		8.25	50,920	109	128	7	120	35,000	14	1.8	<0.5	2,400	19,000	--	0.06	0.13	390	1200	350	11000	0.04	0.005	0.2	0.2	<0.005	<0.005	2	0.0006	0.0008			
WS3-S	7/10/2020		8.29	52,289	132	115	7	120	37,000	33 <sup>#</sup>	1.6	0.8	2,400	18,000	<5	0.06	0.13	420	1300	400	11000	0.05	0.006	0.2	0.2	0.018	0.043	1	0.0019	0.0009			
WS3-S	5/11/2020		8.15	51,444	126	55	6	120	37,000	7	1	<0.5	2,700	19,000	<5	0.05	0.14	350	1200	310	11000	0.02	0.006	0.2	0.2	0.01	<0.005	2	0.0017	0.0009			
WS3-S	3/12/2020		8.11	49,569	184	98	--	110	38,000	19	2.4	<0.5	2,700	19,000	<5	---	0.14	380	1200	370	12000	0.03	0.006	0.8	0.8	<0.005	<0.005	2	0.0013	0.0011			
WS3-S	13/01/2021		8.19	55,172	102	101	<5	130	38,000	<5	0.5	0.5	2,900	21,000	1.3	0.04	0.14	390	1200	400	11000	0.03 <sup>#</sup>	0.005	0.2	0.2	0.006	0.006	2 <sup>#</sup>	0.0012	0.0006			
WS3-S	11/02/2021		8.28	54,792	106	67	<5	130	37,000	70 <sup>#</sup>	1.5	<0.5	3,000	21,000	<5	0.04	0.14	370	1200	340	11000	0.03	0.006	0.5	0.5	<0.005	<0.005	3	0.0026	0.0021 <sup>#</sup>			
WS3-S	4/03/2021		8.16	56,731	132	81	<5	130	38,000	10	0.4	<0.5	3,000	21,000	<5	0.04	0.14	460	1500	430	13000	0.01	<0.005	0.2	0.2	0.013	<0.005	<1	0.0007	0.0003			
WS3-S	20/04/2021		8.27	52,937	98	63	9	130	37,000	11	0.7	<0.5	2,700	20,000	<5	0.07	0.14	410	1400	380	12000	0.03	0.005	0.2	0.2	0.019	0.008	<1	0.001	0.0005			
WS3-S	5/05/2021		8.23	53,551	18	81	8	130	39,000	<5	0.4	<0.5	2,400	18,000	<5	0.06	0.13	440	1400	400	13000	0.03	<0.005	<0.5	<0.5	0.013	<0.005	1	0.0007	0.0006			
WS3-S	3/06/2021		8.14	52,644	21	71	7	130	38,000	<5	0.9	<0.5	2,700	20,000	<5	0.05	0.14	480	1500	400	13000	0.02	0.005	<0.5	<0.5	0.014	0.006	1	0.0009	0.0005			
WS3-S	15/07/2021		8.03	45,742	132	72	7	120	28,000	43	1.6	<0.5	2,300	17,000	<5	0.06	0.14	310	980	140	8000	0.04	0.01	0.4	0.3	0.045	0.059	3	0.0009	0.0009			
WS3-S	5/08/2021		7.66	11,889	180	66	<5	90	8,000	18	9.2	<0.5	500	3,800	0.3	0.06	0.13	87	220	52	1700	0.07	0.04	1.6	1.0	0.095	0.57	15	0.0061 <sup>#</sup>	0.0046			

Sample ID	Date	Trigger	Field Parameters					Acid Sulfate Soil Parameters and Anions										ASS Ratios		Cations				Nutrients						Miscellaneous		
			pH	E.C.	Redox	DO	Total Acidity (CaCO3)	TDS	TSS	Turbidity	Sulfide	Sulfate	Chloride	Flouride	Acidity: Alkalinity	Sulfate: Chloride	Calcium	Magnesium	Potassium	Sodium	Total P	Reactive P	Total N	TKN <sup>a</sup>	NH4-N	NOx-N	Dissolved Organic Carbon (DOC)	Chlorophyll "A"	Phaeophytin "A"			
			Units	pH units	µS/cm	mV	%sat	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	-	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L				
			MWG	7.5-8.5	-	-	90-110	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03 <sup>a</sup>	0.005 <sup>a</sup>	0.75 <sup>a</sup>	-	0.62 <sup>b</sup>	0.045 <sup>a</sup>	-	0.003 <sup>a</sup>	-			
			RWG	6.5-8.5 <sup>c</sup>	-	-	>80 <sup>c</sup>	-	-	-	-	500 <sup>d</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
			ASS	<6	-	-	-	>40	-	-	-	>0.5	-	-	>1	>0.5	-	-	-	-	-	-	-	-	-	-	-	-	-			
			LOR	-	-	-	-	5	5	5	0.1	0.5	1	1	0.1	-	-	0.5	0.5	0.5	0.5	0.01	0.005	0.1	0.005	0.005	1	0.0001	0.0002			
WS4-S	7/08/2020		8.27	50,809	106	106	6	130	40,000	16	0.6	0.7	3,100	21,000	--	0.05	0.15	400	1300	370	11000	<0.05	0.006	0.2	0.2	0.008	<0.005	1	0.0005	0.0005		
WS4-S	10/09/2020		7.93	50,651	42	109	9	120	35,000	11	0.5	0.6	2,400	18,000	--	0.08	0.13	390	1200	350	11000	0.03	<0.005	0.2	0.2	0.008	0.01	2	0.0007	0.0007		
WS4-S	7/10/2020		7.82	49,672	55	95	8	120	36,000	<5	0.3	0.8	2,300	17,000	<5	0.07	0.14	390	1200	370	10000	0.03	<0.005	0.2	0.2	0.006	0.007	2	0.0016	0.0007		
WS4-S	5/11/2020		7.89	50,039	32	81	7	130	36,000	<5	0.6	<0.5	2,700	19,000	<5	0.05	0.14	340	1100	300	10000	0.02	0.006	0.2	0.2	0.009	0.008	2	0.0013	0.0005		
WS4-S	3/12/2020		7.94	48,677	105	85	--	130	37,000	<5	0.8	0.8	2,700	19,000	<5	--	0.14	400	1200	380	12000	0.02	<0.005	0.6	0.6	<0.005	0.01	3	0.0016	0.0006		
WS4-S	13/01/2021		7.88	54,357	145	83	<5	130	38,000	<5	0.6	0.7	2,800	21,000	1.2	0.04	0.13	390	1200	390	11000	0.03	0.008	0.3	0.3	<0.005	0.01	2	0.0022	0.0007		
WS4-S	11/02/2021		7.99	54,440	100	131	<5	130	37,000	<5	0.8	<0.5	3,000	21,000	<5	0.04	0.14	380	1200	350	11000	0.02	0.009	0.5	0.5	<0.005	0.016	4	0.003	0.0009		
WS4-S	4/03/2021		8.07	56,909	150	82	<5	120	35,000	8	0.4	0.6	3,000	21,000	<5	0.04	0.14	470	1500	440	13000	0.01	0.005	0.2	0.2	0.024	<0.005	<1	0.0006	0.0003		
WS4-S	20/04/2021		8.11	52,228	29	80	8	130	36,000	9	0.4	<0.5	2,700	20,000	<5	0.06	0.14	410	1300	370	11000	0.03	0.008	0.2	0.2	0.024	0.014	<1	0.0015	0.0007		
WS4-S	5/05/2021		8.18	53,220	92	81	10	130	37,000	<5	0.7	<0.5	2,400	18,000	<5	0.08	0.13	460	1500	420	13000	0.04	<0.005	<0.5	<0.5	0.015	<0.005	2	0.0009	0.0006		
WS4-S	3/06/2021		8.18	53,408	151	83	8	120	38,000	<5	0.8	<0.5	2,700	20,000	<5	0.07	0.14	470	1500	390	12000	0.02	<0.005	<0.5	<0.5	0.016	0.009	1	0.0014	0.0004		
WS4-S	15/07/2021		8.03	46,411	107	111	8	120	29,000	12	1.3	<0.5	2,300	17,000	<5	0.07	0.14	320	1000	140	9100	0.03	0.01	0.4	0.3	0.045	0.056	3	0.0006	0.0006		
WS4-S	5/08/2021		7.66	53,948	95	90	7	110	23,000	22	3.9	<0.5	1,800	12,000	0.6	0.06	0.15	180	550	140	5000	0.04	0.023	0.9	0.6	0.064	0.28	10	0.0009	0.0009		
WS4-D	7/08/2020		8.27	50,996	108	105	<5	130	40,000	21	0.5	0.7	2,800	20,000	--	0.04	0.14	420	1300	380	12000	<0.05	<0.005	0.1	0.1	0.007	<0.005	<1	0.0004	0.0006		
WS4-D	10/09/2020		8.05	50,680	56	112	9	120	35,000	7	0.7	<0.5	2,400	18,000	--	0.08	0.13	370	1200	340	10000	0.03	<0.005	0.2	0.2	0.007	0.008	2	0.0008	0.0006		
WS4-D	7/10/2020		8.04	50,044	63	98	8	120	35,000	<5	0.4	<0.5	2,400	18,000	<5	0.07	0.13	410	1300	390	10000	0.03	<0.005	0.1	0.1	0.006	0.01	2	0.0015	0.0006		
WS4-D	5/11/2020		7.97	50,024	40	81	5	120	36,000	6	0.7	<0.5	2,700	19,000	<5	0.04	0.14	350	1200	300	10000	0.02	0.006	0.2	0.2	0.008	0.008	2	0.0012	0.0007		
WS4-D	3/12/2020		7.98	48,630	115	83	--	130	37,000	7	1.1	3.8	2,600	19,000	<5	--	0.14	400	1200	380	12000	0.02	<0.005	0.7	0.7	<0.005	0.008	3	0.0016	0.0006		
WS4-D	13/01/2021		7.98	54,348	124	86	<5	130	37,000	<5	0.6	<0.5	2,800	21,000	1.2	0.04	0.13	390	1200	390	11000	0.03	0.008	0.2	0.2	<0.005	0.04	2	0.0021	0.0007		
WS4-D	11/02/2021		8.08	54,460	102	133	<5	130																								

## Table B

### Surface Water Results: Metals

#### Definitions:

MWG (Marine Water Estuary Guideline) for slightly - moderately disturbed systems, RWG (Recreational Water Guidelines), ASS (Acid Sulfate Soils) Standing Advice from DWER on dewatering trigger values taken from ASS Guideline Series (2015),  
- (No Guideline), --- not tested, LOR (Limit of Reporting), \* value for hexavalent chromium, # duplicate value

#### Notes:

Guideline values have been adopted from the following guidance documentation:

- Treatment and Management of Soil and Water in Acid Sulfate Soil Landscapes (DER 2015b)
- Assessment and Management of Contaminated Sites (DER 2014)
- Freshwater and Marine Water Quality Guidelines Chapter 3 (ANZECC/ARMCANZ 2000)

All results expressed as mg/L except for pH (pH units), ratios (unitless), Redox mV (mili Volts), turbidity (NTU) and EC (µS/cm)

a) Chemicals for which possible bioaccumulation and secondary poisoning should be considered

b) Recreational water guideline values based on drinking water guidelines NHMRC & ARMCANZ (2011) Australian Drinking Water Guidelines

Denotes less than LOR

Sample ID	Date	Trigger	Dissolved Metals & Metalloids																Total Metals			
			Aluminium	Antimony	Arsenic	Cadmium	Cobalt	Chromium	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silicon	Silver	Zinc	Total Aluminium	Total Iron	
			Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
			MWG	-	-	-	-	0.001	-	0.0013	-	0.0044	-	0.0001 <sup>a</sup>	-	-	-	-	0.0014	-	-	1 <sup>b</sup>
WS1 - S	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	---	0.00006	0.002	0.02	0.02	
WS1 - S	7/10/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	<0.5	0.00005	0.003	<0.02	0.02	
WS1 - S	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	<0.5	<0.0001	0.006	0.03	0.03	
WS1 - S	3/12/2020		0.03	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	0.011	<0.00005	0.012	<0.002	<0.002	<1	0.0001	0.006	0.03	0.03	
WS1 - S	13/01/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	0.7	<0.0001	0.005	0.04	0.08	
WS1 - S	11/02/2021		0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<0.5	<0.0001	0.011	0.03	0.04	
WS1 - S	4/03/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.006	0.02	<0.02	
WS1 - S	20/04/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.005	<0.02	<0.02	
WS1 - S	5/05/2021		<0.02	<0.002	0.003	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	<1	<0.0001	0.005	<0.02	0.02	
WS1 - S	3/06/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.003	0.03	0.03	
WS1 - S	15/07/2021		0.03	<0.002	<0.002	<0.0002	<0.002	<0.002	0.003	0.04	0.003	<0.01	<0.00005	0.01	<0.002	<0.002	0.8	<0.0001	0.009	0.03	0.05	
WS1 - S	5/08/2021		0.06	<0.001	<0.001	<0.0001	<0.001	<0.001	0.003	0.003	0.24	<0.001	0.031	<0.00005	0.003	0.001	<0.001	3.3	<0.00005	0.004	0.38	0.83
WS1 - D	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	---	0.00006	0.003	0.03	0.04	
WS1 - D	7/10/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	<0.5	<0.00005	0.002	0.02	<0.02	
WS1 - D	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<0.5	<0.0001	0.004	0.03	0.03	
WS1 - D	3/12/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<1	<0.0001	0.004	0.02	0.02	
WS1 - D	13/01/2021		0.07	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	0.7	0.0002	0.043	0.05	0.07	
WS1 - D	11/02/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.006	0.03	0.03	
WS1 - D	4/03/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.006	<0.02	0.03	
WS1 - D	20/04/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.004	<0.02	<0.02	
WS1 - D	5/05/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	<1	<0.0001	<0.002	0.02	<0.02	
WS1 - D	3/06/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	0.003	>0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.009	<0.02	0.02	
WS1 - D	15/07/2021		0.03	<0.002	<0.002	<0.0002	<0.002	<0.002	0.003	0.04	<0.002	<0.01	<0.00005	0.011	<0.002	<0.002	1	<0.0001	0.01	0.02	0.03	
WS1 - D	5/08/2021		0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	0.002	0.002	<0.001	0.032	<0.00005	0.003	0.001	<0.001	3.6	<0.00005	0.003	0.16	0.48</td	

Sample ID	Date	Trigger	Dissolved Metals & Metalloids																	Total Metals		
			Aluminium	Antimony	Arsenic	Cadmium	Cobalt	Chromium	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silicon	Silver	Zinc	Total Aluminium	Total Iron	
			Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
			MWG	-	-	-	-	0.001	-	0.0013	-	0.0044	-	0.0001 <sup>a</sup>	-	-	-	-	0.0014	-	-	1 <sup>b</sup>
			RWG	-	0.003 <sup>b</sup>	0.007 <sup>b</sup>	0.002 <sup>b</sup>	-	0.05 <sup>b</sup>	2 <sup>b</sup>	-	0.01 <sup>b</sup>	0.5 <sup>b</sup>	0.001 <sup>b</sup>	-	0.02 <sup>b</sup>	0.01 <sup>b</sup>	-	-	-	-	-
WS2-S	7/08/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.012	<0.002	<0.002	---	<0.0001	0.003	<0.02	<0.02	
WS2-S	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.0005	0.012	<0.001	<0.001	---	<0.0005	0.003	0.02	0.02	
WS2-S	7/10/2020		<0.01	<0.001	0.001	<0.0001	<0.001	<0.001	0.002	<0.01	<0.001	<0.005	<0.0005	0.011	<0.001	<0.001	0.7	<0.0005	0.003	<0.02	<0.02	
WS2-S	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.012	<0.002	<0.002	<0.5	<0.0001	0.004	0.03	0.04	
WS2-S	3/12/2020		0.04	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.012	<0.002	<0.002	<1	0.0002	0.0099	0.07	0.02	
WS2-S	13/01/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.015	<0.002	<0.002	0.9	0.0002	0.007	0.09	0.03	
WS2-S	11/02/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	<0.5	<0.0001	0.006	0.03	0.03	
WS2-S	4/03/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	<1	<0.0001	0.007	<0.02	<0.02	
WS2-S	20/04/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	<0.5	<0.0001	0.005	<0.02	<0.02	
WS2-S	5/05/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.014	<0.002	<0.002	<1	<0.0001	0.005	0.02	0.03	
WS2-S	3/06/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	<1	<0.0001	0.003	<0.02	<0.02	
WS2-S	15/07/2021		0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	0.002	0.03	<0.002	<0.01	<0.0005	0.01	<0.002	<0.002	1.0000	<0.0001	0.015	<0.02	0.03	
WS2-S	5/08/2021		0.06	0.001	<0.001	<0.0001	<0.001	<0.001	0.002	0.28	<0.001	0.035	<0.0005	0.002	0.001	<0.001	3.8	<0.0005	0.005	0.17	0.53	
WS2-D	7/08/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.012	<0.002	<0.002	---	<0.0001	0.007	0.03	0.02	
WS2-D	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	0.001	<0.01	<0.001	<0.005	<0.0005	0.012	<0.001	<0.001	---	0.00006	0.003	0.02	0.02	
WS2-D	7/10/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	0.001	<0.01	<0.001	<0.005	<0.0005	0.012	<0.001	<0.001	0.7	<0.0005	0.003	<0.02	<0.02	
WS2-D	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	<0.5	<0.0001	0.007	0.03	0.04	
WS2-D	3/12/2020		0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	<1	<0.0001	0.005	0.03	0.04	
WS2-D	13/01/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	0.9	0.0001	0.004	<0.02	0.03	
WS2-D	11/02/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	<0.5	<0.0001	0.006	0.03	0.03	
WS2-D	4/03/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	<1	<0.0001	0.006	0.03	0.02	
WS2-D	20/04/2021		<0.02	<0.002	<0.002	0.0003 <sup>#</sup>	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.012	<0.002	<0.002	<0.5	<0.0001	0.005	<0.02	<0.02	
WS2-D	5/05/2021		<0.02	<0.002	0.003	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.015	<0.002	<0.002	<1	<0.0001	0.009	<0.02	0.02	
WS2-D	3/06/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.019 <sup>#</sup>	<0.002	<0.002	<1	<0.0005	0.007	<0.02	<0.02	
WS2-D	3/06/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.019 <sup>#</sup>	<0.002	<0.002	<1	<0.0005	0.007	<0.02	<0.02	
WS2-D	15/07/2021		0.03	<0.002	<0.002	<0.0002	<0.002	<0.002	0.002	0.03	<0.002	<0.01	<0.0005	0.01	<0.002	<0.002	0.9</					

Sample ID	Date	Trigger	Dissolved Metals & Metalloids																		Total Metals	
			Aluminium	Antimony	Arsenic	Cadmium	Cobalt	Chromium	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silicon	Silver	Zinc	Total Aluminium	Total Iron	
			Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			MWG	-	-	-	-	0.001	-	0.0013	-	0.0044	-	0.0001 <sup>a</sup>	-	-	-	-	0.0014	-	-	1 <sup>b</sup>
			RWG	-	0.003 <sup>b</sup>	0.007 <sup>b</sup>	0.002 <sup>b</sup>	-	0.05 <sup>b</sup>	2 <sup>b</sup>	-	0.01 <sup>b</sup>	0.5 <sup>b</sup>	0.001 <sup>b</sup>	-	0.02 <sup>b</sup>	0.01 <sup>b</sup>	-	-	-	-	-
WS4-S	7/08/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.012	<0.002	<0.002	---	0.0002	0.004	0.02	0.03	
WS4-S	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.0005	0.012	<0.001	<0.001	---	<0.0005	0.002	0.02	0.02	
WS4-S	7/10/2020		<0.01	<0.001	0.001	<0.0001	<0.001	<0.001	<0.001	0.001	<0.01	<0.001	<0.005	<0.0005	0.012	<0.001	<0.001	0.6	<0.0005	0.003	<0.02	<0.02
WS4-S	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.012	<0.002	<0.002	<0.5	<0.0001	0.004	0.03	0.04	
WS4-S	3/12/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	<1	<0.0001	0.004	0.03	0.03	
WS4-S	13/01/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.014	<0.002	<0.002	0.9	0.0002	0.003	0.03	0.04	
WS4-S	11/02/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.014	<0.002	<0.002	<0.5	<0.0001	0.006	0.04	0.03	
WS4-S	4/03/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	<1	<0.0001	0.005	<0.02	<0.02	
WS4-S	20/04/2021		0.04	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	0.6	<0.0001	0.019	<0.02	<0.02	
WS4-S	5/05/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.015	<0.002	<0.002	<1	<0.0001	0.006 <sup>#</sup>	<0.02	<0.02	
WS4-S	3/06/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.012	<0.002	<0.002	1.0	<0.0001	0.037	<0.02	<0.02	
WS4-S	15/07/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	0.002	<0.02	<0.002	<0.01	<0.0005	0.0099	<0.002	<0.002	0.9	<0.0001	0.008	<0.02	0.02	
WS4-S	5/08/2021		0.03	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	0.16	<0.001	0.022	<0.0005	0.005	<0.001	<0.001	2.7	<0.00005	0.001	0.11	0.31	
WS4-D	7/08/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.012	<0.002	<0.002	---	<0.0001	0.003	<0.02	<0.02	
WS4-D	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.0005	0.012	<0.001	<0.001	---	<0.0005	0.002	0.02	0.02	
WS4-D	7/10/2020		<0.01	<0.001	0.001	<0.0001	<0.001	<0.001	0.001	<0.01	<0.001	<0.005	<0.0005	0.012	<0.001	<0.001	0.6	<0.0005	0.003	<0.02	<0.02	
WS4-D	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.015	<0.002	<0.002	<0.5	<0.0001	0.004	0.04	0.04	
WS4-D	3/12/2020		0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.012	<0.002	<0.002	<1	<0.0001	0.003	0.03	0.03	
WS4-D	13/01/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.014	<0.002	<0.002	0.9	0.0001	0.006	0.03	0.03	
WS4-D	11/02/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	<0.5	<0.0001	0.011	0.04	0.03	
WS4-D	4/03/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	<1	<0.0001	0.008	<0.02	<0.02	
WS4-D	20/04/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	0.6	<0.0001	0.01	<0.02	<0.02	
WS4-D	5/05/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.014	<0.002	<0.002	<1	<0.0001	0.004	0.04	<0.02	
WS4-D	3/06/2021		<0.02	0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.0005	0.013	<0.002	<0.002	<1	<0.0001	0.003	<0.02	<0.02	
WS4-D	15/07/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	0.002	<0.02	<0.002	<0.01	<0.0005	0.01	<0.002	<0.002	0.9	<0.0001	0.008	0.03	0.04	
WS4-D	5/08/2021		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	0.03	<0.001	0.008	<0.0005	0.0								

Sample ID	Date	Trigger	Dissolved Metals & Metalloids																		Total Metals	
			Aluminium	Antimony	Arsenic	Cadmium	Cobalt	Chromium	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silicon	Silver	Zinc	Total Aluminium	Total Iron	
			Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			MWG	-	-	-	-	0.001	-	0.0013	-	0.0044	-	0.0001 <sup>a</sup>	-	-	-	-	0.0014	-	-	1 <sup>b</sup>
WS5-D	7/10/2020		RWG	-	0.003 <sup>b</sup>	0.007 <sup>b</sup>	0.002 <sup>b</sup>	-	0.05 <sup>b</sup>	2 <sup>b</sup>	-	0.01 <sup>b</sup>	0.5 <sup>b</sup>	0.001 <sup>b</sup>	-	0.02 <sup>b</sup>	0.01 <sup>b</sup>	-	-	-	-	-
WS5-D	5/11/2020		ASS	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WS5-D	3/12/2020		LOR	0.01	0.002	0.001	0.0001	0.002	0.001	0.002	0.05	0.001	0.001	0.00005	0.001	0.001	0.01	0.1	0.00005	0.005	0.01	0.01
WS5-D	13/01/2021			<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	<0.5	<0.00005	0.002	<0.02	<0.02
WS5-D	11/02/2021			<0.02	<0.002	<0.002	<0.0002	<0.002	<0.005	<0.002	0.04	<0.002	<0.01	<0.00005	0.013	0.022	<0.002	<1	<0.0001	0.019	0.03	0.03
WS5-D	4/03/2021			0.04	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	0.8	0.0001	0.01	0.02	0.02
WS5-D	20/04/2021			0.03	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.006	0.03	0.03
WS5-D	5/05/2021			0.03	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.005	<0.02	<0.02
WS5-D	3/06/2021			0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<1	<0.0001	0.005	<0.02	<0.02
WS5-D	15/07/2021			0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.0099	<0.002	<0.002	0.9	<0.0001	0.016	<0.02	0.02
WS5-D	5/08/2021			0.05	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	0.003	<0.01	<0.00005	0.0099	<0.001	<0.001	2.7	<0.00005	<0.001	0.09	0.3
			0.03	<0.001	0.001	<0.0001	<0.001	<0.001	<0.001	0.17	<0.001	0.028	<0.00005	0.005	<0.001	<0.001	-	-	-	-	-	-





**Table E**  
**Surface Water Results: Per- and Poly-Fluoroalkyl Substances**

**Definitions:** LOR (Limits of Reporting), MWG (Marine Water Guideline) -99 (99% species protection level) -95 (95% species protection level), RWG (Recreational Water Guidelines)

- denotes no guideline. --- denotes not tested

## Notes

All values in  $\mu\text{g/L}$  unless specified otherwise

All guideline values are adapted from:

All guideline values are adopted from the BEA's National Income and Product Accounts.

- PFAS Nation  
Donates \$1.0M

Denotes <LUR

10. The following table shows the number of hours worked by 1000 workers in a certain industry.

Sample ID	Date	Trigger	Perfluoroalkyl Sulfonic Acids						Perfluoroalkyl Carboxylic Acids						(n:2) Fluorotelomer Sulfonic Acids				Perfluoroalkyl Sulfonamides				PFAS Sums																
			Perfluorobutanesulfonic acid			Perfluoropentanesulfonic acid			Perfluorohexanesulfonic acid			Perfluoroheptanesulfonic acid			Perfluoroctanesulfonate/PFOS			Perfluoroheptanoic acid PFOA			Perfluoroctanoic acid			Perfluorododecanoic acid			Perfluorotetradecanoic acid			Perfluorooctane sulfonamide		N-Et methyl perfluorooctanesulfonamido-ethanol		N-Me perfluorooctanesulfonamido-ethanol		Total Positive PFHxS & PFOS		Total Positive PFAS	
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L						
			0.00023	-	-	0.13	-	-	-	-	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
MWG-99	MWG-95	RWG	-	-	-	-	-	-	-	-	-	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
			-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
			2	-	2	-	-	-	-	-	-	0.002	0.002	0.002	0.004	0.004	0.002	0.001	0.002	0.002	0.005	0.01	0.05	0.001	0.004	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002						
			0.0004	0.001	0.0002	0.001	0.0002	0.002	0.002	0.002	0.004	0.0003	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
			0.00023	-	-	-	-	-	-	-	-	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
			0.00023	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
			0.00023	-	-	-	-	-	-	-	-	0.002	0.002	0.002	0.005	0.005	0.001	0.001	0.002	0.002	0.005	0.01	0.05	0.001	0.004	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002						
			0.00023	-	-	-	-	-	-	-	-	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
			0.00023	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
			0.00023	-	-	-	-	-	-	-	-	0.002	0.002	0.002	0.005	0.005	0.001	0.001	0.002	0.002	0.005	0.01	0.05	0.001	0.004	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002						
WS1 - S	10/09/2020		0.0004	<0.001	0.0020	<0.001	0.0030	<0.002	<0.002	<0.002	<0.002	0.0003	<0.002	<0.002	<0.002	<0.001	0.0004	0.0006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005							
WS1 - S	7/10/2020		<0.0004	<0.001	0.0020	<0.001	0.0021	<0.002	<0.002	<0.002	<0.002	0.0008	<0.004	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005							
WS1 - S	5/11/2020		0.0004	<0.001	0.0020	<0.001	0.0025	<0.002	<0.002	<0.002	<0.002	0.001	0.0005	0.0007	<0.001	<0.002	<0.002	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005							
WS1 - S	3/12/2020		<0.0004	<0.001	0.0020	<0.001	0.0024	<0.002	<0.002	<0.002	<0.002	0.0009	0.002	0.0006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005							
WS1 - S	13/01/2021		<0.0004	<0.001	0.0010	<0.001	0.0020	<0.002	<0.002	<0.002	<0.002	0.0008	0.0004	0.0006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005							
WS1 - S	11/02/2021		0.0007	<0.001	0.0020	<0.001	0.0023	<0.002	<0.002	<0.002	<0.002	0.0009	0.0007	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005							
WS1 - S	4/03/2021		<0.0004	<0.001	0.0002	<0.001	0.0004	<0.002	<0.002	<0.002	<0.002	0.0004	0.0004	0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005							
WS1 - S	20/04/2021		<0.0004	<0.001	0.0006	<0.001	0.0010	<0.002	<0.002	<0.002	<0.002	0.0004	0.0004	0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005							
WS1 - S	5/05/2021		<0.0004	<0.001	0.0005	<0.001	0.0007	<0.002	<0.002	<0.002	<0.002	0.0003	0.0003	0.0001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005							
WS1 - S	3/06/2021		<0.0004	<0.001	0.0005	<0.001	0.0009	<0.002	<0.002	<0.002	<0.002	0.0004	0.0004	0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005							
WS1 - S	15/07/2021		0.0006	<0.001	0.0026	<0.001	0.0046	<0.002	<0.002	<0.002	<0.002	0.0008	0.0007	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005							
WS1 - S	15/07/2021		0.0008	<0.001	0.0032	<0.001	0.0064	<0.002	<0.002	<0.002	<0.002	0.001	0.0004	0.0010	<0.001	<0.002	<0.002	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005							
WS1 - S	5/08/2021		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
WS1 - D	10/09/2020		<0.0004	<0.001	0.0020	<0.001	0.0026	<0.002	<0.002	<0.002	<0.002	0.0004	<0.002	<0.002	<0.002	<0.001	0.0006	<0.002	<0.002	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005							
WS1 - D	7/10/2020		<0.0004	<0.001	0.0020	<0.001	0.0024	<0.002	<0.002	<0.002	<0.002	0.0007	<0.004																										

**Table E**  
**Surface Water Results: Per- and Poly-Fluoroalkyl Substances**

**Definitions:** LOR (Limits of Reporting), MWG (Marine Water Guideline) -99 (99% species protection level) -95 (95% species protection level), RWG (Recreational Water Guidelines)

- denotes no guideline. --- denotes not tested

## Notes:

All values in  $\mu\text{g/L}$  unless specified otherwise

Table uses colour coding for data interpretation, avoid black and white reproduction.  
All guideline values are adapted from:

All guideline values are adopted from  
PEAQ National Enviro

- PFAS National Report and Q&A

Denotes <LOR

ANSWER

Figure 1. The relationship between the number of species and the area of forest cover in each state.

**Table F**  
**Surface Water QAQC Results (RPD Assessment): ASS, Cations, Nutrients and Miscellaneous**

**Definitions:**

LOR 1° (Limit of Reporting, Primary Laboratory). --- denotes not tested. # denotes not calculated.

**Notes:**

All values in mg/L unless specified otherwise

Table uses colour coding for data interpretation, avoid black and white reproduction.

denotes <LOR (primary laboratory)
denotes <5x LOR (primary laboratory)
denotes exceedance of acceptance criteria (30%) where samples <5x LOR
denotes exceedance of acceptance criteria (30%) where sample(s) >5x LOR

Sample ID	Sample Type	Date	Trigger	Acid Sulfate Soil Parameters												Cations						Nutrients						Miscellaneous		
				Total Acidity (CaCO <sub>3</sub> )	Total Alkalinity (CaCO <sub>3</sub> )	TDS	TSS	Turbidity	Sulfide	Sulfate	Chloride	Fluoride	Calcium	Magnesium	Potassium	Sodium	Total P	Reactive P	Total N	TKN	NH <sub>3</sub> -N	NO <sub>x</sub> -N	Dissolved Organic Carbon (DOC)	Chlorophyll "a"	Phaeophytin "a"					
				Units	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L				
				LOR	1	1	10	5	0.1	0.1	1	1	0.1	1	1	1	0.01	0.005	0.1	0.1	0.005	0.005	1	0.0001	0.0002					
WS2-S	Primary	7/08/2020			6	120	39,000	9	0.6	0.9	2800	20,000	---	420	1,300	370	12,000	<0.05	<0.005	0.1	0.1	0.007	<0.005	<1	0.0004	0.0005				
WZ1	Duplicate				7	120	39,000	6	0.6	0.8	2800	20,000	---	420	1,300	370	11,000	<0.05	<0.005	0.1	0.1	0.009	<0.005	<1	0.0005	0.0003				
RPD %					15	0	0	40	0	12	0	0	#	0	0	0	9	0	0	0	2	25	0	0	22	50				
WS1-S	Primary	10/09/2020			9	120	36,000	<5	0.5	<0.5	2400	18,000	---	390	1,200	360	11,000	0.03	0.006	0.2	0.20	0.009	<0.005	2	0.0012	0.0006				
WZ1	Duplicate				9	120	36,000	6	0.7	<0.5	2300	18,000	---	400	1,300	360	11,000	0.03	<0.005	0.2	0.20	0.008	<0.005	2	0.0012	0.0005				
RPD %					0	0	0	18	33	0	4	0	#	3	8	0	0	0	18	0	0	12	0	0	0	18				
WS3-S	Primary	7/10/2020			7	120	37,000	8	1.6	0.8	2400	18,000	<5	420	1,300	400	11,000	0.05	0.006	0.2	0.20	0.018	0.043	1	0.0019	0.0009				
WZ1	Duplicate				7	130	37,000	33	0.9	0.7	2400	18,000	<5	410	1,300	390	11,000	0.05	0.005	0.1	0.10	<0.005	<0.005	1	0.0011	0.0008				
RPD %					0	8	0	122	56	13	0	0	0	2	0	3	0	0	18	67	67	113	158	0	53	12				
WS2-D	Primary	5/11/2020			6	130	36,000	<5	0.8	<0.5	2700	19,000	<5	330	1,100	290	9,700	0.02	0.006	0.2	0.2	0.006	0.01	3	0.0016	0.0007				
WZ1	Duplicate				7	130	36,000	<5	1	<0.5	2700	19,000	<5	360	1,200	320	11,000	0.02	0.006	0.2	0.2	0.006	0.01	2	0.0015	0.0006				
RPD %					15	0	0	0	22	0	0	0	0	9	9	10	13	0	0	0	0	0	0	40	6	15				
WS2-S	Primary	3/12/2020			---	130	36,000	<5	0.7	0.6	2700	19,000	<5	400	1,300	380	12,000	0.02	<0.005	0.8	0.8	<0.005	0.01	3	0.0022	0.0006				
WZ1	Duplicate				---	130	36,000	<5	0.9	0.7	2700	19,000	<5	400	1,300	380	12,000	0.02	<0.005	0.7	0.7	<0.005	0.011	3	0.0018	0.0006				
RPD %					---	0	0	0	25	15	0	0	0	0	0	0	0	0	0	13	13	0	10	0	20	0				
WS2-S	Primary	13/01/2021			<5	130	38,000	<5	0.5	0.5	2900	21,000	1.3	390	1,200	400	11,000	0.02	0.005	0.2	0.2	0.006	0.006	1	0.0012	0.0006				
WZ1	Duplicate				<5	130	39,000	<5	0.5	0.5	2800	21,000	1.3	390	1,200	390	11,000	0.03	0.006	0.2	0.2	0.007	<0.005	2	0.0011	0.0005				
RPD %					0	0	3	0	0	0	4	0	0	0	0	3	0	40	0	0	0	0	0	18	67	9	18			
WS3-S	Primary	11/02/2021			<5	130	37,000	38	1.5	<0.5	3000	21,000	<5	370	1,200	340	11,000	0.03	0.006	0.5	0.5	<0.005	<0.005	3	0.0026	0.001				
WZ1	Duplicate				<5	130	37,000	79	2	<0.5	3000	21,000	<5	390	1,200	350	12,000	0.1	0.006	0.5	0.5	<0.005	<0.005	2	0.003	0.0021				
RPD %					0	0	0	0	29	0	0	0	0	5	0	3	9	108	0	0	0	0	0	40	14	71				
WS2-D	Primary	4/03/2021			<5	130	34,000	<5	0.7	<0.5	3000	21,000	<5	430	1,400	400	12,000	0.01	0.006	0.2	0.2	0.021	<0.005	<1	0.0008	0.0003				
WZ1	Duplicate				<5	130	38,000	22	0.5	0.9	3000	21,000	<5	470	1,500	430	13,000	0.01	<0.005	0.2	0.2	0.023	<0.005	<1	0.0007	0.0004				
RPD %					0	0	11	126	33	57	0	0	0	9	7	7	8	0	18	0	0	9	0	0	13	29				

Sample ID	Sample Type	Date	Trigger	Acid Sulfate Soil Parameters										Cations				Nutrients						Miscellaneous		
				Total Acidity (CaCO3)	Total Alkalinity (CaCO3)	TDS	TSS	Turbidity	Sulfide	Sulfate	Chloride	Fluoride	Calcium	Magnesium	Potassium	Sodium	Total P	Reactive P	Total N	TKN	NH3-N	NOx-N	Dissolved Organic Carbon (DOC)	Chlorophyll "a"	Phaeophytin "a"	
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
				LOR	1	1	10	5	0.1	0.1	1	1	0.1	1	1	1	1	0.01	0.005	0.1	0.1	0.005	0.005	1	0.0001	0.0002
WS2-D	Primary	3/06/2021			7	120	38,000	<5	0.8	<0.5	2700	20,000	<5	460	1,400	390	12,000	0.02	0.006	<0.5	<0.5	0.018	0.019	1	0.001	0.0006
WZ1	Duplicate				7	120	39,000	<5	0.5	<0.5	2700	20,000	<5	510	1,600	420	13,000	0.02	0.006	<0.5	<0.5	0.022	0.03	1	0.001	0.0004
RPD %					0	0	3	0	46	0	0	0	0	10	13	7	8	0	0	0	0	20	45	0	0	40
WS3-S	Primary	15/07/2021			7	120	28,000	43	1.6	<0.5	2300	17,000	<5	310	980	140	8,000	0.04	0.01	0.4	0.341	0.045	0.059	3	0.0009	0.0009
WZ1	Duplicate				9	120	27,000	14	1.1	<0.5	2200	16,000	<5	300	920	130	8,200	0.04	0.01	0.4	0.342	0.049	0.058	3	0.0011	0.0009
RPD %					25	0	4	102	37	0	4	6	0	3	6	7	2	0	0	0	0	9	2	0	20	0
WS3-S	Primary	5/08/2021			<5	90	8,000	18	9.2	<0.5	500	3,800	0.3	87	220	52	1,700	0.07	0.04	1.6	1.0	0.095	0.57	15	0.0025	0.0046
WZ1	Duplicate				<5	92	7,500	22	12	<0.5	490	3,700	0.3	85	220	51	1,600	0.08	0.039	1.6	1.0	0.088	0.60	15	0.0061	0.0037
RPD %					0	2	6	20	26	0	2	3	0	2	0	2	6	13	3	0	3	8	5	0	84	22

**Table G**  
**Surface Water QAQC Results (RPD Assessment): Metals**

**Definitions:**

LOR<sup>1</sup> (Limit of Reporting, Primary Laboratory). --- denotes not tested. # denotes not calculated.

**Notes:**

All values in mg/L unless specified otherwise

Table uses colour coding for data interpretation, avoid black and white reproduction.

denotes <LOR (primary laboratory)

denotes <5x LOR (primary laboratory)

denotes exceedance of acceptance criteria (30%) where samples <5x LOR

denotes exceedance of acceptance criteria (30%) where sample(s) >5x LOR

Sample ID	Sample Type	Date	Trigger	Dissolved Metals & Metalloids																Total Metals			
				Units	Aluminum	Antimony	Arsenic	Cadmium	Cobalt	Chromium	Copper	Iron	Lead	Mercury	Manganese	Molybdenum	Nickel	Selenium	Silicon	Silver	Zinc	Total Aluminum	Total Iron
				LOR	0.01	0.001	0.001	0.0001	0.001	0.001	0.001	0.01	0.001	0.005	0.00005	0.001	0.001	0.1	0.00005	0.001	0.01	0.01	
WS2-S	Primary	7/08/2020	/	<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.012	<0.002	<0.002	---	<0.0001	0.003	<0.02	
WZ1	Duplicate			<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.013	<0.002	<0.002	---	<0.0001	0.004	0.03	
RPD %				0	0	0	0	0	0	0	0	0	0	0	8	0	0	#	0	29	40	0	
WS1-S	Primary	10/09/2020	/	<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.00005	<0.005	0.012	<0.001	<0.001	---	0.00006	0.002	0.02	
WZ1	Duplicate			<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.00005	<0.005	0.013	<0.001	<0.001	---	<0.00005	0.003	0.02	
RPD %				0	0	0	0	0	0	0	0	0	0	0	8	0	0	#	18	40	0	40	
WS3-S	Primary	7/10/2020	/	<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.00005	<0.005	0.013	<0.001	<0.001	<5	<0.00005	0.003	0.02	
WZ1	Duplicate			<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.00005	<0.005	0.012	<0.001	<0.001	<5	<0.00005	0.004	<0.02	
RPD %				0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	29	0	133	
WS2-D	Primary	5/11/2020	/	<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.013	<0.002	<0.002	<5	<0.0001	0.007	0.03	
WZ1	Duplicate			<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.013	<0.002	<0.002	<5	<0.0001	0.005	0.03	
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	0	0
WS2-S	Primary	3/12/2020	/	0.04	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.012	<0.002	<0.002	<1	0.0002	0.0099	0.07	
WZ1	Duplicate			<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.013	<0.002	<0.002	<1	<0.0001	0.005	<0.02	
RPD %				67	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	66	111	0	
WS3-S	Primary	13/01/2021	/	<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.014	<0.002	<0.002	<5	0.0001	0.005	0.02	
WZ1	Duplicate			<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.016	<0.002	<0.002	<5	<0.0001	0.005	<0.02	
RPD %				0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	40	
WS3-S	Primary	11/02/2021	/	<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.014	<0.002	<0.002	<5	<0.0001	0.026	0.14	
WZ1	Duplicate			<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.013	<0.002	<0.002	<5	<0.0001	0.008	0.19	
RPD %				0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	106	30	19
WS2-D	Primary	4/03/2021	/	<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.013	<0.002	<0.002	<1	<0.0001	0.006	0.03	
WZ1	Duplicate			<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.013	<0.002	<0.002	<1	<0.0001	0.005	0.05	
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	50	0
WS2-D	Primary	20/04/2021	/	<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.012	<0.002	<0.002	<5	<0.0001	0.005	<0.02	
WZ1	Duplicate			<0.02	<0.002	<0.002	<0.0003	<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.012	<0.002	<0.002	<5	<0.0001	0.005	0.0	

**Table H**  
**Surface Water QAQC Results (RPD Assessment): MTBE, BTEX and TRH**

**Definitions:**

LOR 1° (Limit of Reporting, Primary Laboratory). --- denotes not tested. # denoted not calculated.

**Notes:**

All values in mg/L unless specified otherwise

Table uses colour coding for data interpretation, avoid black and white reproduction.

denotes <LOR (primary laboratory)

denotes <5x LOR (primary laboratory)

denotes exceedance of acceptance criteria (30%) where samples <5x LOR

denotes exceedance of acceptance criteria (30%) where sample(s) >5x LOR

Sample ID	Sample type	Date	Trigger	MTBE	BTEX					TRH					Polycyclic Aromatic Hydrocarbons												Total Carcinogenic	Total PAHs	Total Positive PAHs			
					MTBE		Benzene	Toluene	Ethylbenzene	m+p-xylene	o-xylene	F1: C6-C10 minus	F2: C>10-C16 minus N	F3: C>16-C34	F4: C>34-C40	Naphthalene	Aceanaphthylene	Aceanaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo[b,j+k]fluoranthene	Indeno[1,2,3-c,d]pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene	Total Carcinogenic	Total PAHs	Total Positive PAHs
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
				LOR	0.001	0.001	0.001	0.001	0.002	0.001	0.01	0.05	0.1	0.1	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
WS2-S	Primary	7/08/2020		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
WZ1	Duplicate			<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
WS1-S	Primary	10/09/2020		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
WZ1	Duplicate			<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
WS3-S	Primary	7/10/2020		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
WZ1	Duplicate			<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
WS2-D	Primary	5/11/2020		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
WZ1	Duplicate			<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
WS2-S	Primary	3/12/2020		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
WZ1	Duplicate			<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
WS3-S	Primary	13/01/2021		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
WZ1	Duplicate			<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001																		

**Table I**  
**Surface Water QAQC Results (RPD Assessment): OC/OP Pesticides**

## Definitions:

LOR 1° (Limit of Reporting, Primary Laboratory). --- denotes not tested. # denotes not calculated.

## Notes:

All values in mg/L unless specified otherwise

Table uses colour coding for data interpretation, avoid black and white reproduction

	denotes <LOR (primary laboratory)
	denotes <5x LOR (primary laboratory)
	denotes exceedance of acceptance criteria (30%) where samples <5x LOR
	denotes exceedance of acceptance criteria (30%) where sample(s) >5x LOR

**Table J**  
**Surface Water QAQC Results (RPD Assessment): Per- and Poly-Fluoroalkyl Substances**

## Definitions:

LOR 1° (Limit of Reporting, Primary Laboratory). --- denotes not tested. # denotes not calculated.

## Notes

All values in mg/L unless specified otherwise

Table uses colour coding for data interpretation, avoid black and white reproduction.

	denotes <LOR (primary laboratory)
	denotes <5x LOR (primary laboratory)
	denotes exceedance of acceptance criteria (30%) where samples <5x LOR
	denotes exceedance of acceptance criteria (30%) where sample(s) >5x LOR

Sample ID	Sample type	Date	Trigger	Perfluoroalkyl Sulfonic Acids										Perfluoroalkyl Carboxylic Acids										(n:2) Fluorotelomer Sulfonic Acids					Perfluoroalkyl Sulfonamides			PFAS Sums				
				PFOS					PFOA					FTSA					FTSA					Sulfonamide					PFHxS & PFOA			Total Positive PFOS & PFOA				
				Perfluorobutanesulfonic acid µg/L	Perfluoropentanesulfonic acid µg/L	Perfluorohexanesulfonic acid µg/L	Perfluorheptanesulfonic acid µg/L	Perfluoroctanesulfonic acid µg/L	Perfluorooctanesulfonate PFOS µg/L	Perfluorobutanoic acid µg/L	Perfluorohexanoic acid µg/L	Perfluoropentanoic acid µg/L	Perfluoroctanoic acid PFOA µg/L	Perfluorohexanoic acid µg/L	Perfluoropentanoic acid µg/L	Perfluoroctanoic acid µg/L	Perfluorododecanoic acid µg/L	Perfluorotridecanoic acid µg/L	Perfluotetradecanoic acid µg/L	4:2 FTSA µg/L	6:2 FTSA µg/L	8:2 FTSA µg/L	10:2 FTSA µg/L	Perfluorooctane sulfonamide µg/L	N-Ethyl perfluoroctanesulfonamide µg/L	N-Me perfluoroctanesulfonamide µg/L	N-Et perfluoroctanesulfonamid- oethanol µg/L	MePerfluoroctanesulf- amid oacetic acid µg/L	EPerfluoroctanesulf- amid oacetic acid µg/L	Total Positive PFHxS & PFOA µg/L	Total Positive PFAS µg/L					
				LOR	0.0004	0.001	0.0002	0.001	0.0002	0.002	0.002	0.0004	0.0004	0.0002	0.001	0.002	0.005	0.01	0.001	0.0004	0.0004	0.002	0.01	0.005	0.01	0.005	0.01	0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0002	0.0002	0.0002
WS2-S	Primary	7/08/2020		<0.0004	<0.001	0.0005	<0.001	0.0005	<0.002	<0.002	<0.0004	<0.0004	0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.002	<0.002	0.0001	0.0007	0.0007		
WZ1	Duplicate			<0.0004	<0.001	0.0004	<0.001	0.0006	<0.002	<0.002	<0.0004	<0.0004	0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.005	<0.002	<0.002	0.001	0.0008	0.0008			
RPD %				0	0	22	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0			
WS1-S	Primary	10/09/2020		0.0004	<0.001	0.002	<0.001	0.003	<0.002	<0.002	<0.0004	<0.0004	0.0006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.002	<0.002	0.005	0.0036	0.0036		
WZ1	Duplicate			<0.0004	<0.001	0.002	<0.001	0.0026	<0.002	<0.002	<0.0004	<0.0004	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.005	<0.002	<0.002	0.0046	0.0031	0.006			
RPD %				0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	15	19			
WS1-S	Primary	7/10/2020		<0.0004	<0.001	0.001	<0.001	0.0021	<0.002	<0.002	<0.0004	<0.0004	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.002	<0.002	0.0031	0.0026	0.004		
WZ1	Duplicate			<0.0004	<0.001	0.002	<0.001	0.0028	<0.002	<0.002	<0.0004	<0.0004	0.0004	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.005	<0.002	<0.002	0.0048	0.0032	0.006			
RPD %				0	0	67	0	29	0	0	0	25	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	21	35			
WS2-D	Primary	5/11/2020		0.0006	<0.001	0.002	<0.001	0.0035	<0.002	<0.002	<0.0004	<0.0004	0.0009	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.002	<0.002	0.0059	0.0044	0.01		
WZ1	Duplicate			0.0006	<0.001	0.002	<0.001	0.0031	<0.002	<0.002	<0.0002	<0.0002	0.0008	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.002	<0.002	0.0053	0.0039	0.009		
RPD %				0	0	9	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	12	6			
WS2-S	Primary	3/12/2020		0.0005	<0.001	0.002	<0.001	0.0045	<0.002	<0.002	<0.0004	<0.0004	0.0008	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.002	<0.002	0.0066	0.0053	0.011		
WZ1	Duplicate			0.0005	<0.001	0.002	<0.001	0.0038	<0.002	<0.002	<0.0004	<0.0004	0.0003	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.002	<0.002	0.006	0.0047	0.01		
RPD %				0	0	5	0	17	0	0	0	0	0	0	40	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	12	0			
WS3-S	Primary	13/01/2021		<0.0004	<0.001	0.001	<0.001	0.001	<0.002	<0.002	<0.0004	<0.0004	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.002	<0.002	0.002	0.002	0.002		
WZ1	Duplicate			<0.0004	<0.001	0.001	<0.001	0.001	<0.002	<0.002	<0.0004	<0.0004	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.002	<0.002	0.002	0.002	0.002		
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
WS3-S	Primary	11/02/2021		0.0009	<0.001	0.002	<0.001	0.0024	<0.002	<0.002	<0.0004	<0.0004	0.0006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.002	<0.002	0.0044	0.0029	0.007		
WZ1	Duplicate			0.0008	<0.001	0.002	<0.001	0.002	<0.002	<0.002	<0.0004	<0.0004	0.0006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.002	<0.002	0.004	0.0026	0.006		
RPD %				0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	11	7		
WS2-D	Primary	4/03/2021		<0.0004	<0.001	0.0004	<0.001	0.0007	<0.002	<0.002	<0.0004	<0.0004	0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.002	<0.002	0.001	0.0009	0.000		
WZ1	Duplicate			<0.0004	<0.001	0.0005	<0.001	0.0009	<0.002	<0.002	<0.0004	<0.0004	0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.002	<0.002	0.001	0.0009	0.000		
RPD %				0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WS2-D	Primary	20/04/2021		<0.0004	<0.001	0.0005	<0.																													

**Table K**  
**Surface Water QAQC Results (Rinsate, Field Blank and Trip-Blank): Metals and Turbidity**

**Definitions:**

LOR 1° (Limit of Reporting, Primary Laboratory), --- denotes not tested.

**Notes:**

All values in mg/L unless specified otherwise

Table uses colour coding for data interpretation, avoid black and white reproduction.

denotes <LOR (primary laboratory)

denotes exceedance of acceptance criteria > LOR

Sample ID	Sample Type	Date	Trigger	Dissolved Metals & Metalloids																Total Metals	Turbidity			
				Aluminium	Antimony	Arsenic	Cadmium	Cobalt	Chromium	Copper	Iron	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Silicon	Silver	Zinc				
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L				
				LOR	0.01	0.001	0.001	0.0001	0.001	0.001	0.01	0.005	0.00005	0.001	0.001	<0.001	0.001	0.1	0.00005	0.001	0.01	0.01		
<b>Rinsates</b>																								
WR1	Water	7/08/2020		<0.01	<0.001	<0.001	0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	---	<0.00005	<0.001	<0.01	<0.01	0.2	
WR1	Water	10/09/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	---	<0.00005	<0.001	<0.01	<0.01	0.1	
WR1	Water	7/10/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	---	<0.00005	<0.001	<0.01	<0.02	<0.1	
WR1	Water	5/11/2020		<0.01	<0.001	<0.001	0.0002	<0.001	<0.001	0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	0.3	<0.00005	0.005	<0.01	<0.01	0.3	
WR1	Water	3/12/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	0.008	0.01	<0.005	<0.00005	<0.001	<0.001	0.021	<0.001	---	<0.00005	0.015	<0.01	0.02	0.5	
WR1	Water	13/01/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	0.2	<0.00005	<0.001	<0.01	<0.02	<0.1	
WR1	Water	11/02/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.01	<0.005	<0.00005	<0.002	<0.002	<0.002	<0.002	0.2	<0.00001	0.006	<0.02	0.02	0.2
WR1	Water	4/03/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	<0.1	<0.00005	0.001	<0.01	<0.01	0.4	
WR1	Water	20/04/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	<0.1	<0.00005	0.004	<0.01	<0.01	0.4	
WR1	Water	5/05/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	<0.1	<0.00005	<0.001	<0.01	<0.01	0.4	
WR1	Water	3/06/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.1	<0.00005	<0.001	<0.01	<0.01	0.2	
WR1	Water	15/07/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.1	<0.00005	0.005	<0.01	<0.01	1.4	
WR1	Water	5/08/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.1	<0.00005	<0.001	<0.01	<0.01	0.4	
<b>Field Blank</b>																								
WB1	Water	7/08/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	---	<0.00005	<0.001	<0.01	<0.01	0.2	
WB1	Water	10/09/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	---	<0.00005	<0.001	<0.01	<0.01	0.1	
WB1	Water	7/10/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	---	<0.00005	<0.001	<0.01	<0.02	<0.1	
WB1	Water	5/11/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	0.3	<0.00005	<0.001	<0.01	<0.01	0.2	
WB1	Water	3/12/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	<0.1	<0.00005	<0.001	<0.01	<0.01	0.1	
WB1	Water	13/01/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	0.2	<0.00005	<0.001	<0.01	<0.02	<0.1	
WB1	Water	11/02/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.01	<0.005	<0.00005	<0.002	<0.002	<0.002	<0.002	0.2	<0.00001	0.006	<0.02	<0.02	0.2
WB1	Water	4/03/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	0.2	<0.00005	<0.001	<0.01	<0.01	0.3	
WB1	Water	20/04/2021	</td																					

**Table L**  
**Surface Water QAQC Results (Rinsate, Field Blank and Trip-Blank): MTBE, BTEX and TRH**

## Definitions:

LOR 1° (Limit of Reporting, Primary Laboratory). --- denotes not tested.

#### **Notes:-**

All values in mg/l unless specified otherwise

Table uses colour coding for data interpretation, avoid black and white reproduction

denotes <1 QRB (primary laboratory).

denotes exceedance of acceptance criteria > LOR

**Table M**  
**Surface Water QAQC Results (Rinsate, Field Blank and Trip-Blank): OC/OP Pesticides**

**Definitions:**

LOR 1° (Limit of Reporting, Primary Laboratory), --- denotes not tested.

**Notes:**

All values in mg/L unless specified otherwise

Table uses colour coding for data interpretation, avoid black and white reproduction.

denotes <LOR (primary laboratory)

denotes exceedance of acceptance criteria > LOR

Sample ID	Sample type	Date	Trigger	Organochlorine Pesticides																				
				Aldrin	a-BHC	b-BHC	d-BHC	g-BHC (Lindane)		a-Chlordane	g-Chlordane	DDD	DDE	DDT	DDD + DDE + DDT	Dieldrin	a-Endosulfan	b-Endosulfan	Endosulfan sulphate	Endrin	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
<b>Rinsates</b>																								
WR1	Water	7/08/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WR1	Water	10/09/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WR1	Water	7/10/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WR1	Water	5/11/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WR1	Water	3/12/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WR1	Water	13/01/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WR1	Water	11/02/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WR1	Water	4/03/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WR1	Water	20/04/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WR1	Water	5/05/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WR1	Water	3/06/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WR1	Water	15/07/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WR1	Water	5/08/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
<b>Field Blank</b>																								
WB1	Water	7/08/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WB1	Water	10/09/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WB1	Water	7/10/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WB1	Water	5/11/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WB1	Water	3/12/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00002	
WB1	Water	13/01/2021		<0.00001	<0.00005	<0.00005	<																	

**Table N**  
**Surface Water QAQC Results (Rinsate, Field Blank and Trip-Blank): Per- and Poly-Fluoroalkyl Substances**

## Definitions:

LOR 1° (Limit of Reporting, Primary Laboratory), --- denotes not tested.

## Notes

All values in mg/L unless specified otherwise

Table uses colour coding for data interpretation, avoid black and white reproduction.

denotes <LOR (primary laboratory)

denotes exceedance of acceptance criteria > LOR

**FIGURE**





**Figure A**  
**Swan River crossing**  
**Water quality sampling locations**

Document Path: G:\Jobs\C\_Jobs\C20078 - MRWA SR Bridge\Figures C20078-004\C20078-004\_G\_001\_Fig A Proposed WQ Sampling\_200629.mxd

## **Appendix A**

### **DBCA Approval**

2020/1928  
PERMIT P12652

Pursuant to Part 4 (Regulation 29) of the Swan and Canning Rivers Management Regulations 2007, this is to certify that a permit is issued to the person(s) or organisation described hereunder as permit holder and that person(s) or organisation is permitted to carry out the authorised works, acts or activities for the duration specified, subject to the conditions listed below.

Permit holder: Main Roads Western Australia (John Braid)

Authorised works, acts or activities: Swan River Crossings Project – In-river scientific investigations – sampling suite includes contaminants, water quality, benthic habitat and sediment analysis

Location of works, acts or activities: Swan River between Fremantle Traffic Bridge and Stirling Bridge, Fremantle; and Lot 2010 on Plan 18598 and Lot 1941 on Plan 213981

Approval date: 2 October 2020

Expiry date: 31 December 2021

## CONDITIONS

1. The applicant shall notify the Department of Biodiversity, Conservation and Attractions in writing not less than three (3) days prior to the commencement of works (see **Advice Note 1**).
2. The applicant shall ensure that all contractors and personnel involved in the investigations approved by the Department of Biodiversity, Conservation and Attractions are familiar with the conditions and requirements of this approval at all times.
3. The works shall take place in accordance with the methodologies provided in the *Swan River Crossings Project-Environmental (in-river) Surveys September 2020 V6.0*, unless modified by a condition of this approval.
4. The results of the benthic habitat surveys, once collated, shall be provided to the Department of Biodiversity, Conservation and Attractions (see **Advice Note 1**).
5. Further to **Condition 4**, the applicant shall undertake any necessary additional sampling and/or modify the scientific investigation methodologies as required by the Department of Biodiversity, Conservation and Attractions on review of the results of the benthic habitat surveys and deduced potential impacts to known benthic habitat and communities.
6. The applicant shall ensure that all equipment is visually inspected for any traces of aquatic organisms and shall remove the organisms prior to the equipment entering the Swan Canning Development Control Area.
7. The applicant shall monitor all works and ensure that appropriate measures are implemented to contain turbidity and prevent sediment plumes spreading and shall have a silt curtain readily available to deploy in order to contain any turbidity and sediment plumes that are uncontrolled or move beyond the immediate area of works (see **Advice Note 2**).
8. Water-based activities shall cease if a dolphin comes within 50 metres of any water vessel involved in the approved activities and shall not recommence until any dolphin has moved away more than 200 metres or has not been observed for 20 minutes.
9. Any refuelling shall take place outside of the Swan Canning Development Control Area or at a licensed refuelling facility.

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10. A spill kit shall be maintained on all vessels and shall be utilised to contain and clean up any spills that occur.
11. The applicant shall take all precautions to ensure no damage to the foreshore, riverbank or waterway (including infrastructure and vegetation) occurs as a result of the works. Should any inadvertent damage occur, the applicant is required to notify the Department of Biodiversity, Conservation and Attractions within 48 hours of that damage occurring (see **Advice Note 2**).
12. The applicant shall rectify at its expense any damage to the foreshore, riverbank or waterway (including infrastructure and vegetation) that occurs as a result of the works.
13. Within 24 hours of the completion of the activities, the applicant shall remove all waste materials, equipment and machinery.
14. An electronic copy of the report, addressing the findings of the scientific investigations approved under this permit shall be forwarded to the Department of Biodiversity, Conservation and Attractions prior to the expiration of this permit (see **Advice Note 1**).

**ADVICE TO APPLICANT**

1. Notifications and information can be emailed to [rivers.planning@dbca.wa.gov.au](mailto:rivers.planning@dbca.wa.gov.au).
2. In the event of spills, waste materials impacting the river or turbidity or sediment plumes, the Department of Biodiversity, Conservation and Attractions' Duty Officer (Riverpark) can be contacted on 9278 0981 (24 hrs) or Pollution Response Officer (Marine) on 9480 9924 (24 hrs).
3. The Department of Transport (DoT) Navigational Safety advises the applicant that:
  - Main Roads Western Australia (MRWA) and/or its contractors are to develop a communication plan with Commercial Ferry Operators and are to consult with commercial operators to gain comment and support for the Vessel Management Plan [Regarding 4.2 Legislative and Other Provisions (page 13 of the Vessel Management Plan): Should also include the '*Western Australian Marine Act 1982*' and the '*Marine Safety (Domestic Commercial Vessel) National Law Act 2012*'];
  - MRWA and/or its contractors are to monitor VHF Channel 16 during operating hours;
  - The works area and any hazards should be marked with yellow special marker buoys, approximately 1 metre in height equipped with flashing yellow lights;
  - All vessels taking part in the works must display shapes and lights in accordance with the Prevention of Collisions at Sea Regulations 1983 at all times;
  - Should diving operations be conducted between the Fremantle Rail Bridge and Fremantle Traffic Bridge, a closure of the respective navigation span will be required;
  - Navigational channels are to remain open wherever possible and only one navigation span is to be impeded at any one time;
  - Any anchor points which encroach the channel should be marked;
  - A Temporary Notice to Mariners (TNTM) must be issued by DoT outlining the scope of the works, the works area, navigational marking (lighting) and dates of the works, prior to commencement. MRWA and/or its contractors are to provide notification of the works to DoT a minimum of 21 days prior to the works commencing to enable a TNTM to be published, by email to: [navigational.safety@transport.wa.gov.au](mailto:navigational.safety@transport.wa.gov.au);
  - MRWA and/or its contractors are to provide sufficient notification of any ad hoc day closures of navigational channels so that a TNTM can be published to alert mariners; and



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- MRWA and/or its contractors are to seek approval from Fremantle Ports Authority for any works to the west of the Fremantle Traffic and Rail Bridges.
4. The applicant is advised that the proposed works are located in a high to moderate and moderate to low acid sulphate soils risk area. The Acid Sulfate Soils Guideline Series for guidance on the identification, assessment and management of acid sulphate soils in Western Australia is available from the Department of Water and Environmental Regulation website at [www.dwer.wa.gov.au](http://www.dwer.wa.gov.au). If any acid sulfate soils are exposed during the works the Department of Water and Environmental Regulation should be contacted for further advice.
5. The applicant is advised that this approval does not negate the need to obtain any other approval from relevant agencies, or from the Department of Biodiversity, Conservation and Attractions.

**PERMIT APPROVED**

Signed:  Date: 02/10/20

Jacey Mills  
Manager, Statutory Assessments  
As delegate of CEO  
Under Section 38 of the SCRM Act 2006

## **Appendix B**

### **Laboratory reports**

## CERTIFICATE OF ANALYSIS 266547

### **Client Details**

<b>Client</b>	RPS Australia West Pty Ltd
<b>Attention</b>	Matthew Emeny
<b>Address</b>	Level 2, 27-31 Troode St, WEST PERTH, WA, 6005

### **Sample Details**

<b>Your Reference</b>	<b><u>EEC200092.002 - Fremantle Port</u></b>
<b>Number of Samples</b>	13 Water
<b>Date samples received</b>	05/08/2021
<b>Date completed instructions received</b>	05/08/2021

### **Analysis Details**

Please refer to the following pages for results, methodology summary and quality control data.  
 Samples were analysed as received from the client. Results relate specifically to the samples as received.  
 Results are reported on a dry weight basis for solids and on an as received basis for other matrices.  
**Please refer to the last page of this report for any comments relating to the results.**

### **Report Details**

<b>Date results requested by</b>	20/08/2021
<b>Date of Issue</b>	20/08/2021
<b>Reissue Details</b>	This report replaces R00 created on 20/08/2021 due to: Correction in Sample ID - 266547-6 and 7
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. <b>Tests not covered by NATA are denoted with *</b>	

### Results Approved By

Lien Tang, Assistant Operations Manager  
 Michael Mowle, Metals/Inorganics Supervisor  
 Travis Carey, Organics - Team Leader

### Authorised By



Michael Kubiak, Laboratory Manager

**Client Reference: EEC200092.002 - Fremantle Port**

Miscellaneous Inorganics							
Our Reference	UNITS	PQL	266547-1	266547-2	266547-3	266547-4	266547-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021
Date analysed	-		06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021
Total Dissolved Solids (grav)	mg/L	5	8,700	8,500	5,800	8,100	8,000
Total Suspended Solids	mg/L	5	49	21	16	15	18
Turbidity	NTU	0.1	8.7	7.7	9.5	8.1	9.2
Dissolved Organic Carbon	mg/L	1	15	16	18	17	15
Acidity as CaCO <sub>3</sub>	mg/L	5	<5	<5	<5	<5	<5
Sulphide in water*	mg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoride	mg/L	0.1	0.3	0.3	0.3	0.3	0.3

Miscellaneous Inorganics							
Our Reference	UNITS	PQL	266547-6	266547-7	266547-8	266547-9	266547-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021
Date analysed	-		06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021
Total Dissolved Solids (grav)	mg/L	5	23,000	35,000	5,600	21,000	7,500
Total Suspended Solids	mg/L	5	22	35	11	24	22
Turbidity	NTU	0.1	3.9	1.4	8.6	4.5	12
Dissolved Organic Carbon	mg/L	1	10	2	18	10	15
Acidity as CaCO <sub>3</sub>	mg/L	5	7	8	<5	7	<5
Sulphide in water*	mg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoride	mg/L	0.1	0.6	0.8	0.3	0.6	0.3

Miscellaneous Inorganics				
Our Reference	UNITS	PQL	266547-11	266547-12
Your Reference			WB1	WR1
Date Sampled			05/08/2021	05/08/2021
Type of sample			Water	Water
Date prepared	-		06/08/2021	06/08/2021
Date analysed	-		06/08/2021	06/08/2021
Turbidity	NTU	0.1	0.6	0.4

**Client Reference: EEC200092.002 - Fremantle Port**

Ionic Balance							
Our Reference	UNITS	PQL	266547-1	266547-2	266547-3	266547-4	266547-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021
Date analysed	-		10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021
Calcium - Dissolved	mg/L	0.5	94	98	71	94	87
Potassium - Dissolved	mg/L	0.5	58	60	38	58	52
Magnesium - Dissolved	mg/L	0.5	250	260	170	250	220
Sodium - Dissolved	mg/L	0.5	2,100	2,200	1,300	2,100	1,700
Bicarbonate HCO <sub>3</sub> as CaCO <sub>3</sub>	mg/L	5	90	90	88	90	90
Carbonate CO <sub>3</sub> <sup>2-</sup> as CaCO <sub>3</sub>	mg/L	5	<5	<5	<5	<5	<5
Hydroxide OH <sup>-</sup> as CaCO <sub>3</sub>	mg/L	5	<5	<5	<5	<5	<5
Total Alkalinity as CaCO <sub>3</sub>	mg/L	5	90	90	88	90	90
Chloride	mg/L	1	4,100	4,100	2,900	4,100	3,800
Sulphate	mg/L	1	550	550	350	540	500
Ionic Balance	%		-4.0	-2.1	-8.6	-4.7	-9.2
Hardness as CaCO <sub>3</sub>	mg/L	3	1,300	1,300	900	1,300	1,100

Ionic Balance							
Our Reference	UNITS	PQL	266547-6	266547-7	266547-8	266547-9	266547-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		10/08/2021	18/08/2021	10/08/2021	10/08/2021	10/08/2021
Date analysed	-		10/08/2021	18/08/2021	10/08/2021	10/08/2021	10/08/2021
Calcium - Dissolved	mg/L	0.5	180	330	70	170	85
Potassium - Dissolved	mg/L	0.5	140	320	33	140	51
Magnesium - Dissolved	mg/L	0.5	550	1,100	170	520	220
Sodium - Dissolved	mg/L	0.5	5,000	7,400	1,100	4,700	1,600
Bicarbonate HCO <sub>3</sub> as CaCO <sub>3</sub>	mg/L	5	110	120	86	110	92
Carbonate CO <sub>3</sub> <sup>2-</sup> as CaCO <sub>3</sub>	mg/L	5	<5	<5	<5	<5	<5
Hydroxide OH <sup>-</sup> as CaCO <sub>3</sub>	mg/L	5	<5	<5	<5	<5	<5
Total Alkalinity as CaCO <sub>3</sub>	mg/L	5	110	120	86	110	92
Chloride	mg/L	1	12,000	19,000	2,600	12,000	3,700
Sulphate	mg/L	1	1,800	2,800	300	1,600	490
Ionic Balance	%		-15	-15	-9.1	-17	-12
Hardness as CaCO <sub>3</sub>	mg/L	3	2,700	5,200	850	2,600	1,100

Nutrients in Water							
Our Reference	UNITS	PQL	266547-1	266547-2	266547-3	266547-4	266547-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021
Date analysed	-		06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021
Total Nitrogen	mg/L	0.1	1.6	1.6	1.7	1.6	1.6
NOx as N	mg/L	0.005	0.56	0.57	0.62	0.61	0.57
Ammonia as N	mg/L	0.005	0.095	0.10	0.11	0.11	0.095
Total Phosphorus	mg/L	0.01	0.06	0.06	0.07	0.07	0.07
Phosphate as P	mg/L	0.005	0.036	0.041	0.043	0.041	0.040

Nutrients in Water							
Our Reference	UNITS	PQL	266547-6	266547-7	266547-8	266547-9	266547-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021
Date analysed	-		06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021
Total Nitrogen	mg/L	0.1	0.9	0.3	1.7	0.9	1.6
NOx as N	mg/L	0.005	0.28	0.044	0.67	0.30	0.60
Ammonia as N	mg/L	0.005	0.064	0.031	0.098	0.074	0.088
Total Phosphorus	mg/L	0.01	0.04	0.02	0.13	0.04	0.08
Phosphate as P	mg/L	0.005	0.023	0.008	0.042	0.025	0.039

Total Metals in water							
Our Reference	UNITS	PQL	266547-1	266547-2	266547-3	266547-4	266547-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date digested	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Date analysed	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Aluminium-Total	mg/L	0.01	0.38	0.16	0.17	0.21	0.20
Iron-Total	mg/L	0.01	0.83	0.48	0.53	0.55	0.56

Total Metals in water							
Our Reference	UNITS	PQL	266547-6	266547-7	266547-8	266547-9	266547-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date digested	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Date analysed	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Aluminium-Total	mg/L	0.01	0.11	0.03	0.15	0.09	0.21
Iron-Total	mg/L	0.01	0.31	0.05	0.50	0.30	0.59

Total Metals in water				
Our Reference	UNITS	PQL	266547-11	266547-12
Your Reference			WB1	WR1
Date Sampled			05/08/2021	05/08/2021
Type of sample			Water	Water
Date digested	-		11/08/2021	11/08/2021
Date analysed	-		11/08/2021	11/08/2021
Aluminium-Total	mg/L	0.01	<0.01	<0.01
Iron-Total	mg/L	0.01	<0.01	<0.01

**Client Reference: EEC200092.002 - Fremantle Port**

Dissolved Metals in Water							
Our Reference	UNITS	PQL	266547-1	266547-2	266547-3	266547-4	266547-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Date analysed	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Silver-Dissolved Ultra Low	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Aluminium-Dissolved	mg/L	0.01	0.06	0.05	0.06	0.05	0.08
Arsenic-Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium-Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt-Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium-Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper-Dissolved	mg/L	0.001	0.003	0.002	0.002	0.002	0.003
Iron-Dissolved	mg/L	0.01	0.24	0.25	0.28	0.26	0.26
Mercury-Dissolved	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Manganese-Dissolved	mg/L	0.005	0.031	0.032	0.035	0.033	0.026
Molybdenum-Dissolved	mg/L	0.001	0.003	0.003	0.002	0.003	0.003
Nickel-Dissolved	mg/L	0.001	0.001	0.001	0.001	0.001	0.002
Lead-Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.001
Antimony-Dissolved	mg/L	0.001	<0.001	<0.001	0.001	<0.001	<0.001
Selenium-Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc-Dissolved	mg/L	0.001	0.004	0.003	0.005	0.008	0.012
Silicon - Dissolved	mg/L	0.1	3.3	3.6	3.8	3.6	3.7

**Client Reference: EEC200092.002 - Fremantle Port**

Dissolved Metals in Water							
Our Reference	UNITS	PQL	266547-6	266547-7	266547-8	266547-9	266547-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Date analysed	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Silver-Dissolved Ultra Low	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Aluminium-Dissolved	mg/L	0.01	0.03	<0.01	0.07	0.03	0.09
Arsenic-Dissolved	mg/L	0.001	<0.001	0.002	<0.001	0.001	<0.001
Cadmium-Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt-Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium-Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper-Dissolved	mg/L	0.001	<0.001	<0.001	0.002	<0.001	0.002
Iron-Dissolved	mg/L	0.01	0.16	0.03	0.29	0.17	0.28
Mercury-Dissolved	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Manganese-Dissolved	mg/L	0.005	0.022	0.008	0.035	0.028	0.025
Molybdenum-Dissolved	mg/L	0.001	0.005	0.011	0.002	0.005	0.003
Nickel-Dissolved	mg/L	0.001	<0.001	<0.001	0.001	<0.001	0.002
Lead-Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.001
Antimony-Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium-Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc-Dissolved	mg/L	0.001	0.001	<0.001	0.007	<0.001	0.014
Silicon - Dissolved	mg/L	0.1	2.7	<1	3.9	2.7	3.5

<b>Dissolved Metals in Water</b>				
Our Reference	UNITS	PQL	266547-11	266547-12
Your Reference			WB1	WR1
Date Sampled			05/08/2021	05/08/2021
Type of sample			Water	Water
Date prepared	-		11/08/2021	11/08/2021
Date analysed	-		11/08/2021	11/08/2021
Silver-Dissolved Ultra Low	mg/L	0.00005	<0.00005	<0.00005
Aluminium-Dissolved	mg/L	0.01	<0.01	<0.01
Arsenic-Dissolved	mg/L	0.001	<0.001	<0.001
Cadmium-Dissolved	mg/L	0.0001	<0.0001	<0.0001
Cobalt-Dissolved	mg/L	0.001	<0.001	<0.001
Chromium-Dissolved	mg/L	0.001	<0.001	<0.001
Copper-Dissolved	mg/L	0.001	<0.001	<0.001
Iron-Dissolved	mg/L	0.01	<0.01	<0.01
Mercury-Dissolved	mg/L	0.00005	<0.00005	<0.00005
Manganese-Dissolved	mg/L	0.005	<0.005	<0.005
Molybdenum-Dissolved	mg/L	0.001	<0.001	<0.001
Nickel-Dissolved	mg/L	0.001	<0.001	<0.001
Lead-Dissolved	mg/L	0.001	<0.001	<0.001
Antimony-Dissolved	mg/L	0.001	<0.001	<0.001
Selenium-Dissolved	mg/L	0.001	<0.001	<0.001
Zinc-Dissolved	mg/L	0.001	<0.001	<0.001
Silicon - Dissolved	mg/L	0.1	<0.1	<0.1

vTRH(C6-C10)/MBTEXN in water							
Our Reference	UNITS	PQL	266547-1	266547-2	266547-3	266547-4	266547-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date analysed	-		06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021
TRH C <sub>6</sub> - C <sub>9</sub>	µg/L	10	<50	<50	<50	<50	<10
TRH C <sub>6</sub> - C <sub>10</sub>	µg/L	10	<50	<50	<50	<50	<10
TRH C <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	µg/L	10	<50	<50	<50	<50	<10
MTBE	µg/L	1	<3	<3	<3	<3	<1
Benzene	µg/L	1	<3	<3	<3	<3	<1
Toluene	µg/L	1	<3	<3	<3	<3	<1
Ethylbenzene	µg/L	1	<3	<3	<3	<3	<1
m+p-xylene	µg/L	2	<6	<6	<6	<6	<2
o-xylene	µg/L	1	<3	<3	<3	<3	<1
Naphthalene	µg/L	1	<3	<3	<3	<3	<1
Surrogate Dibromofluoromethane	%		97	97	99	100	99
Surrogate toluene-d8	%		90	88	90	88	88
Surrogate 4-BFB	%		101	101	100	103	101

vTRH(C6-C10)/MBTEXN in water							
Our Reference	UNITS	PQL	266547-6	266547-7	266547-8	266547-9	266547-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date analysed	-		06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021
TRH C <sub>6</sub> - C <sub>9</sub>	µg/L	10	<10	<10	<50	<50	<50
TRH C <sub>6</sub> - C <sub>10</sub>	µg/L	10	<10	<10	<50	<50	<50
TRH C <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	µg/L	10	<10	<10	<50	<50	<50
MTBE	µg/L	1	<1	<1	<3	<3	<3
Benzene	µg/L	1	<1	<1	<3	<3	<3
Toluene	µg/L	1	<1	<1	<3	<3	<3
Ethylbenzene	µg/L	1	<1	<1	<3	<3	<3
m+p-xylene	µg/L	2	<2	<2	<6	<6	<6
o-xylene	µg/L	1	<1	<1	<3	<3	<3
Naphthalene	µg/L	1	<1	<1	<3	<3	<3
Surrogate Dibromofluoromethane	%		100	99	100	99	97
Surrogate toluene-d8	%		89	89	89	88	88
Surrogate 4-BFB	%		102	102	102	99	101

vTRH(C6-C10)/MBTEXN in water					
Our Reference	UNITS	PQL	266547-11	266547-12	266547-13
Your Reference			WB1	WR1	WTB1
Date Sampled			05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water
Date analysed	-		06/08/2021	06/08/2021	06/08/2021
TRH C <sub>6</sub> - C <sub>9</sub>	µg/L	10	<10	<10	<10
TRH C <sub>6</sub> - C <sub>10</sub>	µg/L	10	<10	<10	<10
TRH C <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	µg/L	10	<10	<10	<10
MTBE	µg/L	1	<1	<1	<1
Benzene	µg/L	1	<1	<1	<1
Toluene	µg/L	1	<1	<1	<1
Ethylbenzene	µg/L	1	<1	<1	<1
m+p-xylene	µg/L	2	<2	<2	<2
o-xylene	µg/L	1	<1	<1	<1
Naphthalene	µg/L	1	<1	<1	<1
Surrogate Dibromofluoromethane	%		99	98	97
Surrogate toluene-d8	%		88	89	88
Surrogate 4-BFB	%		101	100	101

svTRH(C10-C40) in water							
Our Reference	UNITS	PQL	266547-1	266547-2	266547-3	266547-4	266547-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date extracted	-		10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021
Date analysed	-		10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021
TRH C <sub>10</sub> - C <sub>14</sub>	µg/L	50	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	µg/L	100	<100	<100	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	µg/L	100	<100	<100	<100	<100	<100
TRH >C <sub>10</sub> - C <sub>16</sub>	µg/L	50	<50	<50	<50	<50	<50
TRH >C <sub>10</sub> -C <sub>16</sub> less N (F2)	µg/L	50	<50	<50	<50	<50	<50
TRH >C <sub>16</sub> - C <sub>34</sub>	µg/L	100	<100	<100	<100	<100	<100
TRH >C <sub>34</sub> - C <sub>40</sub>	µg/L	100	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%		94	98	101	103	84

svTRH(C10-C40) in water							
Our Reference	UNITS	PQL	266547-6	266547-7	266547-8	266547-9	266547-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date extracted	-		10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021
Date analysed	-		10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021
TRH C <sub>10</sub> - C <sub>14</sub>	µg/L	50	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	µg/L	100	<100	<100	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	µg/L	100	<100	<100	<100	<100	<100
TRH >C <sub>10</sub> - C <sub>16</sub>	µg/L	50	<50	<50	<50	<50	<50
TRH >C <sub>10</sub> -C <sub>16</sub> less N (F2)	µg/L	50	<50	<50	<50	<50	<50
TRH >C <sub>16</sub> - C <sub>34</sub>	µg/L	100	<100	<100	<100	<100	<100
TRH >C <sub>34</sub> - C <sub>40</sub>	µg/L	100	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%		95	106	95	107	104

svTRH(C10-C40) in water				
Our Reference	UNITS	PQL	266547-11	266547-12
Your Reference			WB1	WR1
Date Sampled			05/08/2021	05/08/2021
Type of sample			Water	Water
Date extracted	-		10/08/2021	10/08/2021
Date analysed	-		10/08/2021	10/08/2021
TRH C <sub>10</sub> - C <sub>14</sub>	µg/L	50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	µg/L	100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	µg/L	100	<100	<100
TRH >C <sub>10</sub> - C <sub>16</sub>	µg/L	50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less N (F2)	µg/L	50	<50	<50
TRH >C <sub>16</sub> - C <sub>34</sub>	µg/L	100	<100	<100
TRH >C <sub>34</sub> - C <sub>40</sub>	µg/L	100	<100	<100
Surrogate o-Terphenyl	%		101	105

PAHs in Water							
Our Reference	UNITS	PQL	266547-1	266547-2	266547-3	266547-4	266547-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date extracted	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Date analysed	-		17/08/2021	17/08/2021	17/08/2021	17/08/2021	17/08/2021
Naphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-D <sub>14</sub>	%		96	86	88	99	90

**Client Reference: EEC200092.002 - Fremantle Port**

PAHs in Water							
Our Reference	UNITS	PQL	266547-6	266547-7	266547-8	266547-9	266547-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date extracted	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Date analysed	-		17/08/2021	17/08/2021	17/08/2021	17/08/2021	17/08/2021
Naphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-D <sub>14</sub>	%		123	106	95	95	93

PAHs in Water				
Our Reference	UNITS	PQL	266547-11	266547-12
Your Reference			WB1	WR1
Date Sampled			05/08/2021	05/08/2021
Type of sample			Water	Water
Date extracted	-		11/08/2021	11/08/2021
Date analysed	-		17/08/2021	17/08/2021
Naphthalene	µg/L	0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<0.1	<0.1
Dibeno(a,h)anthracene	µg/L	0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	0.5	<0.5	<0.5
Total +ve PAH's	µg/L	0.1	<0.1	<0.1
Surrogate p-Terphenyl-D <sub>14</sub>	%		109	94

**Client Reference: EEC200092.002 - Fremantle Port**

Low Level OCP in water							
Our Reference	UNITS	PQL	266547-1	266547-2	266547-3	266547-4	266547-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date extracted	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Date analysed	-		17/08/2021	17/08/2021	17/08/2021	17/08/2021	17/08/2021
Hexachlorobenzene (HCB)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
a-BHC	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lindane (g-BHC)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
b-BHC	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
d-BHC	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor Epoxide	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
g-Chlordane	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
a-Chlordane	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
a-Endosulfan	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
pp-DDE	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pp-DDD	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
b-Endosulfan	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
pp-DDT	µg/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Endosulfan Sulphate	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Methoxychlor	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Surrogate 2-chlorophenol-d4	%		116	103	107	115	111

**Client Reference: EEC200092.002 - Fremantle Port**

Low Level OCP in water							
Our Reference	UNITS	PQL	266547-6	266547-7	266547-8	266547-9	266547-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date extracted	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Date analysed	-		17/08/2021	17/08/2021	17/08/2021	17/08/2021	17/08/2021
Hexachlorobenzene (HCB)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
a-BHC	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lindane (g-BHC)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
b-BHC	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
d-BHC	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor Epoxide	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
g-Chlordane	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
a-Chlordane	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
a-Endosulfan	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
pp-DDE	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pp-DDD	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
b-Endosulfan	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
pp-DDT	µg/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Endosulfan Sulphate	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Methoxychlor	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Surrogate 2-chlorophenol-d4	%		137	120	116	107	114

Low Level OCP in water				
Our Reference	UNITS	PQL	266547-11	266547-12
Your Reference			WB1	WR1
Date Sampled			05/08/2021	05/08/2021
Type of sample			Water	Water
Date extracted	-		11/08/2021	11/08/2021
Date analysed	-		17/08/2021	17/08/2021
Hexachlorobenzene (HCB)	µg/L	0.01	<0.01	<0.01
a-BHC	µg/L	0.05	<0.05	<0.05
Lindane (g-BHC)	µg/L	0.05	<0.05	<0.05
b-BHC	µg/L	0.05	<0.05	<0.05
Heptachlor	µg/L	0.01	<0.01	<0.01
d-BHC	µg/L	0.05	<0.05	<0.05
Aldrin	µg/L	0.01	<0.01	<0.01
Heptachlor Epoxide	µg/L	0.01	<0.01	<0.01
g-Chlordane	µg/L	0.01	<0.01	<0.01
a-Chlordane	µg/L	0.01	<0.01	<0.01
a-Endosulfan	µg/L	0.02	<0.02	<0.02
pp-DDE	µg/L	0.01	<0.01	<0.01
Dieldrin	µg/L	0.01	<0.01	<0.01
Endrin	µg/L	0.01	<0.01	<0.01
pp-DDD	µg/L	0.01	<0.01	<0.01
b-Endosulfan	µg/L	0.02	<0.02	<0.02
pp-DDT	µg/L	0.006	<0.006	<0.006
Endosulfan Sulphate	µg/L	0.02	<0.02	<0.02
Methoxychlor	µg/L	0.02	<0.02	<0.02
Surrogate 2-chlorophenol-d4	%		108	95

PFAS in Water TRACE Extended							
Our Reference	UNITS	PQL	266547-1	266547-2	266547-3	266547-4	266547-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		17/08/2021	17/08/2021	17/08/2021	17/08/2021	17/08/2021
Date analysed	-		17/08/2021	17/08/2021	17/08/2021	17/08/2021	17/08/2021
Perfluorobutanesulfonic acid	µg/L	0.0004	0.0008	0.0009	0.001	0.0009	0.002
Perfluoropentanesulfonic acid	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.002
Perfluorohexamersulfonic acid	µg/L	0.0002	0.0032	0.0036	0.0039	0.0036	0.015
Perfluoroheptanesulfonic acid	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.001
Perfluorooctanesulfonate PFOS	µg/L	0.0002	0.0064	0.0055	0.0059	0.0053	0.038
Perfluorodecanesulfonic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorobutanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoropentanoic acid	µg/L	0.002	<0.002	0.003	0.003	0.003	0.003
Perfluorohexanoic acid	µg/L	0.0004	0.001	0.002	0.002	0.002	0.0046
Perfluorohexanoic acid	µg/L	0.0004	0.0004	0.0005	<0.0004	0.0006	0.001
Perfluorooctanoic acid PFOA	µg/L	0.0002	0.001	0.001	0.001	0.001	0.0022
Perfluorononanoic acid	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorodecanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoroundecanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid	µg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Perfluorotridecanoic acid	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorotetradecanoic acid	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 FTS	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
6:2 FTS	µg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
8:2 FTS	µg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
10:2 FTS	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorooctane sulfonamide	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-Methyl perfluorooctane sulfonamide	µg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctanesulfon -amide	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-Me perfluorooctanesulfonamid -oethanol	µg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-Et perfluorooctanesulfonamid -oethanol	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Surrogate <sup>13</sup> C <sub>8</sub> PFOS	%		99	96	98	86	92
Surrogate <sup>13</sup> C <sub>2</sub> PFOA	%		93	91	85	96	86
Extracted ISTD <sup>13</sup> C <sub>3</sub> PFBS	%		87	91	91	98	99
Extracted ISTD <sup>18</sup> O <sub>2</sub> PFHxS	%		99	102	97	103	111
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOS	%		96	102	102	112	108
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFBA	%		#	#	#	#	#

PFAS in Water TRACE Extended							
Our Reference	UNITS	PQL	266547-1	266547-2	266547-3	266547-4	266547-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Extracted ISTD <sup>13</sup> C <sub>3</sub> PFPeA	%		35	34	30	33	33
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFHxA	%		56	56	55	61	59
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFHpA	%		73	79	75	86	86
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOA	%		96	101	100	97	108
Extracted ISTD <sup>13</sup> C <sub>5</sub> PFNA	%		100	99	94	98	106
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFDA	%		108	118	115	113	123
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFUnDA	%		112	126	128	124	137
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFDoDA	%		96	100	92	95	109
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFTeDA	%		130	122	109	121	137
Extracted ISTD <sup>13</sup> C <sub>2</sub> 4:2FTS	%		118	118	121	116	123
Extracted ISTD <sup>13</sup> C <sub>2</sub> 6:2FTS	%		132	131	137	140	148
Extracted ISTD <sup>13</sup> C <sub>2</sub> 8:2FTS	%		154	154	164	158	169
Extracted ISTD <sup>13</sup> C <sub>8</sub> FOSA	%		62	63	69	66	72
Extracted ISTD d <sub>3</sub> N MeFOSA	%		29	32	53	47	37
Extracted ISTD d <sub>5</sub> N EtFOSA	%		28	35	54	46	38
Extracted ISTD d <sub>7</sub> N MeFOSE	%		66	65	80	73	87
Extracted ISTD d <sub>9</sub> N EtFOSE	%		71	69	82	80	87
Extracted ISTD d <sub>3</sub> N MeFOSAA	%		86	89	98	94	101
Extracted ISTD d <sub>5</sub> N EtFOSAA	%		109	103	105	107	118
Total Positive PFHxS & PFOS	µg/L	0.0002	0.0096	0.0091	0.0098	0.0089	0.053
Total Positive PFOS & PFOA	µg/L	0.0002	0.0074	0.0065	0.0069	0.0063	0.040
Total Positive PFAS	µg/L	0.0002	0.013	0.016	0.017	0.016	0.069

PFAS in Water TRACE Extended							
Our Reference	UNITS	PQL	266547-6	266547-7	266547-8	266547-9	266547-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		17/08/2021	17/08/2021	17/08/2021	17/08/2021	17/08/2021
Date analysed	-		17/08/2021	17/08/2021	17/08/2021	17/08/2021	17/08/2021
Perfluorobutanesulfonic acid	µg/L	0.0004	0.0006	<0.0004	0.001	0.0006	0.002
Perfluoropentanesulfonic acid	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.002
Perfluorohexanesulfonic acid	µg/L	0.0002	0.0020	0.0005	0.0038	0.0021	0.017
Perfluoroheptanesulfonic acid	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.002
Perfluorooctanesulfonate PFOS	µg/L	0.0002	0.0033	0.0008	0.0057	0.0031	0.046
Perfluorodecanesulfonic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorobutanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoropentanoic acid	µg/L	0.002	<0.002	<0.002	0.003	<0.002	0.004
Perfluorohexanoic acid	µg/L	0.0004	0.001	<0.0004	0.002	0.001	0.0047
Perfluoroheptanoic acid	µg/L	0.0004	<0.0004	<0.0004	0.0005	<0.0004	0.001
Perfluorooctanoic acid PFOA	µg/L	0.0002	0.0009	0.0003	0.001	0.0006	0.0020
Perfluorononanoic acid	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorodecanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoroundecanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid	µg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Perfluorotridecanoic acid	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorotetradecanoic acid	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 FTS	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
6:2 FTS	µg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
8:2 FTS	µg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
10:2 FTS	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorooctane sulfonamide	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-Methyl perfluorooctane sulfonamide	µg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctanesulfon -amide	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-Me perfluorooctanesulfonamid -oethanol	µg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-Et perfluorooctanesulfonamid -oethanol	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Surrogate <sup>13</sup> C <sub>8</sub> PFOS	%		107	99	96	96	91
Surrogate <sup>13</sup> C <sub>2</sub> PFOA	%		89	90	92	90	90
Extracted ISTD <sup>13</sup> C <sub>3</sub> PFBS	%		43	96	92	96	98
Extracted ISTD <sup>18</sup> O <sub>2</sub> PFHxS	%		49	95	108	105	110
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOS	%		48	93	110	105	109
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFBA	%		#	46	#	#	#

PFAS in Water TRACE Extended							
Our Reference	UNITS	PQL	266547-6	266547-7	266547-8	266547-9	266547-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Extracted ISTD <sup>13</sup> C <sub>3</sub> PFPeA	%		25	71	30	44	28
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFHxA	%		40	96	56	69	57
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFHpA	%		51	115	80	95	82
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOA	%		57	119	99	114	107
Extracted ISTD <sup>13</sup> C <sub>5</sub> PFNA	%		56	112	100	113	101
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFDA	%		63	119	114	113	118
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFUnDA	%		84	129	122	122	133
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFDoDA	%		73	109	97	100	105
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFTeDA	%		104	141	128	126	131
Extracted ISTD <sup>13</sup> C <sub>2</sub> 4:2FTS	%		47	91	119	108	114
Extracted ISTD <sup>13</sup> C <sub>2</sub> 6:2FTS	%		63	103	144	124	150
Extracted ISTD <sup>13</sup> C <sub>2</sub> 8:2FTS	%		75	108	171	143	187
Extracted ISTD <sup>13</sup> C <sub>8</sub> FOSA	%		46	63	65	68	67
Extracted ISTD d <sub>3</sub> N MeFOSA	%		34	#	31	33	30
Extracted ISTD d <sub>5</sub> N EtFOSA	%		36	#	33	31	32
Extracted ISTD d <sub>7</sub> N MeFOSE	%		63	59	70	69	73
Extracted ISTD d <sub>9</sub> N EtFOSE	%		71	63	72	74	80
Extracted ISTD d <sub>3</sub> N MeFOSAA	%		63	89	95	90	106
Extracted ISTD d <sub>5</sub> N EtFOSAA	%		82	115	107	110	121
Total Positive PFHxS & PFOS	µg/L	0.0002	0.0053	0.001	0.0095	0.0052	0.063
Total Positive PFOS & PFOA	µg/L	0.0002	0.0042	0.001	0.0067	0.0037	0.048
Total Positive PFAS	µg/L	0.0002	0.0078	0.002	0.017	0.0074	0.081

PFAS in Water TRACE Extended					
Our Reference	UNITS	PQL	266547-11	266547-12	266547-13
Your Reference			WB1	WR1	WTB1
Date Sampled			05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water
Date prepared	-		17/08/2021	17/08/2021	17/08/2021
Date analysed	-		17/08/2021	17/08/2021	17/08/2021
Perfluorobutanesulfonic acid	µg/L	0.0004	<0.0004	<0.0004	<0.0004
Perfluoropentanesulfonic acid	µg/L	0.001	<0.001	<0.001	<0.001
Perfluorohexanesulfonic acid	µg/L	0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanesulfonic acid	µg/L	0.001	<0.001	<0.001	<0.001
Perfluorooctanesulfonate PFOS	µg/L	0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanesulfonic acid	µg/L	0.002	<0.002	<0.002	<0.002
Perfluorobutanoic acid	µg/L	0.002	<0.002	<0.002	<0.002
Perfluoropentanoic acid	µg/L	0.002	<0.002	<0.002	<0.002
Perfluorohexanoic acid	µg/L	0.0004	<0.0004	<0.0004	<0.0004
Perfluoroheptanoic acid	µg/L	0.0004	<0.0004	<0.0004	<0.0004
Perfluorooctanoic acid PFOA	µg/L	0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid	µg/L	0.001	<0.001	<0.001	<0.001
Perfluorodecanoic acid	µg/L	0.002	<0.002	<0.002	<0.002
Perfluoroundecanoic acid	µg/L	0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid	µg/L	0.005	<0.005	<0.005	<0.005
Perfluorotridecanoic acid	µg/L	0.01	<0.01	<0.01	<0.01
Perfluorotetradecanoic acid	µg/L	0.05	<0.05	<0.05	<0.05
4:2 FTS	µg/L	0.001	<0.001	<0.001	<0.001
6:2 FTS	µg/L	0.0004	<0.0004	<0.0004	<0.0004
8:2 FTS	µg/L	0.0004	<0.0004	<0.0004	<0.0004
10:2 FTS	µg/L	0.002	<0.002	<0.002	<0.002
Perfluorooctane sulfonamide	µg/L	0.01	<0.01	<0.01	<0.01
N-Methyl perfluorooctane sulfonamide	µg/L	0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctanesulfon -amide	µg/L	0.01	<0.01	<0.01	<0.01
N-Me perfluorooctanesulfonamid -oethanol	µg/L	0.005	<0.005	<0.005	<0.005
N-Et perfluorooctanesulfonamid -oethanol	µg/L	0.05	<0.05	<0.05	<0.05
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.002	<0.002	<0.002	<0.002
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.002	<0.002	<0.002	<0.002
Surrogate <sup>13</sup> C <sub>8</sub> PFOS	%		103	96	91
Surrogate <sup>13</sup> C <sub>2</sub> PFOA	%		86	95	91
Extracted ISTD <sup>13</sup> C <sub>3</sub> PFBS	%		100	103	99
Extracted ISTD <sup>18</sup> O <sub>2</sub> PFHxS	%		97	103	102
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOS	%		101	106	104
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFBA	%		128	137	129

PFAS in Water TRACE Extended					
Our Reference	UNITS	PQL	266547-11	266547-12	266547-13
Your Reference			WB1	WR1	WTB1
Date Sampled			05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water
Extracted ISTD <sup>13</sup> C <sub>3</sub> PFPeA	%		110	117	114
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFHxA	%		117	124	118
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFHpA	%		125	132	126
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOA	%		139	140	136
Extracted ISTD <sup>13</sup> C <sub>5</sub> PFNA	%		123	127	124
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFDA	%		134	133	127
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFUnDA	%		142	141	136
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFDoDA	%		112	116	110
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFTeDA	%		123	119	115
Extracted ISTD <sup>13</sup> C <sub>2</sub> 4:2FTS	%		105	102	101
Extracted ISTD <sup>13</sup> C <sub>2</sub> 6:2FTS	%		132	133	132
Extracted ISTD <sup>13</sup> C <sub>2</sub> 8:2FTS	%		139	139	140
Extracted ISTD <sup>13</sup> C <sub>8</sub> FOSA	%		80	96	90
Extracted ISTD d <sub>3</sub> N MeFOSA	%		40	58	55
Extracted ISTD d <sub>5</sub> N EtFOSA	%		40	56	53
Extracted ISTD d <sub>7</sub> N MeFOSE	%		75	89	80
Extracted ISTD d <sub>9</sub> N EtFOSE	%		76	90	84
Extracted ISTD d <sub>3</sub> N MeFOSAA	%		104	115	111
Extracted ISTD d <sub>5</sub> N EtFOSAA	%		127	149	150
Total Positive PFHxS & PFOS	µg/L	0.0002	<0.0002	<0.0002	<0.0002
Total Positive PFOS & PFOA	µg/L	0.0002	<0.0002	<0.0002	<0.0002
Total Positive PFAS	µg/L	0.0002	<0.0002	<0.0002	<0.0002

**Chlorophyll a & Phaeophytin a**

Our Reference	UNITS	PQL	266547-1	266547-2	266547-3	266547-4	266547-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date Extracted	-		06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021
Date Analysed	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Chlorophyll a	µg/L	0.1	1.8	2.3	1.6	0.3	2.5
Phaeophytin a	µg/L	0.2	2.0	1.7	1.3	2.1	4.6

**Chlorophyll a & Phaeophytin a**

Our Reference	UNITS	PQL	266547-6	266547-7	266547-8	266547-9	266547-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Type of sample			Water	Water	Water	Water	Water
Date Extracted	-		06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021
Date Analysed	-		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/08/2021
Chlorophyll a	µg/L	0.1	0.9	0.5	1.4	1.3	6.1
Phaeophytin a	µg/L	0.2	0.9	0.8	1.8	1.3	3.7

Method ID	Methodology Summary
Ext-058	Analysed by The Marine and Freshwater Research Laboratory, accreditation number 10603
INORG-005	Acidity - determined by titration based on APHA latest edition, Method 2310 B. Soils reported from a 1:5 water extract unless otherwise specified.
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition, Method 2320-B. Soils reported from a 1:5 water extract unless otherwise specified.
INORG-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180±10°C
INORG-019	Suspended Solids - determined gravimetrically by filtration of the sample. The solids are dried at 104±5°C
INORG-022	Turbidity - measured nephelometrically using a turbidimeter, in accordance with APHA latest edition, 2130 B.
INORG-040	Ion Balance Calculation: Cations in water by ICP-OES; Anions in water by IC; Alkalinity in water by Titration using APHA methods.
INORG-051	Determination of sulphide by titration and/or colourimetric determination. Note, the Sulphide is termed as Total Sulphide given any Sulphide contained in any sediment present may also included in the determination.
INORG-055	NOx - determined colourimetrically. Soils are analysed from a water extract.
INORG-057	Ammonia by colourimetric analysis based on APHA latest edition 4500-NH3 F.
INORG-060	Phosphate- determined colourimetrically. Soils are analysed from a water extract.
INORG-060	Total Phosphorus by colourimetric analysis based on APHA latest edition 4500-P J.
INORG-081	Anions - a range of anions are determined by Ion Chromatography based on APHA latest edition Method 4110-B. Soils and other sample types reported from a water extract unless otherwise specified (standard soil extract ratio 1:5).
INORG-110	Total Nitrogen by high temperature catalytic combustion with chemiluminescence detection. Dissolved/Total Carbon and Dissolved/Total Organic and Inorganic Carbon by high temperature catalytic combustion with NDIR
METALS-008	Hardness calculated from Calcium and Magnesium as per APHA latest edition 2340B.
METALS-020	Determination of various metals by ICP-AES.
METALS-021	Determination of Mercury by Cold Vapour AAS.  For urine samples total Mercury is determined, however, mercury in urine is almost entirely in the inorganic form (CDC).
METALS-022	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.

Method ID	Methodology Summary
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM draft B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-029	<p>Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLP/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3.</p> <p>Analysis is undertaken with LC-MS/MS.</p> <p>PFAS results include the sum of branched and linear isomers where applicable.</p> <p>Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.3 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components.</p> <p>Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.</p>

**Client Reference: EEC200092.002 - Fremantle Port**

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	266547-2
Date prepared	-			06/08/2021	1	06/08/2021	06/08/2021		06/08/2021	06/08/2021
Date analysed	-			06/08/2021	1	06/08/2021	06/08/2021		06/08/2021	06/08/2021
Total Dissolved Solids (grav)	mg/L	5	INORG-018	<5	1	8700	8800	1	118	[NT]
Total Suspended Solids	mg/L	5	INORG-019	<5	1	49	[NT]		100	[NT]
Turbidity	NTU	0.1	INORG-022	<0.1	1	8.7	[NT]		87	[NT]
Dissolved Organic Carbon	mg/L	1	INORG-110	<1	1	15	16	6	97	[NT]
Acidity as CaCO <sub>3</sub>	mg/L	5	INORG-005	<5	1	<5	<5	0	99	[NT]
Sulphide in water*	mg/L	0.5	INORG-051	<0.5	1	<0.5	[NT]		83	[NT]
Fluoride	mg/L	0.1	INORG-081	<0.1	1	0.3	0.3	0	101	95

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	2	06/08/2021	06/08/2021		[NT]	[NT]
Date analysed	-			[NT]	2	06/08/2021	06/08/2021		[NT]	[NT]
Total Dissolved Solids (grav)	mg/L	5	INORG-018	[NT]	2	8500	[NT]		[NT]	[NT]
Total Suspended Solids	mg/L	5	INORG-019	[NT]	2	21	20	5	[NT]	[NT]
Turbidity	NTU	0.1	INORG-022	[NT]	2	7.7	7.8	1	[NT]	[NT]
Dissolved Organic Carbon	mg/L	1	INORG-110	[NT]	2	16	[NT]		[NT]	[NT]
Acidity as CaCO <sub>3</sub>	mg/L	5	INORG-005	[NT]	2	<5	[NT]		[NT]	[NT]
Sulphide in water*	mg/L	0.5	INORG-051	[NT]	2	<0.5	[NT]		[NT]	[NT]
Fluoride	mg/L	0.1	INORG-081	[NT]	2	0.3	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	12	06/08/2021	06/08/2021		[NT]	[NT]
Date analysed	-			[NT]	12	06/08/2021	06/08/2021		[NT]	[NT]
Turbidity	NTU	0.1	INORG-022	[NT]	12	0.4	0.4	0	[NT]	[NT]

**Client Reference: EEC200092.002 - Fremantle Port**

QUALITY CONTROL: Ionic Balance					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			10/08/2021	1	10/08/2021	10/08/2021		10/08/2021	[NT]
Date analysed	-			10/08/2021	1	10/08/2021	10/08/2021		10/08/2021	[NT]
Calcium - Dissolved	mg/L	0.5	METALS-020	<0.5	1	94	96	2	96	[NT]
Potassium - Dissolved	mg/L	0.5	METALS-020	<0.5	1	58	60	3	94	[NT]
Magnesium - Dissolved	mg/L	0.5	METALS-020	<0.5	1	250	260	4	95	[NT]
Sodium - Dissolved	mg/L	0.5	METALS-020	<0.5	1	2100	2200	5	94	[NT]
Bicarbonate HCO <sub>3</sub> as CaCO <sub>3</sub>	mg/L	5	INORG-006	<5	1	90	89	1	107	[NT]
Carbonate CO <sub>3</sub> <sup>2-</sup> as CaCO <sub>3</sub>	mg/L	5	INORG-006	<5	1	<5	<5	0	107	[NT]
Total Alkalinity as CaCO <sub>3</sub>	mg/L	5	INORG-006	<5	1	90	89	1	107	[NT]
Chloride	mg/L	1	INORG-081	<1	1	4100	4100	0	98	[NT]
Sulphate	mg/L	1	INORG-081	<1	1	550	550	0	100	[NT]
Hardness as CaCO <sub>3</sub>	mg/L	3	METALS-008	<3	1	1300	1300	0	[NT]	[NT]

**Client Reference: EEC200092.002 - Fremantle Port**

QUALITY CONTROL: Nutrients in Water					Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	266547-2	
Date prepared	-			06/08/2021	1	06/08/2021	06/08/2021		06/08/2021	06/08/2021	
Date analysed	-			06/08/2021	1	06/08/2021	06/08/2021		06/08/2021	06/08/2021	
Total Nitrogen	mg/L	0.1	INORG-110	<0.1	1	1.6	1.6	0	92	81	
NOx as N	mg/L	0.005	INORG-055	<0.005	1	0.56	0.56	0	92	102	
Ammonia as N	mg/L	0.005	INORG-057	<0.005	1	0.095	0.10	5	92	101	
Total Phosphorus	mg/L	0.01	INORG-060	<0.01	1	0.06	0.06	0	106	112	
Phosphate as P	mg/L	0.005	INORG-060	<0.005	1	0.036	0.037	3	118	106	

**Client Reference: EEC200092.002 - Fremantle Port**

QUALITY CONTROL: Total Metals in water							Duplicate		Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	266547-2
Date digested	-			11/08/2021	1	11/08/2021	11/08/2021		11/08/2021	[NT]
Date analysed	-			11/08/2021	1	11/08/2021	11/08/2021		11/08/2021	[NT]
Aluminium-Total	mg/L	0.01	METALS-022	<0.01	1	0.38	0.39	3	100	[NT]
Iron-Total	mg/L	0.01	METALS-022	<0.01	1	0.83	0.80	4	116	[NT]

**Client Reference: EEC200092.002 - Fremantle Port**

QUALITY CONTROL: Dissolved Metals in Water					Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	266547-2	
Date prepared	-			11/08/2021	1	11/08/2021	11/08/2021		11/08/2021	11/08/2021	
Date analysed	-			11/08/2021	1	11/08/2021	11/08/2021		11/08/2021	11/08/2021	
Silver-Dissolved Ultra Low	mg/L	0.00005	METALS-022	<0.00005	1	<0.00005	<0.00005	0	97	79	
Aluminium-Dissolved	mg/L	0.01	METALS-022	<0.01	1	0.06	0.05	18	103	87	
Arsenic-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.001	<0.001	0	101	104	
Cadmium-Dissolved	mg/L	0.0001	METALS-022	<0.0001	1	<0.0001	<0.0001	0	100	100	
Cobalt-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.001	<0.001	0	99	95	
Chromium-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.001	<0.001	0	103	100	
Copper-Dissolved	mg/L	0.001	METALS-022	<0.001	1	0.003	0.002	40	101	92	
Iron-Dissolved	mg/L	0.01	METALS-022	<0.01	1	0.24	0.25	4	106	97	
Mercury-Dissolved	mg/L	0.00005	METALS-021	<0.00005	1	<0.00005	<0.00005	0	104	97	
Manganese-Dissolved	mg/L	0.005	METALS-022	<0.005	1	0.031	0.031	0	101	98	
Molybdenum-Dissolved	mg/L	0.001	METALS-022	<0.001	1	0.003	0.003	0	104	109	
Nickel-Dissolved	mg/L	0.001	METALS-022	<0.001	1	0.001	0.001	0	101	94	
Lead-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.001	<0.001	0	93	84	
Antimony-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.001	<0.001	0	99	83	
Selenium-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.001	<0.001	0	103	104	
Zinc-Dissolved	mg/L	0.001	METALS-022	<0.001	1	0.004	0.004	0	101	97	
Silicon - Dissolved	mg/L	0.1	METALS-020	<0.1	1	3.3	3.5	6	95	117	

**Client Reference: EEC200092.002 - Fremantle Port**

QUALITY CONTROL: Dissolved Metals in Water							Duplicate		Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	11/08/2021	11/08/2021		[NT]	[NT]
Date analysed	-			[NT]	11	11/08/2021	11/08/2021		[NT]	[NT]
Silver-Dissolved Ultra Low	mg/L	0.00005	METALS-022	[NT]	11	<0.00005	<0.00005	0	[NT]	[NT]
Aluminium-Dissolved	mg/L	0.01	METALS-022	[NT]	11	<0.01	<0.01	0	[NT]	[NT]
Arsenic-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	<0.001	0	[NT]	[NT]
Cadmium-Dissolved	mg/L	0.0001	METALS-022	[NT]	11	<0.0001	<0.0001	0	[NT]	[NT]
Cobalt-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	<0.001	0	[NT]	[NT]
Chromium-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	<0.001	0	[NT]	[NT]
Copper-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	<0.001	0	[NT]	[NT]
Iron-Dissolved	mg/L	0.01	METALS-022	[NT]	11	<0.01	<0.01	0	[NT]	[NT]
Mercury-Dissolved	mg/L	0.00005	METALS-021	[NT]	11	<0.00005	[NT]		[NT]	[NT]
Manganese-Dissolved	mg/L	0.005	METALS-022	[NT]	11	<0.005	<0.005	0	[NT]	[NT]
Molybdenum-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	<0.001	0	[NT]	[NT]
Nickel-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	<0.001	0	[NT]	[NT]
Lead-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	<0.001	0	[NT]	[NT]
Antimony-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	<0.001	0	[NT]	[NT]
Selenium-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	<0.001	0	[NT]	[NT]
Zinc-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	<0.001	0	[NT]	[NT]
Silicon - Dissolved	mg/L	0.1	METALS-020	[NT]	11	<0.1	[NT]		[NT]	[NT]

**Client Reference: EEC200092.002 - Fremantle Port**

QUALITY CONTROL: vTRH(C6-C10)/MBTEXN in water							Duplicate		Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date analysed	-			06/08/2021	[NT]	[NT]	[NT]	[NT]	06/08/2021	[NT]
TRH C <sub>6</sub> - C <sub>9</sub>	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	101	[NT]
TRH C <sub>6</sub> - C <sub>10</sub>	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	101	[NT]
MTBE	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	100	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	97	[NT]	[NT]	[NT]	[NT]	106	[NT]
Surrogate toluene-d8	%		Org-023	89	[NT]	[NT]	[NT]	[NT]	90	[NT]
Surrogate 4-BFB	%		Org-023	101	[NT]	[NT]	[NT]	[NT]	102	[NT]

**Client Reference: EEC200092.002 - Fremantle Port**

QUALITY CONTROL: svTRH(C10-C40) in water					Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	266547-11	
Date extracted	-			10/08/2021	1	10/08/2021	10/08/2021		10/08/2021	10/08/2021	
Date analysed	-			10/08/2021	1	10/08/2021	10/08/2021		10/08/2021	10/08/2021	
TRH C <sub>10</sub> - C <sub>14</sub>	µg/L	50	Org-020	<50	1	<50	<50	0	77	85	
TRH C <sub>15</sub> - C <sub>28</sub>	µg/L	100	Org-020	<100	1	<100	<100	0	81	89	
TRH C <sub>29</sub> - C <sub>36</sub>	µg/L	100	Org-020	<100	1	<100	<100	0	71	77	
TRH >C <sub>10</sub> - C <sub>16</sub>	µg/L	50	Org-020	<50	1	<50	<50	0	77	85	
TRH >C <sub>16</sub> - C <sub>34</sub>	µg/L	100	Org-020	<100	1	<100	<100	0	80	88	
TRH >C <sub>34</sub> - C <sub>40</sub>	µg/L	100	Org-020	<100	1	<100	<100	0	73	79	
Surrogate o-Terphenyl	%		Org-020	76	1	94	103	9	96	94	

**Client Reference: EEC200092.002 - Fremantle Port**

QUALITY CONTROL: PAHs in Water					Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	266547-3	
Date extracted	-			11/08/2021	2	11/08/2021	11/08/2021		11/08/2021	11/08/2021	
Date analysed	-			17/08/2021	2	17/08/2021	17/08/2021		17/08/2021	17/08/2021	
Naphthalene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	113	120	
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]	
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]	
Fluorene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	107	118	
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	113	118	
Anthracene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]	
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	108	117	
Pyrene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	113	119	
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]	
Chrysene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	110	105	
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	2	<0.2	<0.2	0	[NT]	[NT]	
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	110	118	
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]	
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]	
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]	
Surrogate p-Terphenyl-D <sub>14</sub>	%		Org-022/025	109	2	86	91	6	104	93	

QUALITY CONTROL: PAHs in Water					Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]	
Date extracted	-			[NT]	4	11/08/2021	11/08/2021		[NT]	[NT]	
Date analysed	-			[NT]	4	17/08/2021	17/08/2021		[NT]	[NT]	
Naphthalene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Acenaphthylene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Acenaphthene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Fluorene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Phenanthrene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Anthracene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Fluoranthene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Pyrene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Benzo(a)anthracene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Chrysene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	[NT]	4	<0.2	<0.2	0	[NT]	[NT]	
Benzo(a)pyrene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]	
Surrogate p-Terphenyl-D <sub>14</sub>	%		Org-022/025	[NT]	4	99	117	17	[NT]	[NT]	

**Client Reference: EEC200092.002 - Fremantle Port**

QUALITY CONTROL: Low Level OCP in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	266547-3
Date extracted	-			11/08/2021	2	11/08/2021	11/08/2021		11/08/2021	11/08/2021
Date analysed	-			17/08/2021	2	17/08/2021	17/08/2021		17/08/2021	17/08/2021
Hexachlorobenzene (HCB)	µg/L	0.01	Org-022/025	<0.01	2	<0.01	<0.01	0	[NT]	[NT]
a-BHC	µg/L	0.05	Org-022/025	<0.05	2	<0.05	<0.05	0	99	126
Lindane (g-BHC)	µg/L	0.05	Org-022/025	<0.05	2	<0.05	<0.05	0	[NT]	[NT]
b-BHC	µg/L	0.05	Org-022/025	<0.05	2	<0.05	<0.05	0	105	97
Heptachlor	µg/L	0.01	Org-022/025	<0.01	2	<0.01	<0.01	0	101	131
d-BHC	µg/L	0.05	Org-022/025	<0.05	2	<0.05	<0.05	0	[NT]	[NT]
Aldrin	µg/L	0.01	Org-022/025	<0.01	2	<0.01	<0.01	0	111	115
Heptachlor Epoxide	µg/L	0.01	Org-022/025	<0.01	2	<0.01	<0.01	0	98	115
g-Chlordane	µg/L	0.01	Org-022/025	<0.01	2	<0.01	<0.01	0	[NT]	[NT]
a-Chlordane	µg/L	0.01	Org-022/025	<0.01	2	<0.01	<0.01	0	[NT]	[NT]
a-Endosulfan	µg/L	0.02	Org-022/025	<0.02	2	<0.02	<0.02	0	[NT]	[NT]
pp-DDE	µg/L	0.01	Org-022/025	<0.01	2	<0.01	<0.01	0	99	125
Dieldrin	µg/L	0.01	Org-022/025	<0.01	2	<0.01	<0.01	0	103	120
Endrin	µg/L	0.01	Org-022/025	<0.01	2	<0.01	<0.01	0	[NT]	[NT]
pp-DDD	µg/L	0.01	Org-022/025	<0.01	2	<0.01	<0.01	0	101	127
b-Endosulfan	µg/L	0.02	Org-022/025	<0.02	2	<0.02	<0.02	0	[NT]	[NT]
pp-DDT	µg/L	0.006	Org-022/025	<0.006	2	<0.006	<0.006	0	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.02	Org-022/025	<0.02	2	<0.02	<0.02	0	91	116
Methoxychlor	µg/L	0.02	Org-022/025	<0.02	2	<0.02	<0.02	0	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022/025	109	2	103	107	4	104	112

**Client Reference: EEC200092.002 - Fremantle Port**

QUALITY CONTROL: Low Level OCP in water						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	4	11/08/2021	11/08/2021		[NT]	[NT]
Date analysed	-			[NT]	4	17/08/2021	17/08/2021		[NT]	[NT]
Hexachlorobenzene (HCB)	µg/L	0.01	Org-022/025	[NT]	4	<0.01	<0.01	0	[NT]	[NT]
a-BHC	µg/L	0.05	Org-022/025	[NT]	4	<0.05	<0.05	0	[NT]	[NT]
Lindane (g-BHC)	µg/L	0.05	Org-022/025	[NT]	4	<0.05	<0.05	0	[NT]	[NT]
b-BHC	µg/L	0.05	Org-022/025	[NT]	4	<0.05	<0.05	0	[NT]	[NT]
Heptachlor	µg/L	0.01	Org-022/025	[NT]	4	<0.01	<0.01	0	[NT]	[NT]
d-BHC	µg/L	0.05	Org-022/025	[NT]	4	<0.05	<0.05	0	[NT]	[NT]
Aldrin	µg/L	0.01	Org-022/025	[NT]	4	<0.01	<0.01	0	[NT]	[NT]
Heptachlor Epoxide	µg/L	0.01	Org-022/025	[NT]	4	<0.01	<0.01	0	[NT]	[NT]
g-Chlordane	µg/L	0.01	Org-022/025	[NT]	4	<0.01	<0.01	0	[NT]	[NT]
a-Chlordane	µg/L	0.01	Org-022/025	[NT]	4	<0.01	<0.01	0	[NT]	[NT]
a-Endosulfan	µg/L	0.02	Org-022/025	[NT]	4	<0.02	<0.02	0	[NT]	[NT]
pp-DDE	µg/L	0.01	Org-022/025	[NT]	4	<0.01	<0.01	0	[NT]	[NT]
Dieldrin	µg/L	0.01	Org-022/025	[NT]	4	<0.01	<0.01	0	[NT]	[NT]
Endrin	µg/L	0.01	Org-022/025	[NT]	4	<0.01	<0.01	0	[NT]	[NT]
pp-DDD	µg/L	0.01	Org-022/025	[NT]	4	<0.01	<0.01	0	[NT]	[NT]
b-Endosulfan	µg/L	0.02	Org-022/025	[NT]	4	<0.02	<0.02	0	[NT]	[NT]
pp-DDT	µg/L	0.006	Org-022/025	[NT]	4	<0.006	<0.006	0	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.02	Org-022/025	[NT]	4	<0.02	<0.02	0	[NT]	[NT]
Methoxychlor	µg/L	0.02	Org-022/025	[NT]	4	<0.02	<0.02	0	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022/025	[NT]	4	115	137	17	[NT]	[NT]

**Client Reference: EEC200092.002 - Fremantle Port**

QUALITY CONTROL: PFAS in Water TRACE Extended							Duplicate		Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			17/08/2021	[NT]	[NT]	[NT]	[NT]	17/08/2021	[NT]
Date analysed	-			17/08/2021	[NT]	[NT]	[NT]	[NT]	17/08/2021	[NT]
Perfluorobutanesulfonic acid	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	97	[NT]
Perfluoropentanesulfonic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	100	[NT]
Perfluorohexanesulfonic acid	µg/L	0.0002	Org-029	<0.0002	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorooctanesulfonate PFOS	µg/L	0.0002	Org-029	<0.0002	[NT]	[NT]	[NT]	[NT]	94	[NT]
Perfluorodecanesulfonic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	68	[NT]
Perfluorobutanoic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	94	[NT]
Perfluoropentanoic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorohexanoic acid	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluoroheptanoic acid	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.0002	Org-029	<0.0002	[NT]	[NT]	[NT]	[NT]	97	[NT]
Perfluorononanoic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	96	[NT]
Perfluorodecanoic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	97	[NT]
Perfluoroundecanoic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	92	[NT]
Perfluorododecanoic acid	µg/L	0.005	Org-029	<0.005	[NT]	[NT]	[NT]	[NT]	99	[NT]
Perfluorotridecanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	94	[NT]
Perfluorotetradecanoic acid	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	101	[NT]
4:2 FTS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	98	[NT]
6:2 FTS	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	98	[NT]
8:2 FTS	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	94	[NT]
10:2 FTS	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorooctane sulfonamide	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	103	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.005	Org-029	<0.005	[NT]	[NT]	[NT]	[NT]	105	[NT]
N-Ethyl perfluorooctanesulfon -amide	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	104	[NT]
N-Me perfluorooctanesulfonamid -oethanol	µg/L	0.005	Org-029	<0.005	[NT]	[NT]	[NT]	[NT]	106	[NT]
N-Et perfluorooctanesulfonamid -oethanol	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	95	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	99	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate <sup>13</sup> C <sub>8</sub> PFOS	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate <sup>13</sup> C <sub>2</sub> PFOA	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD <sup>13</sup> C <sub>3</sub> PFBS	%		Org-029	85	[NT]	[NT]	[NT]	[NT]	87	[NT]

**Client Reference: EEC200092.002 - Fremantle Port**

QUALITY CONTROL: PFAS in Water TRACE Extended							Duplicate		Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Extracted ISTD <sup>18</sup> O <sub>2</sub> PFHxS	%		Org-029	85	[NT]	[NT]	[NT]	[NT]	87	[NT]
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOS	%		Org-029	87	[NT]	[NT]	[NT]	[NT]	88	[NT]
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFBA	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD <sup>13</sup> C <sub>3</sub> PFPeA	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	90	[NT]
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFHxA	%		Org-029	92	[NT]	[NT]	[NT]	[NT]	94	[NT]
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFHpA	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	93	[NT]
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOA	%		Org-029	105	[NT]	[NT]	[NT]	[NT]	105	[NT]
Extracted ISTD <sup>13</sup> C <sub>5</sub> PFNA	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFDA	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFUnDA	%		Org-029	89	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFDoDA	%		Org-029	119	[NT]	[NT]	[NT]	[NT]	131	[NT]
Extracted ISTD <sup>13</sup> C <sub>2</sub> PFTeDA	%		Org-029	83	[NT]	[NT]	[NT]	[NT]	94	[NT]
Extracted ISTD <sup>13</sup> C <sub>2</sub> 4:2FTS	%		Org-029	78	[NT]	[NT]	[NT]	[NT]	82	[NT]
Extracted ISTD <sup>13</sup> C <sub>2</sub> 6:2FTS	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD <sup>13</sup> C <sub>2</sub> 8:2FTS	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	109	[NT]
Extracted ISTD <sup>13</sup> C <sub>8</sub> FOSA	%		Org-029	71	[NT]	[NT]	[NT]	[NT]	70	[NT]
Extracted ISTD d <sub>3</sub> N MeFOSA	%		Org-029	48	[NT]	[NT]	[NT]	[NT]	47	[NT]
Extracted ISTD d <sub>5</sub> N EtFOSA	%		Org-029	42	[NT]	[NT]	[NT]	[NT]	49	[NT]
Extracted ISTD d <sub>7</sub> N MeFOSE	%		Org-029	63	[NT]	[NT]	[NT]	[NT]	71	[NT]
Extracted ISTD d <sub>9</sub> N EtFOSE	%		Org-029	69	[NT]	[NT]	[NT]	[NT]	77	[NT]

QUALITY CONTROL: PFAS in Water TRACE Extended							Duplicate		Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Extracted ISTD d <sub>3</sub> N MeFOSAA	%		Org-029	88	[NT]	[NT]	[NT]	[NT]	80	[NT]
Extracted ISTD d <sub>5</sub> N EtFOSAA	%		Org-029	125	[NT]	[NT]	[NT]	[NT]	132	[NT]

## Result Definitions

<b>NT</b>	Not tested
<b>NA</b>	Test not required
<b>INS</b>	Insufficient sample for this test
<b>PQL</b>	Practical Quantitation Limit
<	Less than
>	Greater than
<b>RPD</b>	Relative Percent Difference
<b>LCS</b>	Laboratory Control Sample
<b>NS</b>	Not specified
<b>NEPM</b>	National Environmental Protection Measure
<b>NR</b>	Not Reported

## Quality Control Definitions

<b>Blank</b>	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
<b>Duplicate</b>	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
<b>Matrix Spike</b>	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
<b>LCS (Laboratory Control Sample)</b>	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
<b>Surrogate Spike</b>	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

## Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

## **Report Comments**

Chlorophyll and Phaeophytins subcontracted to Marine and Freshwater Labs, Murdoch University, report reference MPL 21-26.

PFAS analysis performed by Envirolab Services Pty Ltd, NSW, report reference 275575.

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

MeFOSA and EtFOSA Extracted Internal Standard is outside of global acceptance criteria (50-150%) for (LCS and/or MB) but within analyte specific acceptance criteria.

#1-4, 8-10 - vTRH(C6-C10)/MBTEXN in water: PQL has been raised due to the sample matrix requiring dilution.

The mass imbalance may be caused by other ions that have not been measured - all major cations and anions have been checked and confirmed.

This report replaces the original report dated 20/08/2021 due to amendments of Sample ID (266547-6 and 7).

## **CHAIN OF CUSTODY**

Level 2, 27-31 Troode Street  
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Tel: (618) 9211 1111  
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Page number: 1

**Turnaround time:** Standard

Quote number: 20p194V2

**Remarks**



## DATA QUALITY ASSESSMENT SUMMARY

### **Report Details**

Envirolab Report Reference	<b><u>266547</u></b>
Client ID	RPS Australia West Pty Ltd
Project Reference	EEC200092.002 - Fremantle Port
Date Issued	20/08/2021

### **QC DATA**

All laboratory QC data was within the Envirolab Group's specifications.

### **HOLDING TIME COMPLIANCE EVALUATION**

All preservation / holding times (based on AS/ASPH/ISO/NEPM/USEPA reference documents and standards) are compliant.

Certain analyses have had their recommended technical holding times elongated by filtering and/or freezing on receipt at the laboratory (e.g. BOD, chlorophyll/Pheophytin, nutrients and acid sulphate soil tests).

### **COMPLIANCE TO QC FREQUENCY (NEPM)**

Internal laboratory QC rate complies with NEPM requirements (LCS/MB/MS 1 in 20, Duplicates 1 in 10 samples). Note, samples are batched together with other sample consignments in order to assign QC sample frequency.

### **QC Evaluation**

Duplicate(s) was performed as per NEPM frequency	✓
Laboratory Control Sample(s) were analysed with the samples received	✓
A Method Blank was performed with the samples received	✓
Matrix spike(s) was performed as per NEPM frequency (Not Applicable for Air samples)	✓

Refer to Certificate of Analysis for all Quality Control data.

## **Appendix C**

### **Surface water sampling logs**

## MULTI-PARAMETER METER CALIBRATION RECORD



Project number: EEC20092.002

**Site location:** Swan River Crossing - Fremantle

Multi-parameter meter details		Solution	Batch / lot	Batch date	Zobell B solution, for Ag/AgCl saturated KCl electrode				Calibration notes:
Manufacturer:	YSI	pH 4 buffer			T °C	mV	T °C	mV	
Model number:	ProQuatro	pH 7 buffer			5	273	20	240	
Serial number:	19B100163 (LA10)	EC buffer			10	262	25	229	
		Zobell B			15	251	30	218	

## SURFACE WATER SAMPLING LOG



<b>Project number:</b> EEC20092.002	<b>Sampling method:</b>	Nisken Flask
<b>Site name:</b> Fremantle Ports - Surface Water	<b>0.45 micron filter used (Y/N):</b>	Yes
<b>Sampling area:</b> Fremantle Railway Bridge	<b>Sample preservation (ice/esky):</b>	Yes
<b>Sampling location:</b> WS1	<b>QAQC samples:</b>	---
<b>Scientist:</b> ZL + ME	<b>Tide (High/Low):</b>	High
<b>Date:</b> 05/08/2021	<b>Tide Height (m):</b>	1.16
<b>Weather:</b> Fine	<b>Water Column (m):</b>	3.6

**Additional details / comments:**

**Other:** Strong outgoing current. Water was brown and turbid

## SURFACE WATER SAMPLING LOG



<b>Project number:</b> EEC20092.002	<b>Sampling method:</b>	Nisken Flask
<b>Site name:</b> Fremantle Ports - Surface Water	<b>0.45 micron filter used (Y/N):</b>	Yes
<b>Sampling area:</b> Fremantle Railway Bridge	<b>Sample preservation (ice/esky):</b>	Yes
<b>Sampling location:</b> WS2	<b>QAQC samples:</b>	Duplicate WSZ sampled at WS2-D
<b>Scientist:</b> ZL + ME	<b>Tide (High/Low):</b>	High
<b>Date:</b> 05/08/2021	<b>Tide Height (m):</b>	1.16
<b>Weather:</b> Fine	<b>Water Column (m):</b>	5.1

### **Additional details / comments**

**Other:** Strong outgoing current. Boat with diver working next to sampling point - engine running. Heavy fluctuations in numbers while collecting data at most depths.

## **SURFACE WATER SAMPLING LOG**



## **SURFACE WATER SAMPLING LOG**



<b>Project number:</b> EEC20092.002	<b>Sampling method:</b>	Nisken Flask
<b>Site name:</b> Fremantle Ports - Surface Water	<b>0.45 micron filter used (Y/N):</b>	Yes
<b>Sampling area:</b> Fremantle Railway Bridge	<b>Sample preservation (ice/esky):</b>	Yes
<b>Sampling location:</b> WS4	<b>QAQC samples:</b>	---
<b>Scientist:</b> ZL + ME	<b>Tide (High/Low):</b>	High
<b>Date:</b> 05/08/2021	<b>Tide Height (m):</b>	1.16
<b>Weather:</b> Fine	<b>Water Column (m):</b>	4.5

**Additional details / comments:**

**Other:** Strong outgoing current. Water was brown and turbid. One tug boat and one other vessel on jetty. Activity, two boats with divers) on and below bridge. Lots of water traffic.

## **SURFACE WATER SAMPLING LOG**



<b>Project number:</b> EEC20092.002	<b>Sampling method:</b>	Nisken Flask
<b>Site name:</b> Fremantle Ports - Surface Water	<b>0.45 micron filter used (Y/N):</b>	Yes
<b>Sampling area:</b> Fremantle Railway Bridge	<b>Sample preservation (ice/esky):</b>	Yes
<b>Sampling location:</b> WS5	<b>QAQC samples:</b>	---
<b>Scientist:</b> ZL + ME	<b>Tide (High/Low):</b>	High
<b>Date:</b> 05/08/2021	<b>Tide Height (m):</b>	1.16
<b>Weather:</b> Fine	<b>Water Column (m):</b>	7.4

**Additional details / comments:**

**Other:** Strong outgoing current. Water is brown and turbid.