


MP07_0171 MOD 2 Hexham Train Support Facility

Operational Compliance Report (2022)

26 April 2023



Plan Approval Table

Position	Name	Signature	Date
Principal Adviser Environment	Harry Egan		24/04/23

Revision History

Rev	Date	Author	Comments
1	3/03/23	Harry Egan	Final
2	24/04/23	Harry Egan	Response to DPE comments

Table of Contents

1.0	Introduction	4
1.1	Site Description	4
1.2	Operational Activities	7
1.3	Legislative Context	7
1.4	Key Project Personnel	7
2.0	Site Activities	9
2.1	Activities During the Reporting Period	9
2.2	2021 OCR DPE Requests	9
2.3	OEMP and CEMP Updates	10
2.4	2021 IEA Actions Status	10
3.0	Surface and Groundwater Monitoring	12
3.1	Legislative Context	12
3.2	Monitoring Network	12
3.3	Meteorology	15
3.4	Results	15
4.0	Compliance	20
4.1	Compliance Summary	20
4.2	Non-Compliance	21
4.3	Previous Report Actions	21
4.4	Complaints	21
4.5	Notifiable Incidents	21
4.6	Inspections and Audits	21
	APPENDICES	22
	APPENDIX A - Compliance Register	23
	APPENDIX B – Non-Compliances Register	51
	APPENDIX C – Hexham TSF Annual Water Monitoring Report 2022 (GHD, February 2023)	54
	APPENDIX D – Compliance Report Declaration Form	55

Table of Figures

Figure 1 - Site Layout	5
Figure 2 - Indicative Offset Site (red box) - Lot 49 DP 754431 / Lot 1 DP 127907	6
Figure 3 - Surface and Groundwater Monitoring Locations	14
Figure 4 - Annual Rainfall Summary – Hexham Bridge (Station 210448)	15

Table of Tables

Table 1 - Project Information	7
Table 2 - Key Project Personnel.....	8
Table 3 - Summary of Reporting Period Project Activities	9
Table 4 - DPE 2021 Requests.....	9
Table 5 - OEMP (Rev 10) and Supporting Document Updates	10
Table 6 - Hexham Train Facility - IEA 2022 Response to Auditor Recommendations	11
Table 7 - Monitoring Network and Program	12
Table 8 - Surface and Groundwater Scheduled Monitoring Compliance Summary	16
Table 9 - Compliance Status Descriptors.....	20
Table 10 - Compliance Summary.....	20
Table 11 - Previous Report Actions.....	21
Table 12 - Complaints	21

Glossary

Term	Definitions
Aurizon	Aurizon Operations Pty Ltd
the Approval	MP07_0171 MOD 2
CWR	Coal Washery Reject
DAF	Dissolved Aeration Flotation
DPE	Department of Planning and Environment
EPL	Environmental Protection Licence
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
Hexham Train Support Facility	The Site
IEA	630.30267-R01-Hexham TSF Independent Environmental Audit 2021
OCR	Operational Compliance Report
OEMP	Operational Environmental Management Plan
SGMP	Surface and Groundwater Management Plan
the Site	Aurizon Hexham Train Support Facility
SMP	Site Management Plan
SSI	State Significant Infrastructure
TSF	Train Support Facility

1.0 Introduction

1.1 Site Description

The Aurizon Operations Pty Ltd (**Aurizon**) Hexham Train Support Facility (**the Site**) has a total area of 255ha and is located at Hexham approximately 16km north-west of the Newcastle Central Business District.

The Site shares borders with the Main Northern Railway and Pacific Highway to the east and the New England Highway to the north. To the south and west rural properties and the Hexham Swamp Nature Reserve are adjacent. The Site is located within a predominantly industrial setting, with only a small number of residential dwellings within the local vicinity.

The Site's history as a coal handling facility has resulted in the southern portion of the site containing an abandoned rail loop corridor and coal washery reject (**CWR**). CWR is retained within vegetated stockpiles however it is also present extensively in sub surface deposits. Remediation completed during the construction of the TSF infrastructure has resulted in excavated CWR and potential acid sulphate soil being stockpiled in the southern portion of the site

Infrastructure associated with the Site is restricted to approximately a 38 hectare area and consists of:

- Seven train tracks (10.5 kilometres) parallel to the existing mainline, turning angle and a shunt track;
- a provisioning building, service vehicle garage and combined maintenance/administrative centre;
- surface water management infrastructure including retention basins;
- bulk fuel storage area;
- A wastewater treatment plant with on-site effluent irrigation and dissolved aeration floatation plant (DAF).

Brancourts Manufacturing and Processing Pty Ltd are currently licensed to use a portion of the site for a waste water treatment plant and effluent irrigation area under Environmental Protection Licence (EPL) 816. Effluent is irrigated over the above mentioned CWR stockpiles.



Figure 1 - Site Layout

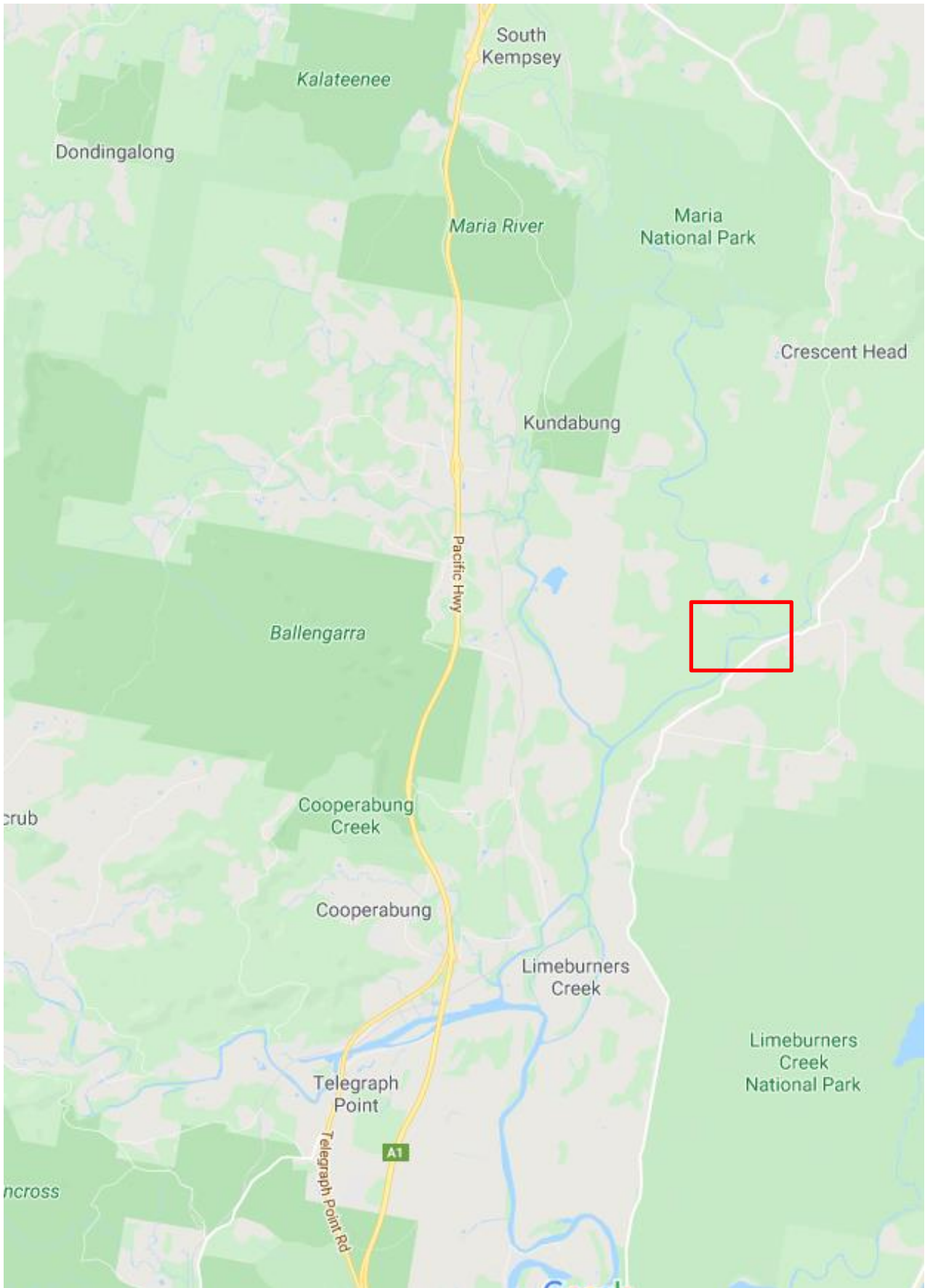


Figure 2 - Indicative Offset Site (red box) - Lot 49 DP 754431 / Lot 1 DP 127907

1.2 Operational Activities

The Site provides routine and ad hoc provisioning and maintenance services for outbound locomotives and wagons at its Provisioning and Combined Maintenance Facilities respectively. Additional provisioning is undertaken at identified and prepared direct into locomotive refuelling locations as required.

The treatment of generated septic and operational wastewater is undertaken onsite through the utilisation of a septic treatment plant and DAF plant respectively.

1.3 Legislative Context

The project was assessed and approved as State Significant Infrastructure (**SSI**) under Part 5.1 of the *Environmental Planning and Assessment Act 1979 (EP&A Act)*.

The Site was approved by a delegate of the Minister for Planning and Infrastructure under MP07_0171, dated 10 October 2013. The Hexham TSF Turning Angle (**the Turning Angle**) Modification MP 07_0171 MOD 1 (SSI-6090) was approved on the 09 October 2019 with The Hexham Depot and Wagon Stowage Area Modification MP 07_0171 MOD 2 (**the Approval**) approved in September 2022.

The Approval permits the ongoing operation of the TSF and simultaneous construction/operation of the Turning Angle.

This Operational Compliance Report (**OCR**) covers the period 01 January 2022 to 31 December 2022. This report has been developed to comply with Condition D5 of the Approval and Section 4.1 of the Operational Environmental Management Plan (**OEMP**). Project information is detailed in Table 1.

Table 1 - Project Information

Criteria	Information
Project Name	Aurizon Hexham Train Support Facility
Construction Start Date	2014
Operational Date	2014/15 - Ongoing
Site Address	Off Anderson Drive, Hexham, NSW, 2322
Project Application Number	State Significant Infrastructure MP07_0171 (SSI 6090) MOD 2
Compliance Report	MP07_0171 MOD 2 Operational Compliance Report (2022)
Project Phase	Operation and construction (MOD 2 depot infrastructure only)
Reporting Period	01 January 2022 – 31 December 2022

1.4 Key Project Personnel

The key project personnel who are responsible for environmental management of the Project are listed in Table 2 below.

Table 2 - Key Project Personnel

Name	Company	Position	Contact Details
Dave Mayo	Aurizon	Regional Maintenance Manager	Upon request
Harry Egan	Aurizon	Senior Adviser Environment	Upon request

2.0 Site Activities

2.1 Activities During the Reporting Period

Activities undertaken during the reporting period and planned for 2023 calendar year are listed in Table 3 below.

Table 3 - Summary of Reporting Period Project Activities

Calendar Year	Activity	Comment	Activity Status
2022	MOD 2 CEMP update	CEMP's updated and approved in September 2022.	Complete
2022	Commencement of Depot construction	Construction commenced on the 9 th December 2022	Ongoing
2022/23	Routine maintenance and provisioning activities	Refer Section 1.2	Ongoing
2022/23	Surface and Groundwater Monitoring	Refer Section 3.0	Ongoing
2022/23	Hexham Train Facility Mod 2 - Depot Relocation and Wagon Stowage(SS1-6090-Mod-2)	Construction of approved infrastructure	Ongoing
2023	OEMP update	Document in final draft and to be submitted to DPE in March 2023	Ongoing
2023	Hexham Depot commissioning	Relocation of Mayfield workforce to constructed Hexham Depot. In August.	Scheduled

2.2 2021 OCR DPE Requests

Following review of the 2020 OCR the Department of Planning and Environment (**DPE**), in compliance with Condition B3 of the Approval, no additional information has been requested to be included in the 2021 OCR as per Table 4 below.

Table 4 - DPE 2021 Requests

Request	Section	Comment
Upload the Hexham Train Facility – IEA 2022 and Response to Audit Recommendations to the website by 30 June 2022.	N/A	Complete

Include a status update for all actions provided in the RAR in the next Annual Operation Compliance Report, until all actions are completed.

2.4

N/A

2.3 OEMP and CEMP Updates

The CEMP and associated sub plans were reviewed as required by the Approval to permit construction of the Hexham Depot. Completed updates are detailed in Table 5 below.

The Site OEMP documentation has been reviewed in February 2023 and are currently due for submission to the DPE in March 2023.

Table 5 - OEMP (Rev 10) and Supporting Document Updates

Document	Section	Update Details	Justification
CEMP	Various	General update.	MOD 2 approval requirement.
CAHMP	Various	General update.	MOD 2 approval requirement
CAQMP	Various	General update.	MOD 2 approval requirement
CCMP	Various	General update.	MOD 2 approval requirement
CCSP	Various	General update.	MOD 2 approval requirement
CNVMP	Various	General update.	MOD 2 approval requirement
CNIHMP	Various	General update.	MOD 2 approval requirement
CTMP	Various	General update.	MOD 2 approval requirement
CWSMP	Various	General update.	MOD 2 approval requirement

2.4 2021 IEA Actions Status

Actions relating to non-compliances and recommendations for improvement which have not been previously closed out are detailed in Table 6.

Table 6 - Hexham Train Facility - IEA 2022 Response to Auditor Recommendations

Rec #	Recommendation	Comment	Status
NC REC 1	The Surface Water and Groundwater Monitoring Program should be updated to include reference to cumulative impacts and their management as required by Condition C19(h). If cumulative impacts are no longer required to be monitored following the completion of construction the Plan should clarify and justify.	N/A	Complete
NC REC 2	Establish (or review) system to ensure required submissions to regulatory authorities are completed by the relevant due dates.	Review has been completed and internal automatic notifications updated.	Complete
NC REC 3	Update appropriate contingency plan sections of management plans to include major spill events.	SERP updated on the 10/05/22. The SERP details controls for all spill events not just 'Major'.	Complete
NC REC 4	Clarify procedure for determining when works can re-commence, and assessment of the consistency of any new Aboriginal heritage impacts against the approved impacts of the SSI, and registering of any new site(s) in the AHIMS database.	<p>The New Finds Procedures details the required notification and reporting process. It specifies that an Archaeologist will be engaged, and mitigation measures developed in consultation with Aboriginal parties.</p> <p>A defined process for recommencement of work etc. is not appropriate as actions and processes will be contextual to the nature of the discovery.</p>	Complete
IMP 3	It is recommended that ER approval of management plans include reference to the version approved.	As approved by the DPE an ER is not required to be engaged as part of the construction component of MP07_0171 MOD 2.	Noted
IMP 4	Ensure empty drums are stored in appropriately bunded areas.	Empty drums observed as stored appropriately during the February 2023 audit.	Complete
IMP 5	<p>Review management plans to ensure:</p> <ul style="list-style-type: none"> • A reference table referring to consent conditions is included; • Where conditions are not addressed, include justification as to why; • Cross references in management plans are correct; • All Appendixes are attached to management plans published on the website; • Full names of acronyms used in the report are included; • Other management plans are correctly referenced within the document; 	<p>CEMPs approved in September 2022.</p> <p>OEMP reviewed and due for submission in March 2023.</p>	Ongoing

Rec #	Recommendation	Comment	Status
	<ul style="list-style-type: none"> A full reference list is included in every Management Plan; and Document control including version and date is consistent throughout. 		
IMP 6	Some areas of legacy waste were identified at the site which are recommended for removal.	Head walls have been removed with waste tyres pending removal in 2023.	Ongoing

3.0 Surface and Groundwater Monitoring

3.1 Legislative Context

Aurizon is required to undertake surface and groundwater monitoring of the project site during construction and for three years following commencement of the Site's operation in compliance with Condition C19 of the Approval and the approved Hexham Surface and Groundwater Monitoring Plan (**SGMP**).

3.2 Monitoring Network

Surface and groundwater monitoring locations and monitoring frequencies are detailed in Table 7 below with a site layout showing monitoring locations included as Figure 3.

Table 7 - Monitoring Network and Program

Site	Type	Easting	Northing	Monitoring Frequency
MW01R	Groundwater	377080	6365705	Quarterly
MW301R	Groundwater	376564	6367446	Quarterly
MW302R	Groundwater	376918	6366499	Quarterly
MW307R	Groundwater	376287	6366363	Quarterly
MW308R	Groundwater	376405	6365896	Quarterly
MW109	Groundwater	376273	6368095	Quarterly
MW106R	Groundwater	376758	6366928	Quarterly
MW02	Groundwater	376711	6365816	Quarterly
101R	Groundwater	377110	6365956	Quarterly
MW108R	Groundwater	376083	6366960	Quarterly
MW101R	Groundwater	376282	6367404	Quarterly
SW1	Surface Water	376210	6368225	Quarterly

Site	Type	Easting	Northing	Monitoring Frequency
SW2	Surface Water	375612	6368068	Quarterly
SW3	Surface Water	375884	6367384	Quarterly
SW4	Surface Water	376197	6366571	Quarterly
SW4A	Surface Water	376222	6366553	Quarterly
SW05	Surface Water	377144	6365655	Quarterly
SW6	Surface Water	376411	6365873	Quarterly
SW07	Surface Water	376680	6365799	Quarterly
SW8	Surface Water	377474	6365420	Quarterly
SW9	Surface Water	377496	6365387	Quarterly
SW10	Surface Water	376776	6367600	Quarterly
SW11	Surface Water	375433	6367878	Quarterly
Basin 1	Surface Water	376205	6367977	Monthly
Basin 2	Surface Water	376481	6367284	Monthly
Basin 3	Surface Water	377038	6365758	Monthly



Figure 3 - Surface and Groundwater Monitoring Locations

3.3 Meteorology

Rainfall data was assessed from Hexham Bridge (Manly Hydraulics Lab), which is considered to be representative in relation to its proximity to the site, as summarised in Figure 4.

Hexham Bridge station recorded a total annual rainfall of 1389.5 mm for 2022, which was higher than the previous year's total of 1114 mm.

As per the SGMP, greater than 75 mm of rainfall over a period of five consecutive days is a considered significant rainfall event and triggers the requirement for surface water monitoring. Rainfall is tracked via the MHL website (www.mhl.nsw.gov.au/Station-210448) which provides live records for a 5 day period only. Based on this tracking, five significant rainfall events were recorded in 2022, resulting in subsequent surface water monitoring being conducted on 09 March, 29 March, 30 May, 6 July and 11 October.

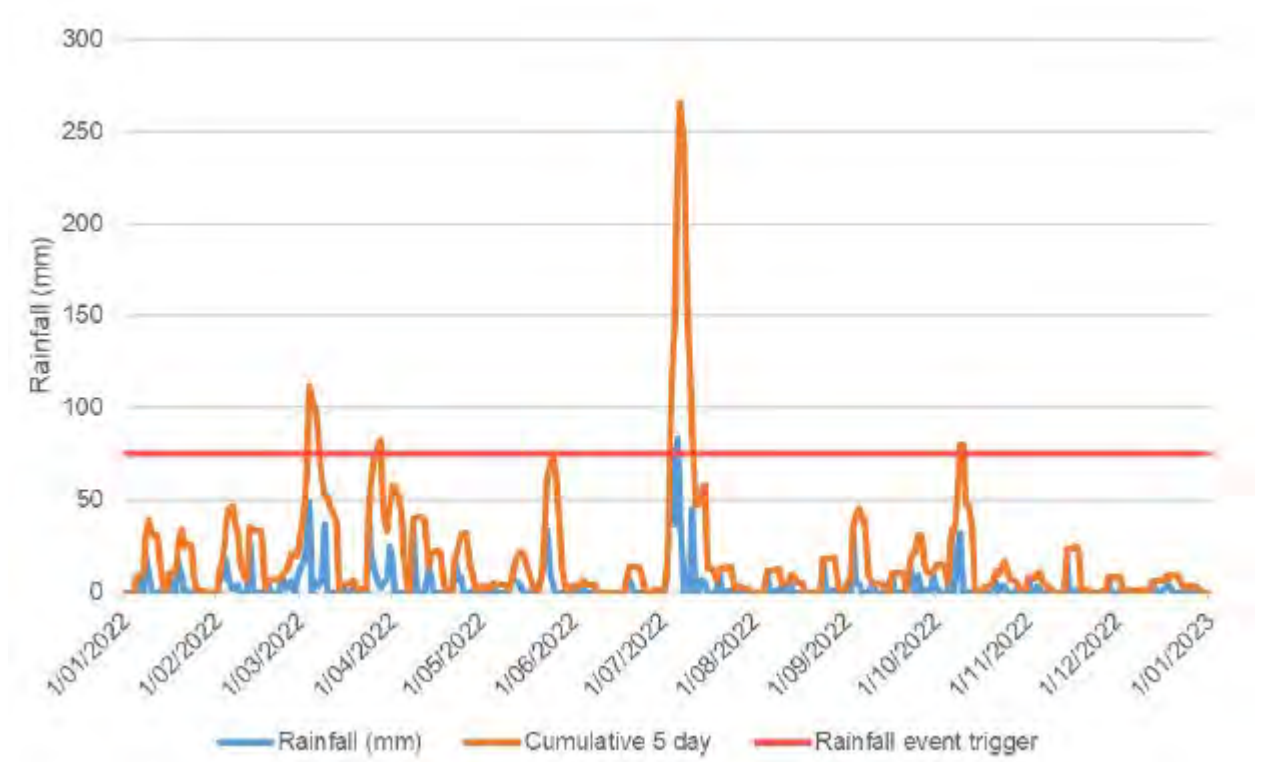


Figure 4 - Annual Rainfall Summary – Hexham Bridge (Station 210448)

3.4 Results

Surface and groundwater monitoring was undertaken in general accordance with the SGMP. Five rainfall monitoring events were triggered due rainfall events (when rainfall >75 mm over a period of 5 days). A summary of the compliance summary for water monitoring is detailed in Table 8 below.

Table 8 - Surface and Groundwater Scheduled Monitoring Compliance Summary

Monitoring	Parameters	Frequency	Compliance	Compliance
Surface water monitoring SW1 to SW11	Field analytes	Quarterly and rainfall events	No	<p>Turbidity readings for all monitored SW sites for the 9 March, 29 March, 7 April monitoring events, and the 30 May rainfall monitoring event were obtained from the laboratory as readings for turbidity in the field could not be taken with the supplied water quality meter.</p> <p>DO was not measured during the 11 October rainfall event for SW1, SW3, SW4, SW4A, SW5, SW6, SW7 and SW11 as the measured result was gauged beyond the calibrated range of the field meter, therefore a laboratory DO reading was adopted for these locations.</p>
	Laboratory analytes	Quarterly and rainfall events	Yes	
Water quality control basins 1 - 3	Field analytes	Monthly	No	<p>Turbidity readings for all monitored basins for the 9 March, 29 March, 7 April monitoring events, and the 30 May rainfall monitoring event were obtained from the laboratory as readings for turbidity in the field could not be taken with the supplied water quality meter.</p> <p>Field parameters² were not gauged for Basin 3 during the 7 April quarterly monitoring event (the second part of the March quarterly monitoring event) as the water quality meter received water damage on site during heavy rainfall.</p> <p>DO was not measured during the 11 October rainfall event (for Basin 1, Basin 2, Basin 3) as the measured result was gauged beyond the calibrated range of the field meter, therefore a laboratory DO reading was adopted for these locations.</p>
	Laboratory analytes	Quarterly and Rainfall	Yes	
Groundwater monitoring	Field analytes	Quarterly	No	<p>Field parameters² were not gauged for MW308R and MW108R during the 7 April quarterly monitoring event (the second part of the March quarterly monitoring event) as the water quality meter received water damage on site during heavy rainfall.</p> <p>DO was not measured for MW01R, MW02, MW307R and MW308R during the 1 September quarterly monitoring</p>

Monitoring	Parameters	Frequency	Compliance	Compliance
				event as the measured result was gauged beyond the calibrated range of the field meter, therefore a laboratory DO reading was adopted for these locations.
	Laboratory analytes	Quarterly	Yes	
	Depth	Quarterly	Yes	

A complete annual record of field parameters, analytical results including exceedances and data trends displayed in time series graphs is presented in Appendix A – Hexham TSF Annual Water Monitoring Report 2022.

A summary of the key results for the 2022 monitoring period are detailed in Sections 3.4.1 and 3.4.2 below.

3.4.1 Surface Water

Based on the field observations and lab results reported between 01 January and 31 December 2022, the following key findings relating to surface water are noted:

- Field pH ranged within the adopted assessment criteria between 5.4 to 7.9 pH units, at all locations except for SW1 and SW7, which recorded pH values of 6.4 and 5.4 during the 6 July and 11 October events, respectively. Both pH exceedances (below the adopted criteria) were within historical ranges. These results were not replicated during the subsequent monitoring events, which reported pH values within the adopted assessment criteria at both monitoring locations.
- Field EC ranged from 5.8 to 26254 µS/cm (fresh to saline) during 2022. Concentrations were below the adopted assessment criteria at all monitoring locations and generally consistent with those reported for the previous year (2021), with some select locations recording concentrations outside of historical ranges, which appeared to be isolated, returning to historical levels during the subsequent event.
- Laboratory turbidity and total suspended solid (TSS) concentrations varied without trend throughout 2022 at several locations and intermittently exceeded assessment criteria, with the exception of repeated exceedances at SW4, SW4A and SW5 generally consistent with historical records. The presence of livestock proximal to sampling points and the influence of rainfall are considered possible causes for the fluctuation (e.g., concentration spikes occurring following significant rainfall).
- Iron concentrations were above Site assessment criteria at surface water locations SW4, SW4A, SW5, SW6, SW7, and Basins 1, 2, and 3 throughout 2022, with locations Basin 1, Basin 2, SW4, SW4A, SW5, and SW6 recording their highest levels of total iron to date. The concentrations at these locations fell in subsequent sampling events, with the exception of Basin 1 which recorded its maximum during December 2022. Iron concentrations reported at Basin 3, SW4, SW4A, SW5, SW6 and SW7 have generally exceeded the adopted site assessment criteria in recent years and show some increasing trends.
- Most metal concentrations were generally consistent with historical records. Exceedances of several heavy metals including aluminium, copper, lead, nickel and zinc at SW5 and Basin 1 and

lead at SW3 and SW7, have shown increasing trends since 2020. These exceedances are likely related to high TSS and turbidity.

- Nitrogen concentrations were generally below the Site assessment criteria except for an isolated spike recorded at SW1 (Q3 monitoring event), and sporadic exceedances at SW4, SW4A, SW5, Basin 1 and Basin 2. Exceedances occurred in continuation to 2021 records, largely stabilising at most locations with the exception of Basin 1. These exceedances typically coincided with increased rainfall at the SW locations, but not generally at basin locations. Concentrations will continue to be reviewed in 2023 to ascertain whether increased concentrations continue at Basin 1.
- Concentrations of BTEXN and PAHs were below the Site assessment criteria and/or the laboratory LOR at all surface water monitoring locations during 2022, consistent with historical data.
- Some detections of TRH fractions were noted at SW1, SW2, SW3, SW5, SW7, SW11, and all three basins, consistent with historical intermittent detections. There are no assessment criteria for TRH fractions. No increasing trends are apparent.
- Thermotolerant coliform concentrations during 2022 were generally consistent with historical records. Isolated spikes were recorded at Basin 2 and SW3 (7700 cfu/100 mL), SW4 (12000 and 17000 cfu/100mL) and SW4A (14000 and 9000 cfu/100mL) which may reflect influence from adjacent agricultural areas (i.e., faecal matter from livestock). Concentrations at location SW4A, Basin 1 and Basin 3 appear to be increasing and will continue to be monitored in 2023.

3.4.2 Groundwater

Based on the field observations and results reported between 01 January and 31 December 2022, the following key groundwater findings are noted:

- Field pH ranged 5.0 to 7.9 pH units during 2022. Exceedances of the DCC (below the adopted criteria) were reported at MW01R (5.0 pH units) during the 3Q event, and at MW02 (ranging from 5.0 to 5.3 pH units) during Q1, Q2 and Q3. The low pH value recorded outside of the DCC at MW01R was within historical ranges and does not reflect a worsening trend. The pH value measured during the Q3 event at MW02 (5.0 pH units) was slightly lower than historical levels but returned to within historical ranges during the Q4 event.
- Field EC ranged 304.1 to 32,001 $\mu\text{S}/\text{cm}$ (fresh to saline) during 2022. EC was below the adopted assessment criteria at all monitoring locations except MW307R during all four quarterly events (ranging 22,034 to 32,001 $\mu\text{S}/\text{cm}$) and MW101R during Q2 (24, 833 $\mu\text{S}/\text{cm}$). Exceedances at MW307R continue an increasing trend observed since June 2020; however, concentrations significantly increased throughout 2022. MW101R has shown isolated exceedances without trend since June 2019. Turbidity and TSS concentrations were below the DCC at all locations, except for an isolated spike in TSS, within the historical range, at MW109 in Q4.
- Exceedances of aluminium, cadmium and copper were observed at select monitoring wells throughout 2022; however, concentrations remained low and stable and within historical ranges, with the exception of the low detection of cadmium at MW308R which was slightly above the LOR in Q3, however dropped below the LOR in Q4.
- Arsenic concentrations at MW02 exceeded the DCC in Q1 (0.015 mg/L), Q2 (0.014 mg/L) and Q4 (0.014 mg/L) but remained within historical ranges. Arsenic at this location has shown a stabilised trend in 2022 and will be monitored in during 2023 to determine if this trend continues.
- Nitrogen concentrations at MW307R exceeded DCC criteria throughout all four quarterly events and have shown an increasing trend in 2022. Concentrations decreased slightly in Q4 but will continue to be monitored in 2023 to determine if concentrations continue to increase.

- Concentrations of BTEXN and PAHs were reported below site assessment criteria at all groundwater monitoring locations during 2022, consistent with historical records. An isolated detection of toluene occurred in MW106R in Q4) equal to the LOR (1 µg/L). Isolated detections of toluene have occurred previously across the Site; however, this was the first detection at MW106R since monitoring began and will be monitored in 2023 to assess if the result was anomalous.
- TRH (C10-C36) concentrations were below the DCC at all groundwater monitoring locations during 2022.
- Thermotolerant coliform concentrations remained similar to 2021. All detections were below assessment criteria with the exception of MW302R (4900 cfu/100mL) and MW109 (3100 cfu/100mL) during Q1. These concentration spikes are within historical ranges and are considered to result from increased runoff following a period of high rainfall.

4.0 Compliance

4.1 Compliance Summary

As per section 3.2.2 of the Guidelines the status of each compliance requirement applicable during the reporting period must be recorded by using the relevant descriptors in Table 9 below.

Table 9 - Compliance Status Descriptors

Status	Description
Compliant	The proponent has collected sufficient verifiable evidence to demonstrate that all elements of the requirement have been complied with.
Non-compliant	The proponent has identified a non-compliance with one or more elements of the requirement.
Not triggered	A requirement has an activation or timing trigger that has not been met at the phase of the development when the compliance assessment is undertaken, therefore an assessment of compliance is not relevant.

Compliance with Approval conditions for the reporting period 01 January 2022 – 31 December 2022 is summarised in Table 10 below and Appendix A.

Table 10 - Compliance Summary

Criteria	Status	Comments
Actions Audited	136	
Compliant	63	
Not Triggered	68	
Non-Compliant	5	Refer Appendix B and Section 4.2
Assigned Actions	1	Refer Section 2.4
Notifiable Incidents	0	
Community Complaints	0	

4.2 Non-Compliance

Five non-compliances with the conditions of the Approval were identified during the audit period. The non-compliance register has been incorporated as Appendix B and includes actions to address non-compliances.

Four of the non-compliances are due to Aurizon not undertaking a pre-construction report as the Compliance Reporting: Post Approval Requirements (DP&E, May 2020) guidelines were incorrectly adopted assuming they were an updated version of the Compliance Reporting Post Approval Requirements (Department of Planning, 2018). No environmental impact has occurred due to this error and moving forward the 2018 guidelines will be utilised for the duration of the Approval works.

A single non-compliance is due to a field water probe failing. Field analysis is used to provide indicative instantaneous value with all analytes confirmed with lab analysis. Failure of the field has negligible impact on the findings of conducted monitoring due to the completion of lab analysis. Regardless the engaged contractor continues to review its maintenance process to minimise the chance of reoccurrence.

4.3 Previous Report Actions

Previous OCR actions are detailed in Table 10 below.

Table 11 - Previous Report Actions

OCR	Action	Status
NIL		

4.4 Complaints

No complaints were received relating to the Site's environmental performance during the reporting period as per Table 11 below:

Table 12 - Complaints

ID	Stakeholder OCR ID	Complaint Date	Aurizon Response	Complaint Summary
NO COMPLAINTS RECEIVED DURING THE REPORTING PERIOD				

4.5 Notifiable Incidents

There were no reportable incidents during the reporting period.

4.6 Inspections and Audits

The following site inspections and audits were undertaken during the reporting period:

- Scheduled site inspections as required under the OEMP;
- Periodic site inspections by the Principal Advisor Environment and site personnel; and
- Finalisation of the independent audit as required by Condition D5 of MP07_0171 MOD 1.

APPENDICIES

APPENDIX A - Compliance Register

Reporting Period Relevant MP07_0171 MOD 1 Conditions Compliance Summary

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
B1	Terms of Approval	<p>The Proponent shall carry out the SSI generally in accordance with the:</p> <p>(a) Application MP 07_0171; (b) Environmental Assessment, NSW Train Support Facility, Maitland Road, Hexham (ADW Johnson Pty Limited, November 2012); (c) Preferred Project Report and Response to Submissions, NSW Train Support Facility, Maitland Road, Hexham (JBA, June 2013); (d) State Significant Infrastructure – Modification: Detailed Environmental Assessment Report, Maitland Road, Hexham (Ethos Urban, June 2019); (e) State Significant Infrastructure MP07_0171 Modification: Response to Submissions (Ethos Urban, August 2019); and (f) Depot Relocation Modification Assessment Report (Ethos Urban, April 2022); (g) Hexham Long Term Train Stabling Facility Modification 2 (SSI-6090-Mod-2) – Response to Submissions Report (h) Hexham Long Term Train Stabling Facility Modification 2 (SSI-6090-Mod-2) – Revised Modification Plans</p>	Compliant	Ongoing
B2	Terms of Approval	<p>In the event of an inconsistency between:</p> <p>(a) the conditions of this approval and any document listed from condition B1(a) to B1(i) inclusive, the conditions of this approval shall prevail to the extent of the inconsistency; (b) any document listed from condition B1(a) to B1(i) inclusive, the most recent document shall prevail to the extent of the inconsistency.</p>	Not Triggered	
B3	Terms of Approval	<p>The Proponent shall comply with any reasonable requirement(s) of the Director General arising from the Department's assessment of:</p> <p>(a) any reports, plans or correspondence that are submitted in accordance with this approval; and (b) the implementation of any actions or measures contained within these reports, plans or correspondence.</p>	Compliant	Ongoing
B4	Terms of Approval	Subject to confidentiality, the Proponent shall make all documents required under this approval available for public inspection on request.	Not Triggered	Ongoing
B4(a)	Terms of Approval	The following Conditions of Approval do not apply to the Turning Angle Works: B5, C3, C16, C18, C22, C23, C33, C34, C35, C38, C39, E1, E5, E13, E14, E15, E16, E17, E24, E25, E26, E30, E32, E36, E42, E43, E44, E49, E59, E60, and F3.	Not Triggered	Ongoing
B4(b)	Terms of Approval	Any references to entities listed in column A are to be interpreted as entities in column B throughout the approval:	Not Triggered	
B5	Limits of Approval	This approval shall lapse 10 years after the date on which it is granted, unless works that are the subject of this SSI approval are physically commenced on or before that date.	Not Triggered	

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
B6	Statutory Requirements	The Proponent shall ensure that all necessary licences, permits and approvals required for the development of the SSI are obtained and maintained as required throughout the life of the SSI. No condition of this approval removes the obligation for the Proponent to obtain, renew or comply with such necessary licences, permits or approvals.	Compliant	1/09/2022
B7	Statutory Requirements	Any changes to the scope of the SSI activity shall be subject to a consistency review. Should the review identify activity scope and environmental impacts inconsistent with the assessed SSI activity, a modification to the Infrastructure Approval will be required.	Not triggered	Ongoing
B8	Staging	The SSI may be constructed and operated in stages. Where staged construction or operation is proposed, a Staging Report (for either or both construction and operation as the case may be) must be prepared and submitted to the Planning Secretary no later than one month before the commencement of construction of the first of the proposed changes of construction (or if only staged operation is proposed, one month before the commencement of operation of the first of the proposed stages of operation).	Not triggered	N/A
B9	Staging	<p>The Staging Report must:</p> <p>(a) if staged construction is proposed, set out how the construction of the whole of the SSI will be staged, including details of work and other activities to be carried out in each stage and the general timing of when construction of each stage will commence and finish;</p> <p>(b) if staged operation is proposed, set out how the operation of the whole of the SSI will be staged, including details of work and other activities to be carried out in each stage and the general timing of when operation of each stage will commence and finish (if relevant);</p> <p>(c) specify how compliance with conditions will be achieved across and between each of the stages of the SSI; and</p> <p>(d) set out mechanisms for managing any cumulative impacts arising from the proposed staging.</p>	Not triggered	N/A
B10	Staging	The SSI must be staged in accordance with the Staging Report, as submitted to the Planning Secretary.	Not triggered	N/A
B10A	Staging	Where staging is proposed, the terms of this approval that apply or are relevant to the works or activities to be carried out in a specific stage must be complied with at the relevant time for that stage.	Not triggered	N/A
B11	Compliance	The Proponent shall ensure that employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.	Compliant	Ongoing
B12	Compliance	The Proponent shall be responsible for environmental impacts resulting from the actions of all persons that it invites onto the site, including contractors, sub-contractors and visitors.	Compliant	Ongoing

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
B13	Compliance	In the event of a dispute between the Proponent and a public authority in relation to an applicable requirement in this approval or relevant matter relating to the SSI, either party may refer the matter to the Director-General for resolution. The Director General's determination of any such dispute shall be final and binding on the parties.	Not Triggered	Ongoing
C1	Operational Noise and Vibration	The SSI shall be designed and operated with the objective of not exceeding the vibration goals for human exposure for existing sensitive receivers, as presented in Assessing Vibration: a Technical Guideline (DECC, 2006).	Compliant	Ongoing
C2		The Proponent shall ensure that the SSI is designed and operated so as not to exceed the operational noise limits presented in Table 1 at the nominated receivers. Refer Table 1 for noise limits.	Compliant	Ongoing
C3	Ecological Monitoring	<p>C3. Prior to the commencement of construction work that would result in the disturbance of any native vegetation, threatened flora and fauna or endangered ecological communities (EECs) and their habitats, the Proponent shall develop an Ecological Monitoring Program to monitor the effectiveness of the biodiversity mitigation measures implemented as part of the SSI. The Program shall be developed by a suitably qualified and experienced ecologist in consultation with the OEH. The Program shall include, but not necessarily be limited to:</p> <p>(a) an adaptive monitoring program to assess the effectiveness of the mitigation measures identified in conditions E3, E4, E5, E7, E8, E9, E10, E11, E12 and E63 (b) and allow amendment to the measures if necessary;</p> <p>(b) monitoring and/or assessment measures for assessing changes in groundwater dependent ecosystems, including impact assessment criteria;</p> <p>(c) identification of appropriate and justified monitoring periods and performance targets against which effectiveness of the mitigation measures will be measured;</p> <p>(d) provision for the assessment of data to identify changes to habitat usage and groundwater dependent ecosystems and if this can be attributed to the SSI activity;</p> <p>(e) details of contingency measures that would be implemented in the event of any exceedence of water quality thresholds which would be injurious to biotic systems and/or species, or changes to the structure and composition of groundwater dependent ecosystems which are directly attributable to the construction or operation of the SSI activity;</p> <p>(f) monitoring protocols for the Hunter Wetland National Park;</p> <p>(g) monitoring protocols for Saltmarsh endangered ecological community and Freshwater Wetland ecological community;</p> <p>(h) monitoring protocols for habitat conditions that support the Green and Golden Bell Frog;</p>	Not Triggered	19/03/2019
C3 (continued)	Ecological Monitoring	<p>(i) mechanisms for developing additional monitoring protocols to assess the effectiveness of any additional mitigation measures implemented to address additional impacts in the case of design amendments or unexpected threatened species finds during construction (where these changes are generally consistent with the biodiversity impacts identified for the SSI in the documents listed under conditions B1 (a) and B1 (c) inclusive; and</p> <p>(j) provision for annual reporting of monitoring results to the Director-General and the OEH, or as otherwise agreed by the Director-General and the OEH.</p> <p>Monitoring shall be undertaken during construction (for construction-related impacts) and upon operation of the SSI (for operation/ongoing impacts) until such time as the effectiveness of mitigation measures can be demonstrated to have been achieved over a minimum of three successive monitoring periods after the commencement of operation, or as otherwise agreed by the Director-General.</p>	Not Triggered	19/03/2019

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
C4	Biodiversity Offsets	<p>In the event that the extent, type or condition of native vegetation communities or flora and fauna habitat are to be lost or degraded as a result of the SSI varies to that described in the documents referred to in condition B1, or as otherwise agreed to by the Planning Secretary, the Proponent shall develop and submit a Biodiversity Offset Package for the approval of the Planning Secretary within 12 months of the commencement of construction. The Package shall detail how the ecological values lost as a result of the SSI will be offset. The Package shall be developed in consultation with the EESG and the Hunter LLS and shall include, but not necessarily be limited to:</p> <p>(a) the objectives and biodiversity outcomes to be achieved;</p> <p>(b) confirmation of the extent (in hectares), types and condition of the native vegetation communities (including SEPP 14 wetlands) and flora and fauna habitat to be lost or degraded as a result of the final design of the SSI, including consideration of the indirect impacts on adjacent retained vegetation and impacts caused through weed invasion, hydrological changes and potential edge effects;</p> <p>(c) a process for addressing and incorporating offset measures arising from changes in biodiversity impacts (where these changes are generally consistent with the biodiversity impacts identified for the SSI in the documents listed under condition B1 inclusive from –</p> <ul style="list-style-type: none"> (i) changes to the footprint due to design changes, (ii) changes to predicted impacts as a result of changes to mitigation measures, and (iii) identification of additional species/specimens and/or habitat during pre- clearing surveys, construction or the establishment of ancillary facilities); <p>(d) a statement of the methodology used to determine the offsets required;</p> <p>(e) details of the final suite of the biodiversity offset measures selected and secured with consideration of the Biodiversity Offset Strategy (as set out in Appendix G of the document referred to in condition B1 (c);</p> <p>(f) justification for the application of any Tier 2 and Tier 3 outcomes;</p> <p>(g) the final selected means of securing the biodiversity values of the offset package in perpetuity;</p>	Compliant	1/10/2016
C4 (continued)	Biodiversity Offsets	<p>(h) the management and monitoring requirements for compensatory habitat works (excluding biobanking sites) and other biodiversity offset measures proposed to ensure the outcomes of the Package are achieved including -</p> <ul style="list-style-type: none"> (i) the monitoring of the condition of species and ecological communities at offset locations (excluding biobanking sites), (ii) the methodology for the monitoring program(s), including the number and location of offset monitoring sites and the sampling frequency at these sites, and (iii) provisions for annual reporting of the monitoring results for a specified period of time as determined in consultation with the EESG; and <p>(i) timing and responsibilities for the implementation of the provisions of the Package.</p> <p>Land offsets shall be consistent with the Principles for the Use of Biodiversity Offsets in NSW and the Interim Policy on Assessing and Offsetting Biodiversity Impacts of Part 3A, State Significant Development (SSD) and State Significant Infrastructure (SSI) Projects (OEH, 2011). Any land offset shall be enduring and be secured by a conservation mechanism which protects and manages the land in perpetuity. Where land offsets cannot solely achieve compensation for the loss of affected biodiversity, additional measures shall be provided to collectively deliver a biodiversity offset in accordance with the Interim Policy on Assessing and Offsetting Biodiversity Impacts of Part 3A, State Significant Development (SSD) and State Significant Infrastructure (SSI) Projects (OEH, 2011) and to provide a positive biodiversity outcome for the region.</p> <p>Where possible, priority shall be given to securing offset sites as near to the location of the impact/loss as possible to assist with the preservation of the specific endemic community of the area and assure that the ecological and amenity benefits of retaining endemic vegetation remain within the locality. Should a conservation agreement under the National Parks and Wildlife Act 1974 not be considered a viable alternative, then the Proponent must ensure that any offset arrangement it enters into must provide a provision for in-perpetuity conservation title on the land and a monetary contribution sufficient to carry out rehabilitation and monitoring actions pursuant to this consent and any actions outlined under a Vegetation Management Plan. This may be the subject of a Planning Agreement within the meaning of section 93F of the Environmental Planning and Assessment Act 1979. Upon execution of the Planning Agreement, or other conservation mechanism to the satisfaction of the EESG, the Proponent shall inform the Secretary on the outcomes of such an agreement.</p> <p>Should updates to the Nest Box Plan be required in accordance with condition E7, updates shall be undertaken in consultation with EESG.</p>	Compliant	1/10/2016

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
C5	Biodiversity Offsets	The Proponent shall ensure that groundwater dependent ecosystems outside the project footprint are not adversely affected by the design, construction and operation of the SSI.	Compliant	Ongoing
C6	Hydrology	Except as may be provided by an EPL, the SSI shall be constructed and operated to comply with section 120 of the Protection of the Environment Operations Act 1997 which prohibits the pollution of waters.	Compliant	Ongoing
C7	Stormwater Management	The SSI shall be designed, and employ surface water management techniques, such that runoff volumes, rates and pollutant loads are maintained as far as practicable to pre-construction levels and there are no adverse effects to adjoining lands as a result of runoff. The stormwater design shall be undertaken in consultation with the OEH and City of Newcastle and shall have consideration of the Newcastle Development Control Plan 2012.	Compliant	1/09/2022
C8	Stormwater Management	The SSI shall be designed and constructed to incorporate operational stormwater management measures, including (but not limited to): (a) areas of high sediment, areas of storage and use of oil and grease and areas containing nutrient loads (including the wash bays, provisioning sheds and servicing sheds) shall be separated from the general site stormwater system through the use of separate drainage systems, bunds and hardstands and subject to separate discharge to trade waste or re-use in the wash down bays; (b) where connection to the reticulated sewer system is identified to not be feasible, subject to justification based on further investigations, wastewater from the administration buildings, toilets, showers, lunch rooms, etc. shall be managed through a water treatment plant and be disposed via irrigation into existing agricultural pasture land. (c) site stormwater shall be directed into a drain on the western boundary of the SSI site and directed into one of three stormwater detention basins for treatment of suspended sediments and nutrients through floating wetlands, prior to its offsite discharge. This stormwater system shall be capable of treating at least a 1 % AEP stormwater event; and (d) access roads shall be provided with road side swales to provide treatment through flow attenuation and entrainment of suspended sediments.	Compliant	1/09/2022

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
C9		<p>Prior to the commencement of construction, the Proponent shall, in consultation with the Water Group and EESG, prepare a Stormwater Management Plan and submit the plan for the approval for the Planning Secretary at least one month prior to the commencement of construction of the SSI. The Plan shall include but not necessarily be limited to:</p> <p>(a) final details of operational stormwater management measures to be implemented for the SSI based on detailed design, including identification of offsite discharge locations;</p> <p>(b) if required, identification of the water quality standards to which wastewater from the wastewater treatment plant would be treated to prior to its irrigation. The plan shall demonstrate that the water quality criteria to which the waste water would be treated to is suitable for irrigation purposes based on the land capability of the irrigation site (including nutrient loads, pH and salinity), considering existing baseline conditions and cumulative inputs from other irrigation sources to the site;</p> <p>(c) identification of the water quality standards to which stormwater from the three stormwater detention basins would be treated to prior to offsite discharge with consideration of the receiving environment and relevant water quality standards such as Managing Urban Stormwater: Environmental Targets (DECC & CMA, October 2007); and</p> <p>(d) monitoring, review and maintenance procedures to assess and maintain the operational stormwater integrity and performance of the SSI consistent with the requirements of condition C19.</p> <p>Nothing in this condition precludes the Proponent from updating the Stormwater Management Plan presented in Appendix E (Stormwater Management Plan) or the document referred to in condition C19 to meet the requirements of this condition.</p> <p>Prior to construction of the Turning Angle Works, the Proponent must provide a copy of the revised plan including the Turning Angle Works to the Environmental Representative for approval. The ER may approve minor updates to the plan without further consultation with public authorities.</p>	Compliant	21/10/2022
C10	Groundwater	Excavation activities near the Hexham Swamp Nature Reserve shall be undertaken in a manner which prevents the drawdown of groundwater within the Nature Reserve to a level which results in desaturation of acid sulfate soils within the Nature Reserve.	Not Triggered	Ongoing
C11	Groundwater	All drainage structures, including but not limited to pits, pipes, cess drains, sediment basins and detention basins, shall be designed and constructed so as to minimise long term connection with groundwater. The stormwater system components, including but not limited to detention basins and floating wetlands, shall be designed and constructed to ensure that there is no permanent interception of, and/or connection with groundwater.	Compliant	1/02/2023
C12	Flooding	The SSI shall be designed and constructed so that it does not result in flooding impacts greater than those predicted in the documents referred to in condition B1. The cumulative impacts of the SSI and the proposed ARTC Hexham Relief Roads shall be considered in these requirements.	Compliant	18/03/2022
C13	Flooding	All buildings or structures below the 10% AEP level shall be constructed of flood compatible materials.	Compliant	18/03/2022
C14	Flooding	Electrical supply and signalling locations associated with the operation of the SSI shall be elevated above the 1 % AEP flood level and include a free board of 250 millimetres.	Compliant	28/02/2023

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
C15	Flooding	<p>The Proponent shall prepare a Flood Emergency Management Plan which sets out the management requirements and procedures for managing flood risks during the construction and operation of the SSI, including flood recovery measures. The Plan shall be prepared in consultation with City of Newcastle and the EESG and be submitted to the Planning Secretary at least one month prior to the commencement of construction, or as otherwise agreed by the Planning Secretary.</p> <p>Prior to construction of the Turning Angle Works, the Proponent must provide a copy of the revised plan including the Turning Angle Works to the Environmental Representative for approval. The ER may approve minor updates to the plan without further consultation with public authorities.</p>	Compliant	21/10/2022
C16	Flooding	<p>Within 12 months of the commencement of construction, or as otherwise agreed by the Director-General, the Proponent shall consult with the landowner of Lot 100, DP 1044020, to develop feasible and reasonable measures for managing and/or mitigating flood impacts associated with the construction of the SSI to the residence located on the property. The Proponent shall forward a statement of agreed measures, including a timetable for implementation, to the Director-General within one month of reaching an agreement with the landowner. If there is a dispute regarding the proposed flood management measures, either party may refer the matter to the Director-General for resolution whose decision shall be final.</p>	Not Triggered	1/02/2017
C17	Watercourse Crossing	<p>All temporary and permanent watercourse crossings shall be designed in consultation with the NoW, and with the DPI (Aquaculture and Fisheries) where the crossing has the potential to impact on fish passage. Where feasible and reasonable, the crossings shall be consistent with the NoW's Guidelines for Controlled Activities and Policy and Guidelines for Fish Friendly Waterway Crossings (NSW Fisheries, 2004) and Policy for and Guidelines for Design and Construction of Bridges, Roads, Causeways, Culverts and Similar Structures (NSW Fisheries, 1999).</p>	Not Triggered	20/02/2014
C18	Watercourse Crossing	<p>The Proponent shall ensure that the upgrade of the Purgatory and Middle Creek crossings are designed to provide an equivalent hydraulic capacity to the existing culverts, not reduce the existing waterway area and to withstand heavy vehicle movements associated with the construction and operation of the SSI. The Proponent shall liaise with the City of Newcastle and the DPI in regards to the design and construction of the crossings.</p>	Not Triggered	20/02/2014

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
C19	Surface and Groundwater Monitoring Program	<p>A Surface Water and Groundwater Monitoring Program shall be prepared and implemented to monitor impacts on surface water and groundwater quality and hydrology. The Program shall be developed in consultation with the EPA, the Water Group and Hunter LLS and shall include, but not necessarily be limited to:</p> <p>(a) identification of works and activities during construction of the SSI, including emergencies and spill events, that have the potential to impact on surface and groundwater water quality and groundwater depths and flows;</p> <p>(b) identification of surface and groundwater monitoring locations which are representative of the potential extent of impacts from the construction and operation of the SSI on water quality and groundwater depths and flows (including watercourses, waterbodies, wetlands, drainage swales and licensed discharge points);</p> <p>(c) a description of the parameters (including physico-chemical) and standards against which any changes to water quality will be monitored and assessed, having regard to the principles of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (ANZECC, 2000);</p> <p>(d) details of representative background monitoring of surface and groundwater quality parameters and groundwater depths and flows undertaken to date (or required to be undertaken) to establish baseline conditions;</p> <p>(e) identification of 'trigger points' for further investigation or action to be taken;</p> <p>(f) identification of the frequency and methodology of monitoring during background, construction and operation monitoring periods;</p> <p>(g) details on how the results of monitoring would be recorded;</p> <p>(h) details of how interactions with the ARTC Hexham Relief Roads Project and potential cumulative impacts would be monitored and managed;</p> <p>(i) contingency and ameliorative measures in the event that adverse impacts to surface waters and groundwater are identified consequent to the construction and/or operation of the SSI; and</p> <p>(j) methodology for reporting of the monitoring results to the Department and EPA.</p> <p>Monitoring shall be undertaken in accordance with the requirements of the approved Construction Soil and Water Management Plan required under Condition E63(d) and Operation Environment Management Plan required by condition F2.</p> <p>The Program shall be submitted to the Planning Secretary for approval at least one month prior to the commencement of construction of the SSI, or as otherwise agreed by the Planning Secretary.</p> <p>Prior to construction of the Turning Angle Works, the Proponent must provide a copy of the revised plan including the Turning Angle Works to the Environmental Representative for approval. The ER may approve minor updates to the plan without further consultation with public authorities.</p>	Non-Compliant	Ongoing
C20	Acid Sulphate Soils	The Proponent shall ensure that all acid sulfate soils and acid generating material excavated on site is disposed offsite in an appropriately licensed landfill facility, unless proposed to be re-used on site. Any acid sulphate soils or acid generating material to be re-used on site shall be temporarily stored and treated on site to required standards in an appropriately lined and bunded storage area located above the 1 % AEP flood level. Procedures for the treatment, temporary storage and monitoring of these materials shall be in accordance with the Acid Sulfate Soil Management Plan required to be prepared under condition E63 (d) (xi) of this approval.	Not Triggered	28/02/2023
C21	Acid Sulphate Soils	No acid sulfate soils or acid generating material shall be permanently stored on site, unless the material has been treated and validated as neutralised and the material is stored above the 1 % AEP flood level and protected by appropriate erosion and sediment control measures, and as agreed to by the EPA and the Director-General.	Not Triggered	28/02/2022
C22	Aboriginal Heritage	Prior to the commencement of construction the Proponent shall liaise with Registered Aboriginal Stakeholders on the conclusions and recommendations of the revised heritage assessments presented in Appendices J and K of the document referred to in condition B1 (c) of this approval, in relation to the sites identified as HS1 and HS2. Prior to the commencement of construction the Proponent shall submit evidence to the Director-General and OEH that the final mitigation approach for sites HS1 and HS2 (including opportunity for salvage or agreement that no further mitigation is required) has been determined in consultation with Registered Aboriginal Stakeholders.	Not Triggered	28/02/2022

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
C23	Historic Heritage	<p>Prior to the commencement of pre-construction and construction activities in the vicinity of the junction of the Minmi to Hexham Railway and the Great Northern Railway, the Proponent shall prepare an Archaeological Assessment in accordance with the Heritage Council's Archaeological Assessments Guideline (1996). Should the assessment identify areas of potential archaeological resources, the Proponent shall further:</p> <p>(a) prepare a Historic archaeological investigation program using a methodology prepared in consultation with the OEH (Heritage Branch), and to the satisfaction of the Director-General. This work should be undertaken by an archaeological heritage consultant as agreed by the Heritage Branch and approved by the Director-General. The nomination for the Excavation Director shall demonstrate ability to comply with the Heritage Council's Criteria for the Assessment of Excavation Directors (July 2011);</p> <p>(b) report on the results of the Historic archaeological investigation program, including recommendations (such as for further archaeological work), in consultation with the Heritage Branch and to the satisfaction of the Director-General, and shall include, but not necessarily be limited to:</p> <p>(i) consideration of measures to avoid or minimise disturbance to archaeology, where archaeology of non-Aboriginal archaeological significance is found to be present, (ii) where impacts cannot be avoided, recommendations for any further investigations for archaeology of historical archaeological significance, and (iii) management and mitigation measures to ensure there are no additional impacts due to pre-construction and construction activities; and</p> <p>(c) undertake any further archaeological excavation works recommended by the results of the Historic archaeological investigation program.</p> <p>Within 12 months of completing the above work, unless otherwise agreed by the Director-General, the Proponent shall submit a report containing the findings of the excavations, including artefact analysis, and the identification of a final repository for finds, prepared in consultation with the Heritage Branch and to the satisfaction of the Director-General. A copy of the final report shall be submitted to the Heritage Council library.</p>	Not Triggered	14/01/2014 20/02/2014 20/02/2014 28/01/2015
C24	Hazards and Risks	<p>Dangerous goods, as defined by the Australian Dangerous Goods Code, shall be stored and handled strictly in accordance with:</p> <p>(a) all relevant Australian Standards; (b) for liquids, a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund; and (c) the Environment Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin (EPA, 1997).</p> <p>In the event of an inconsistency between the requirements listed from (a) to (c) above, the most stringent requirement shall prevail to the extent of the inconsistency.</p>	Compliant	Ongoing
C25	Waste Management	The Proponent shall ensure that all liquid and/or non-liquid waste generated on the site is assessed and classified in accordance with Waste Classification Guidelines (DECCW, 2009), or any future guideline that may supersede that document, and that it is appropriately handled.	Compliant	Ongoing
C26	Waste Management	The Proponent shall maximise the reuse and/or recycling of waste materials generated on site as far as practicable, to minimise the need for treatment or disposal of those materials off site.	Compliant	Ongoing
C27	Waste Management	The Proponent shall not cause, permit or allow any waste generated outside the site to be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste. This condition is independent of the operation of the Brancourts facility and Sewerage Treatment Plant.	Compliant	Ongoing
C28	Waste Management	All waste materials removed from the site shall be appropriately tracked and shall only be directed to a waste management facility or premises lawfully permitted to accept the materials.	Compliant	Ongoing

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
C29	Utilities and Services	<p>Utilities, services and other infrastructure potentially affected by construction of the SSI shall be identified prior to commencement of that part of construction which affects the item, to determine requirements for access to, diversion, protection, and/or support.</p> <p>Consultation with the relevant owner and/or provider of services that are likely to be affected by the SSI shall be undertaken to make suitable arrangements for access to, diversion, protection, and/or support of the affected infrastructure as required. The Proponent shall ensure that disruption to any service is minimised and shall be responsible for advising impacted service recipients prior to any planned disruption of service. The cost of any such arrangements shall be borne by the Proponent, unless otherwise agreed with the utility/service provider.</p>	Not triggered	8/04/2022
C30	Utilities and Services	Utilities, services and other infrastructure owners to be consulted shall include, but not be limited to, the Hunter Water Corporation, Jemena, Ausgrid, Optus and Brancourts.	Not triggered	20/02/2014
C31	Property and Business Impacts	Subject to agreement with the relevant property owner, any damage caused to property or infrastructure as a result of the SSI shall be rectified or the property owner compensated, within a reasonable timeframe, with the costs borne by the Proponent. This condition is not intended to limit any claims that the property owner may have against the Proponent.	Not triggered	Ongoing
C32	Access	The Proponent shall not affect or alter any existing access routes currently in place between the OEH (NPWS) and landowners to the Hexham Swamp Nature Reserve, unless otherwise agreed to by the NPWS and landowners.	Not triggered	31/10/2015
C33	Access	The Proponent shall provide a new private access track (consistent with that described in the document referred to in condition B1 (c) to service properties located to the west and south of the SSI. The private access track shall utilise existing track footprints where practical.	Not triggered	31/10/2015
C34	Access	The SSI shall be designed so as not to preclude future pedestrian access across the site from the Hexham Railway Station to future industrial uses on the adjoining site.	Compliant	1/09/2022
C35	Access	The SSI shall be designed and constructed with the objective of minimising adverse changes to existing access arrangements and services for other transport modes (including pedestrians and cyclists) and, where feasible and reasonable, facilitate an improved level of access and service to other transport modes comparable to the existing situation.	Compliant	28/02/2023
C36	Access	The SSI shall be designed to not preclude the location of identified future proposals, including the future Richmond Vale Rail Trail and the F3 Freeway to Raymond Terrace upgrade. In particular, any changes to the F3 Freeway to Raymond Terrace upgrade concept design, necessitated by the SSI, shall be at the Proponent's cost except where those changes are as a result of works outside of the F3 Freeway to Raymond Terrace footprint identified in B1.	Compliant	1/09/2022
C37	Lighting	The Proponent shall ensure, where practicable, that all external lighting associated with the construction and operation of the SSI is mounted, screened and directed in such a manner so as not to create nuisance to residences. The lighting shall be the minimum level of illumination necessary and shall comply with the Australian Standard AS 4282:1997 - Control of the Obtrusive Effects of Outdoor Lighting and relevant Australian Standards in the series AS/NZ 1158 - Lighting for Roads and Public Spaces.	Compliant	1/09/2022

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
C38	Landscapping	The Proponent shall undertake tree planting, where practicable, to screen views of the site from residences to the north and west of the site and from the viewpoints from the Pacific and New England Highways and the Hexham industrial/commercial area.	Not triggered	28/02/2022
C39	Community Contributions	The Proponent must ensure that any voluntary arrangement it enters into with the City of Newcastle, in relation to the provision of a monetary contribution or other material public benefit, which is to be applied to a public purpose, is the subject of a Planning Agreement within the meaning of section 93F of the EP&A Act. Upon execution of any Planning Agreement, the Proponent shall inform the Director-General on the outcomes of such an agreement.	Not triggered	18/01/2016
D1	Community Involvement	<p>The Proponent shall prepare and implement a Community Communication Strategy for the SSI. The Strategy shall be designed to provide mechanisms to facilitate communication between the Proponent (and its contractors), the Environmental Representative, City of Newcastle and the local community (broader and local stakeholders) on the detailed design, construction and environmental management of the SSI. The Strategy shall include, but not necessarily be limited to:</p> <p>(a) identification of stakeholders to be consulted as part of the Strategy, including affected and adjoining landowners;</p> <p>(b) procedures and mechanisms for the regular distribution of information to stakeholders on the progress of the SSI and matters associated with environmental management;</p> <p>(c) procedures and mechanisms through which stakeholders can discuss or provide feedback to the Proponent and/or Environmental Representative in relation to the environmental management and delivery of the SSI;</p> <p>(d) procedures and mechanisms through which the Proponent can respond to any enquires or feedback from stakeholders in relation to the environmental management and delivery of the SSI; and</p> <p>(e) procedures and mechanisms that would be implemented to resolve any issues/disputes that may arise between parties on the matters relating to the environmental management and delivery of the SSI. This may include the use of an appropriately qualified and experienced independent mediator.</p> <p>Key issues to be addressed in the Community Communication Strategy should include, but not necessarily be limited to:</p> <p>(a) traffic management (including construction access and construction vehicle management);</p> <p>(b) noise and vibration mitigation and management;</p> <p>(c) erosion, sedimentation and stormwater management;</p> <p>(d) surface and groundwater management;</p> <p>(e) air quality; and</p> <p>(f) construction scheduling and progress on construction activities.</p> <p>The Proponent shall maintain and implement the Strategy throughout construction of the SSI. The Strategy shall be submitted to the Planning Secretary for approval at least one month prior to the commencement of construction, or as otherwise agreed to by the Planning Secretary.</p> <p>Prior to construction of the Turning Angle Works, the Proponent must provide a copy of the revised plan including the Turning Angle Works to the Environmental Representative for approval. The ER may approve minor updates to the plan without further consultation with public authorities.</p>	Compliant	1/09/2022
D2	Complaints and Enquiries Procedure	<p>Prior to the commencement of construction, the Proponent shall ensure that the following are available for community complaints and enquiries for the duration of construction:</p> <p>(a) a 24 hour telephone number(s) on which complaints and enquiries about the construction and operation of the SSI may be registered;</p> <p>(b) a postal address to which written complaints and enquiries may be sent;</p> <p>(c) an email address to which electronic complaints and enquiries may be transmitted; and</p> <p>(d) a mediation system for complaints unable to be re solved.</p> <p>The telephone number, the postal address and the email address shall be published in newspaper(s) circulating in the local area both prior to the commencement of construction and prior to the commencement of operation. The above details shall also be provided on the website (links or dedicated pages) required by this approval.</p> <p>Nothing in this condition precludes the Proponent from incorporating the requirements of this condition into, or utilising, an existing complaints and enquiries procedure administered by the Proponent, provided it is demonstrated to meet the requirements of this condition.</p>	Compliant	Ongoing

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
D3	Complaints and Enquiries Procedure	<p>The Proponent must prepare and implement a Complaints Management System consistent with AS 4269 Complaints Handling prior to the commencement of construction activities and must maintain the System for the duration of construction and for up to 12 months following completion of construction of the SSI.</p> <p>Information on all complaints received, including the means by which they were addressed and whether resolution was reached and whether mediation was required or used, must be maintained by the Proponent and included in a complaints register. The information contained within the System must be made available to the Director General on request.</p> <p>Nothing in this condition precludes the Proponent from incorporating the requirements of this condition into, or utilising, an existing complaints management system administered by the Proponent, provided it is demonstrated to meet the requirements of this condition.</p>	Compliant	Existing
D4	Provision of Electronic Information	<p>A website providing information in relation to the SSI must be established before commencement of works and maintained for the duration of construction, and up-to-date information (excluding confidential commercial information) must be published before the relevant works commencing and maintained on the website or dedicated pages including:</p> <p>(a) information on the current implementation status of the SSI; (b) a copy of the documents listed in Condition B1 of this approval, and any documentation relating to any modifications made to the SSI or the terms of this approval; (c) a copy of this approval in its original form, a current consolidated copy of this approval (that is, including any approved modifications to its terms), and copies of any approval granted by the Minister to a modification of the terms of this approval; (d) a copy of each statutory approval, licence or permit required and obtained in relation to the SSI; (e) a current copy of each document required under the terms of this approval, which must be published before the commencement of any works to which they relate or before their implementation, as the case may be; and (f) a copy of the compliance reports required under Condition D5 of this approval.</p> <p>Documents related to the construction of the project shall be maintained for a minimum of 24 months following the completion of construction of the Turning Angle Works. Documents related to the operation of the project must be maintained for the life of the project.</p>	Compliant	28/02/2023
D5	Compliance Tracking	No later than 4 weeks before the commencement of construction, a Compliance Monitoring and Reporting Program prepared in accordance with the Compliance Reporting Requirements (Department 2018) must be endorsed by the ER and submitted to the Department.	Non-Compliant	09/11/2022
D5(a)	Compliance Tracking	Compliance reports of the SSI must be carried out in accordance with the Compliance Reporting Requirements (Department 2018). The Department must be notified of the commencement dates of construction and operation of the SSI in the pre-construction and pre-operational compliance reports.	Non-Compliant	09/11/2022
D5(b)	Compliance Tracking	The construction compliance report must provide details of any review of, and minor amendments made to, the CEMP (which must be approved by the ER), resulting from construction carried out during the reporting period.	Not triggered	09/06/2023
D5(c)	Compliance Tracking	The Proponent must make each compliance report publicly available and notify the Department in writing when this has been done.	Non-Compliant	09/11/2022
D5(d)	Compliance Tracking	The Compliance Monitoring and Reporting Program in the form required under Condition A30 of this approval must be implemented for the duration of construction and for a minimum of one (1) year following commencement of operation, or for a longer period as determined by the Planning Secretary based on the outcomes of independent audits, Environmental Representative Reports and regular compliance reviews submitted through Compliance Reports. If staged operation is proposed, or operation is commenced of part of the SSI, the Compliance Monitoring and Reporting Program must be implemented for the relevant period of each stage or part of the SSI.	Non-Compliant	21/10/2022
D6	Incident Report	The Department must be notified in writing to compliance@planning.nsw.gov.au immediately after the Proponent becomes aware of an incident. The notification must identify the SSI (including application number and the name of the SSI), and set out the location and nature of the incident.	Not triggered	Ongoing

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
D7	Incident Report	The Proponent shall meet the requirements of the Director-General to address the cause or impact of any incident, as it relates to this approval, reported in accordance with condition D6, within such period as the Director-General may require.	Not triggered	Ongoing
E1	Clearing	The Proponent shall ensure that clearing of native vegetation and infilling of SEPP 14 Wetland No. 833 is limited to the minimal extent required for the construction and operation of the SSI, and no greater than 12 hectares (including SEPP 14 wetlands).	Not triggered	Ongoing
E2	Clearing	The Proponent shall implement all mitigation measures as identified in the Construction Flora and Fauna Management Plan (condition E63 (b)), to minimise the potential for damage to native vegetation (particularly threatened species and endangered ecological communities and their habitat) not proposed to be cleared as part of the SSI, to ensure that there is no incursion into, or clearing of the vegetation.	Compliant	28/02/2023
E3	Clearing	The Proponent shall mark areas of endangered ecological communities and threatened species habitat not to be impacted by the SSI with flagging tape or similar prior to commencing construction to ensure that there is no incursion into or clearing of the areas.	Not triggered	28/02/2023
E4	Clearing	Any areas temporarily disturbed during construction (including access tracks and compound sites) shall be rehabilitated to a standard equal to or better than the existing condition, as soon as feasible and reasonable following the completion of construction activities in the affected location. Replanting of affected vegetation shall be undertaken using locally occurring native species.	Not triggered	28/02/2023
E5	Clearing	The Proponent shall ensure that any coarse woody debris removed from the site, including timber from felled trees (particularly hollow bearing timber), shall be relocated to the Northern Offset site as identified in Appendix G of the document referred to in condition B1 (c) of this approval, for the enhancement of the ecological values of that site.	Not triggered	28/02/2023
E6	Pre-clearing surveys	Prior to construction, pre-clearing surveys and inspections for threatened flora and fauna species and habitat features (including hollow bearing trees) shall be undertaken. The surveys and inspections, and any subsequent relocation of species, shall be undertaken under the guidance of a suitably qualified and experienced ecologist. The methodology for pre-clearance surveys shall be incorporated into the Construction Flora and Fauna Management Plan (condition E63(b)). The Proponent is to undertake pre-clearing surveys prior to commencement of construction of the Turning Angle Works.	Compliant	21/09/2021
E7	Pre-clearing surveys	Should pre-clearing surveys reveal the need to remove tree hollows to construct and/or operate the SSI, the Proponent shall consider the need for the preparation of a Nest Box Plan. If a Plan is required, it shall be included as part of the Biodiversity Offset Package required by condition C4 and detail the number and type of nest boxes to be installed, which shall be justified based on the number and type of hollows removed, the density of hollows in the area to be cleared and in adjacent areas, and the availability of adjacent food resources. The Plan shall also consider the relocation of any hollows removed from the site to provide for potential nesting habitat. The Plan shall also provide details of maintenance protocols for any nest boxes installed including responsibilities, timing and duration.	Not triggered	21/09/2021
E8	Litoria aurea (Green and Golden Bell Frog)	The Proponent shall prepare a management plan that identifies the strategies that would be implemented in the event that the Green and Golden Bell Frog is identified during construction. The plan shall be developed in consultation with the OEH and include details on the mitigation measures to be implemented to minimise the risk to this species, including direct and indirect impacts to its habitat. The plan is to be submitted to the Director-General at least one month prior to construction, unless otherwise agreed by the Director-General. Nothing in this condition precludes the inclusion of this plan in the Flora and Fauna Management Plan (condition E63 (b)).	Compliant	21/10/2022

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
E9	Litoria aurea (Green and Golden Bell Frog)	In the event that the Green and Golden Bell Frog is identified to occur during construction, all work in the vicinity of the sighting shall stop to the extent necessary to allow the procedures set out in the management plan (condition E8) to be implemented.	Not triggered	
E10	Flora and Fauna Mitigation	In the event that other threatened fauna or flora species are identified during construction, all work in the vicinity of the sighting shall stop and management measures to minimise the risk to the species implemented in accordance with the procedure required by condition E63 (b)(iv).	Not triggered	
E11	Flora and Fauna Mitigation	<p>The Proponent shall implement measures to minimise impacts to fauna species and their habitat as far as practicable (and where feasible and reasonable), during the construction of the SSI, including:</p> <p>(a) protocols for the removal and relocation of fauna during clearing, including a two- stage clearing strategy;</p> <p>(b) establishing "no go" zones, including at freshwater wetland and coastal saltmarsh sites outside of the construction zone;</p> <p>(c) provision of setbacks;</p> <p>(d) presence of a suitably qualified and experienced ecologist to oversee clearing activities and facilitate fauna rescues and relocation;</p> <p>(e) timing construction to be outside of the breeding season of threatened species with the potential to occur on the site;</p> <p>(f) maintaining and reinstating habitat features (such as large woody debris, bush rock, leaf litter/mulch and topsoil etc.);</p> <p>(g) developing measures for minimising the incidence of fauna being trapped in excavation cells (such as minimising the length of time that cells are left exposed) and measures to deal with trapped or injured fauna;</p> <p>(h) implementing drainage controls to prevent the extension of Gambusia holbrooki (Eastern Mosquitofish) into the Hexham Swamp Nature Reserve; and</p> <p>(i) progressive re-vegetation of areas temporarily disturbed by construction.</p> <p>The Proponent is to implement the specific flora and fauna mitigation measures prior to commencement of construction of the Turning Angle Works.</p>	Compliant	28/02/2023
E12	Flora and Fauna Mitigation	Where reasonable and feasible, all private access tracks and internal service roads are to be at least 50 metres from SEPP 14 wetlands and the Hexham Swamp Nature Reserve or as otherwise agreed by the Planning Secretary , or as specified at an alternative distance in the documents listed under conditions B1 (c) of this approval.	Not triggered	1/09/2022
E13	Aboriginal Heritage	During detailed design and construction of the SSI, impacts to Aboriginal objects shall, where feasible and reasonable, be avoided and minimised, under the guidance of an appropriately qualified archaeological heritage consultant. Where impacts are unavoidable, works shall be undertaken in accordance with the strategy outlined in the Construction Heritage Management Plan (condition E63(e)).	Compliant	22/03/2022
E14	Aboriginal Heritage	Prior to the commencement of pre-construction and/or construction activities, the Proponent shall provide registered Aboriginal stakeholders with the opportunity to collect the shell material located in fill material near the southern end of the proposed SSI and for the material to be lodged in a keeping place in accordance with condition E63 (e)(i)V.	Not triggered	27/02/2014
E15	Aboriginal Heritage	Prior to the commencement of pre-construction and/or construction activities that will impact on HS1 and HS2, the Proponent shall provide for an appropriately qualified archaeological heritage consultant and registered Aboriginal stakeholders to record and collect any surface artefacts which would be affected by the construction of the SSI. The artefacts shall be lodged in a keeping place as identified under condition E63 (e)(i)V.	Not triggered	27/02/2014
E16	Aboriginal Heritage	The Proponent shall erect a protection zone around the rise of land near to Woodlands Close to prevent incursion into the HS1 area during the pre-construction and construction phases of the SSI. The area to be protected shall be delineated in consultation with the registered Aboriginal stakeholders and an appropriately qualified archaeological heritage consultant.	Not triggered	27/02/2014

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
E17	Historic Heritage	The Proponent shall prepare an Interpretation Plan to ensure that the proposed plaque and salvaged building materials are used appropriately and placed in appropriate locations to ensure that the sites users are able to understand and appreciate the sites history and heritage. The Interpretation Plan will be prepared by an appropriately qualified interpretation specialist and will be submitted to the Heritage Council for review prior to the installation of these interpretive features.	Not triggered	6/03/2014
E18	Construction Hours	Construction activities (including the delivery of materials) associated with the SSI shall be undertaken during the following standard construction hours: (a) 7:00 am to 6:00 pm Mondays to Fridays, inclusive; and (b) 8:00 am to 1 :00 pm Saturdays; (c) at no time on Sundays or public holidays.	Compliant	28/02/2023
E19	Construction Hours	Construction activities (including the delivery of materials) outside of the prescribed construction hours identified in condition E 18 may be undertaken in the following circumstances: (a) construction works where the cumulative air-borne noise generated is: (i) no more than 5 dB(A) above the rating background level at any residence in accordance with the Interim Construction Noise Guideline (DECC, 2009); and (ii) no more than the noise management levels specified in Table 3 of the Interim Construction Noise Guideline (DECC, 2009) at other sensitive receivers; (b) where a negotiated agreement has been reached with affected receivers as the prescribed noise and vibration levels cannot be achieved; (c) for the delivery of materials required outside these hours by the NSW Police Force, RMS or other authorities for safety reasons; (d) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; or (e) works approved through an EPL (including rail possessions) and in accordance with an out-of-hours works procedure.	Not triggered	28/02/2023
E20	Construction Hours	Except as expressly permitted by an EPL, high noise impact activities and works resulting in impulsive or tonal noise emissions (such as rock braking, rock hammering and pile driving) shall only be undertaken: (a) between the hours of 8:00 am to 5:00 pm Monday to Friday; (b) between the hours of 8:00 am to 1 :00 pm Saturday; and (c) in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block. For the purposes of this condition 'continuous' includes any period during which there is less than a one hour respite between ceasing and recommencing any of the work which is the subject of this condition.	Not triggered	28/02/2023
E21	Construction Noise and Vibration	The Proponent shall implement all reasonable and feasible noise mitigation measures with the aim of achieving the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009). Any activities that could exceed the construction noise management levels shall be identified and managed in accordance with the Construction Noise and Vibration Management Plan required under condition E63 (c) of this approval.	Compliant	28/02/2023
E22	Construction Noise and Vibration	The SSI shall be constructed with the aim of achieving the following construction vibration goals and ground-borne noise levels: (a) for structural damage vibration, the vibration limits set out in the German Standard DIN 4150 Part 3-1999 Structural Vibration in Buildings - Effects on Structures; (b) for human exposure, the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: A Technical Guideline (DEC, 2006) ; and (c) the ground-borne noise levels set out in the Interim Construction Noise Guideline (DECC, 2009).	Compliant	Ongoing
E23	Construction Noise and Vibration	Wherever feasible and reasonable, piling activities shall be undertaken using quieter alternative methods than impact or percussion piling, such as bored piles or vibrated piles.	Not triggered	

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
E24	Construction Noise and Vibration	The Proponent shall identify and consult with potentially-affected community, religious, educational institutions and vibration-sensitive businesses and critical working areas, including the Church on Old Maitland Road, Hexham, and where feasible and reasonable ensure that noise generating construction works in the vicinity of the receivers are not timetabled during sensitive periods, unless appropriate other arrangements are made.	Not triggered	31/10/2015
E25	Construction Noise and Vibration	During construction, Proponents of other construction works in the vicinity of the SSI shall be consulted, and feasible and reasonable steps taken to coordinate works to minimise impacts on, and maximise respite for, affected sensitive receivers.	Not triggered	5/08/2014
E26	Construction Noise and Vibration	<p>The Proponent shall prepare and implement a management plan for each rail possession where construction works are being undertaken. The Plan shall include, but not be limited to:</p> <p>(a) a description of the works to be undertaken during the rail possession;</p> <p>(b) justification for the works to be undertaken during the possession, including reasons as to why the works are unable to be undertaken during standard construction hours;</p> <p>(c) timing and duration of the possession;</p> <p>(d) an out-of-hours work (OOHW) protocol for the assessment, management and approval of works outside of standard construction hours as defined in condition E18 including a risk assessment process under which an Environmental Representative may approve out-of-hour construction activities deemed to be of low environmental risk and refer high risk works for the Director-General's approval. The OOHW protocol shall detail standard assessment, mitigation and notification requirements for high and low risk out-of-hour works, and detail a standard protocol for referring applications to the Director-General;</p> <p>(e) a construction noise impact statement detailing the predicted noise levels, and specific management measures in relation to properties where noise levels are predicted to exceed the noise criteria in the Interim Construction Noise Guidelines (DECC, 2009); and</p> <p>(f) a consultation and notification process for affected sensitive receivers.</p> <p>The Plan shall be submitted to the Director-General at least one month prior to the rail possession, unless otherwise agreed by the Director-General.</p> <p>Works undertaken during a rail possession shall be limited to those necessary to facilitate critical work on or in the immediate vicinity of the rail line which cannot otherwise be undertaken due to safety issues and/or track reliability.</p>	Not triggered	31/10/2015
E27	Sediment and Erosion	Fluvial geomorphology, soil and water management measures consistent with the recommended mitigation measures in Appendix E of the document referred to in condition B1 (c) and the measures in Managing Urban Stormwater - Soils and Construction Volumes 1 and 2, 4th Edition (Landcom, 2006) shall be employed prior to and during the construction of the SSI (including prior to clearing) to minimise soil erosion and the discharge of sediment and other pollutants to land and/or waters.	Compliant	17/02/2023
E28	Sediment and Erosion	Facilities shall be provided (including at all exit points leading onto public roads) to minimise tracking mud, dirt or other material onto a public road or footpath. In the event of any spillage, the Proponent shall remove the spilled material as soon as practicable within the working day of the spillage.	Compliant	13/03/2020
E29	Sediment and Erosion	Where reasonable and feasible, the Proponent shall undertake the upgrade of waterway crossing during periods of dry weather.	Not triggered	6/07/2020

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
E30	Contamination	Prior to the commencement of construction the Proponent shall undertake further investigations as recommended in the Remediation Action Plan included in Appendix H of the document referred to in condition B1 (c), to confirm the presence of contaminants on site, based on detailed design requirements. Upon confirmation of the contaminated areas on site, the Proponent shall update the Remediation Action Plan as required to take into account any new or updated procedures relevant to any new areas of contamination identified and remediate the identified sites in accordance with the updated Remediation Action Plan, prior the commencement of construction in the impacted areas.	Not triggered	11/09/2014
E31	Contamination	Where unexpected contaminated materials are identified during construction works, these materials would be identified, managed, treated and disposed of in accordance with the procedures outlined in the updated Site Management Plan . Where required, the Proponent shall engage a suitably qualified contaminated land consultant to prepare an addendum to the Validation Report referred to in condition E33 to cover the additional areas of contamination identified and additional remediation measures undertaken. The Proponent shall also engage an accredited NSW Site Auditor to prepare an updated Site Audit Report to assess the addendum Validation Report and submit a copy of both reports to the Planning Secretary and City of Newcastle.	Not triggered	Ongoing
E32	Contamination	Prior to the reuse of ballast, chitter or tailings within the existing railway corridor, the Proponent shall undertake sampling and testing of the materials to establish whether: (a) the materials are of a quality suitable for the intended reuse; and (b) the removal and reuse of the materials would not result in contaminated runoff. Materials that are not suitable for reuse are to be classified in accordance with the Waste Classification Guidelines (DECCW, 2009) or any superseding document.	Not triggered	Ongoing
E33	Contamination	The Proponent shall engage a suitably qualified contaminated land consultant to prepare a Validation Report upon completion of the remediation of the areas identified in the Remediation Action Plan. The Validation Report shall verify that the site has been remediated in accordance with the Remediation Action Plan (if and as amended) and to a standard consistent with the intended land use. The Proponent shall engage an accredited NSW Site Auditor to prepare a Site Audit Report to determine the appropriateness of the Validation Report. The Validation Report and Site Audit Report shall be submitted to the Planning Secretary within six months of completion of remediation works . A copy of the reports shall also be submitted to the City of Newcastle for its information.	Not triggered	Ongoing
E34	Riparian and Aquatic Ecology	Impacts to riparian areas shall be minimised to the greatest extent practicable. Riparian vegetation in and around watercourses affected by the construction of the SSI shall be restored and rehabilitated in consultation with NoW and DPI (Aquaculture and Fisheries). Restoration and rehabilitation measures, including timeframes and reporting on completion of works, shall be included in the Construction Flora and Fauna Management Plan as required by (condition E63 (b)).	Not triggered	Ongoing
E35	Riparian and Aquatic Ecology	Construction activities undertaken in and around watercourses (including creek crossings) shall be consistent with the relevant NoW's Guidelines for Controlled Activities, including, but not limited to, 'In-stream Works', 'Outlet Structures', 'Riparian Corridors', 'Vegetation Management Plans', and 'Watercourse Crossings', or any guidelines which supersede these documents.	Not triggered	Ongoing
E36	Riparian and Aquatic Ecology	The Proponent shall schedule earthworks and any works on hydraulic controls to ensure that connection between the Hunter River and Hexham Swamp floodplain is retained throughout construction.	Not triggered	31/10/2015
E37	Flooding	The Proponent shall ensure that all fuels, dangerous goods and hazardous substances used in the construction of the SSI are stored in bunded locations above the 1 % AEP flood level, unless otherwise agreed by the Director-General.	Compliant	Ongoing

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
E38	Flooding	The Proponent shall ensure that all areas used for the storage and treatment of acid sulfate soils during construction of the SSI are located or elevated above the 1 % AEP flood level, unless otherwise agreed by the Director-General.	Not triggered	28/02/2023
E39	Groundwater	Changes to hydrogeology, including groundwater depths, interception and connection with surface water, shall be minimised to the greatest extent practicable.	Compliant	Ongoing
E40	Groundwater	Dewatered groundwater shall not be discharged from the construction site or applied on site unless in accordance with an EPL.	Compliant	28/02/2023
E41	Road Dilapidation	<p>The Proponent shall engage an independent and qualified person(s) to prepare Road Dilapidation Reports for the Tarro Interchange prior to their use by construction heavy vehicles. The report shall assess the current condition of the road and describe mechanisms to restore any damage that may result due to traffic and transport related to the construction of the SSI. The Report shall be submitted to the relevant road authority(ies) for review prior to use of the roads for construction.</p> <p>Following completion of construction, a subsequent report shall be prepared to assess any damage caused by the construction of the SSI.</p> <p>The Proponent shall ensure that any measures to restore or reinstate roads affected by the construction of the SSI are undertaken in a timely manner, in accordance with the requirements, and to the satisfaction, of the relevant road authority(ies), and at the full expense of the Proponent.</p> <p>Any pavement failures arising from construction traffic that result in safety concerns for other road users, shall be repaired in accordance with the relevant road authority's specifications no later than 48 hours following notification by the relevant road authority.</p> <p>The Proponent must ensure that Road Dilapidation Reports are prepared prior to commencement of construction of the Turning Angle Works.</p>	Compliant	Ongoing
E42	Construction Access	The Proponent shall construct, in the event it is responsible, a new T-intersection on Anderson Drive (Tarro Interchange) on the southern side of the New England Highway, in accordance with the requirements of the RMS, including entering into a Works Authorisation Deed with the RMS. The T-intersection at the Tarro Interchange shall be linked to Woodlands Close via a construction access road as detailed in the document referred to in condition B1 (c).	Not triggered	1/08/2014
E43	Construction Access	The Proponent shall design, in the event it is responsible, the T-intersection and construction access road and all associated traffic control signals and other structures in accordance with current AustRoads Standards and to the satisfaction of the relevant road authority(ies), and ensure that it is capable of accommodating the proposed construction traffic generated by the SSI and proposed ARTC Hexham Relief Roads project.	Not triggered	1/08/2014
E44	Construction Access	The Proponent shall, in the event it is responsible, seal the construction access road prior to commencement of use by construction traffic to provide all weather access.	Not triggered	1/08/2014
E45	Construction Access	Construction traffic shall not be permitted to access the SSI site via the New England Highway/Woodlands Close intersection at any time or unless otherwise approved by RMS.	Compliant	28/02/2023
E46	Construction Access	Construction heavy vehicle traffic shall not utilise Anderson Drive between Woodberry Drive and its intersection with the New England Highway near Glenwood Drive, Tarro, unless otherwise approved under the Construction Traffic and Access Management Plan required by condition E63 (a).	Compliant	28/02/2023

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
E47	Construction Access	Condition deleted.	Not triggered	
E48	Construction Access	During construction of the SSI, the Proponent shall take all feasible and reasonable measures to minimise impacts on intersection performance and maintain the existing levels of service. Where modifications to intersections are required to maintain intersection performance, the Proponent shall obtain the necessary approvals from the relevant road authority.	Compliant	
E49	Construction Access	All construction works associated with the T-intersection on Anderson Drive (Tarro Interchange), Woodlands Close and the construction access road must be at no cost to the relevant road authorities, and to the satisfaction of the relevant road authorities.	Not triggered	31/10/2015
E50	Construction Access	The Proponent shall ensure as far as practicable that construction heavy and oversized vehicles associated with the construction of the SSI adhere to nominated haulage routes identified in the Construction Traffic and Access Management Plan (condition E63 (a)).	Compliant	Ongoing
E51	Construction Access	The Proponent shall ensure as far as practicable that all construction vehicles using public roads are maintained to prevent any loss of load, whether dust, liquid or soils.	Compliant	Ongoing
E52	Construction Access	Safe pedestrian and cyclist access through or around worksites shall be maintained during construction. In circumstances where pedestrian and cyclist access is restricted due to construction related activities, a feasible and reasonable alternate route shall be provided and signposted.	Compliant	Ongoing
E53	Private Property Access and Infrastructure	Access to private property shall be maintained during construction, unless otherwise agreed with the property owner in advance. Where access to a property is to be affected by construction of the SSI, the Proponent shall provide an alternative access of a standard that is at least equivalent to that currently existing and meets relevant road safety standards, prior to commencement of construction, unless otherwise agreed with the property owner. Details for provision of altered access shall be determined in consultation with the landholder.	Compliant	Ongoing
E54	Private Property Access and Infrastructure	Subject to agreement with the relevant landowner, a landowner's access that is physically affected by the SSI shall be reinstated to at least an equivalent standard upon completion of construction of the SSI, in consultation with the property owner.	Compliant	Ongoing
E55	Air Quality	The Proponent shall construct the SSI in a manner that minimises, as far as practicable, dust emissions from the site, including wind-blown and traffic-generated dust, dust from stockpiles, and dust from the tracking of materials from the construction site onto public roads.	Compliant	Ongoing

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
E56	Air Quality	Should such visible dust emissions occur at any time, the Proponent shall identify and implement all feasible and reasonable dust mitigation measures (including temporary cessation of relevant works) such that emissions of visible dust cease.	Compliant	Ongoing
E57	Air Quality	The Proponent shall ensure that plant and equipment used in connection with the construction of the SSI is maintained and operated in a proper and efficient condition to minimise air quality impacts.	Compliant	6/07/2020
E58	Visual Amenity	The SSI shall be constructed in a manner that minimises, as far as practicable, visual impacts resulting from construction sites, including retaining existing vegetation around the perimeter of construction sites, where feasible and reasonable, providing temporary landscaping or screening, and minimising light spillage.	Compliant	28/02/2023
E59	Ancillary Facilities	<p>Unless otherwise approved by the Director-General, Ancillary Facilities shall:</p> <ul style="list-style-type: none"> (a) be located more than 50 metres from a waterway, SEPP 14 wetland or the Hexham Swamp Nature Reserve; (b) be located within or in close proximity to the construction footprint for the SSI; (c) be sited on relatively level land; (d) be separated from nearest residences by at least 200 metres (or at least 300 metres for a temporary batching plant); (e) not require native vegetation clearing beyond that already required by the SSI; (f) not impact on known heritage items (including areas of archaeological sensitivity) beyond those already impacted by the SSI; (g) not unreasonably affect the land use of adjacent properties; (h) be above the 10% AEP flood level unless a contingency plan to manage flooding is prepared and implemented; and (i) provide sufficient area for the storage of raw materials to minimise, to the greatest extent practical, the number of deliveries required outside standard construction hours. <p>The location of the ancillary facilities shall be identified in the Construction Environmental Management Plan (condition E62) and include consideration of the above criteria. Where the above criteria cannot be met for any proposed ancillary facility, the Proponent shall demonstrate to the satisfaction of the Director-General that there will be no significant adverse impact from that facility's construction. Such assessment(s) can be submitted separately or as part of the Construction Environmental Management Plan.</p> <p>The Director-General's approval is not required for the construction site compounds already identified in the document referred to in condition B1 (c) of this approval</p>	Compliant	20/02/2014 13/06/2014
E60	Ancillary Facilities	All Ancillary Facilities shall be rehabilitated to at least their pre-construction condition, unless otherwise agreed by the landowner where relevant.	Not triggered	Ongoing

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
E61	Environmental Representative	<p>Prior to the commencement of construction of the SSI, or as otherwise agreed by the Planning Secretary, the Proponent shall nominate for the approval of the Planning Secretary a suitably qualified and experienced Environment Representative(s) that is independent of the design (including preparation of documentation referred to condition B1), and construction personnel. The Proponent shall employ the Environmental Representative(s) for the duration of construction, or as otherwise agreed by the Planning Secretary. The Environment Representative(s) shall:</p> <ul style="list-style-type: none"> (a) be the principal point of advice in relation to the environmental performance of the SSI; (b) monitor the implementation and outcome of all environmental management plans and monitoring programs required under this approval and advise the Proponent upon the achievement of these plans and programs; (c) have responsibility for considering and advising the Proponent on matters specified in the conditions of this approval, and all other licences and approvals related to the environmental performance and impacts of the SSI; (d) ensure that environmental auditing is undertaken in accordance with the requirements of condition D5(a) of this approval and the Proponent's Environmental Management System(s); (e) be given the authority to approve/reject minor amendments to the Construction Environment Management Plan. What constitutes a "minor" amendment shall be clearly explained in the Construction Environment Management Plan required under condition E62; (f) be given the authority and independence to require reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur; and (g) be consulted in responding to the community concerning the environmental performance of the SSI where the resolution of points of conflict between the Proponent and the community is required. <p>The Environmental Representative must be retained for the duration of the construction of the Turning Angle Works. If the Environmental Representative previously engaged by this condition has been discharged from the SSI, a new Environmental Representative must be nominated to and approved by the Planning Secretary.</p>	Compliant	14/10/2022

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
E62	CEMP	<p>Prior to the commencement of construction, the Proponent shall prepare and (following approval) implement a Construction Environmental Management Plan for the SSI. The Plan shall be prepared in accordance with the Guideline for the Preparation of Environmental Management Plans (DIPNR, 2004) and outline the environmental management practices and procedures to be followed during construction, and shall include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> (a) a description of all relevant activities to be undertaken during construction of the SSI, including scheduling; (b) statutory and other obligations that the Proponent is required to fulfil during construction including all approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies. Evidence of consultation with relevant public authorities shall be included; (c) a description of the roles and responsibilities for all relevant employees involved in the construction of the SSI, including relevant training and induction provisions for ensuring that all employees, including contractors and sub-contractors are aware of their environmental and compliance obligations under these conditions of approval; (d) identification of ancillary facility site locations, including an assessment against the location criteria outlined in condition E59; (e) an environmental risk analysis to identify the key environmental performance issues associated with the construction phase and details of how environmental performance would be monitored and managed to meet acceptable outcomes including the actions to be undertaken to address identified potential adverse environmental impacts. In particular, the following environmental performance issues shall be addressed in the Plan: <ul style="list-style-type: none"> (i) measures to monitor and manage dust emissions including dust generated by haulage trucks, traffic on unsealed internal access roads and stockpile management, (ii) measures to monitor and manage waste (solid and liquid) generated during construction including, but not necessarily limited to, identification of potential waste streams, general procedures for waste classification, waste management and mitigation measures, use of secondary waste material in construction wherever feasible and reasonable, and procedures for dealing with green waste, (iii) measures to monitor and manage spoil and fill including earthworks volumes, details of how spoil and fill would be handled, stockpiled, classified, used and disposed of, and a stockpile management protocol detailing location criteria that would guide the placement of stockpiles and minimum management measures (including rehabilitation) that would be implemented to avoid and/or minimise amenity impacts to surrounding residents and environmental risks (including to surrounding watercourses and wetlands), and (iv) measures to monitor and manage hazard and risks including emergency management; (f) measures for rehabilitating construction disturbance areas that are not required for ongoing operations including construction compounds; (g) details of community complaints handling procedures and community involvement strategies during construction, consistent with the requirements of conditions D1 and D2 of this approval, (h) details of compliance and incident management and reporting consistent with the requirements of conditions D5, D6 and D7; (i) procedures for the periodic review and update of the Construction Environmental Management Plan as necessary (including where minor changes can be approved by the Environmental Representative); and (j) the additional Plans listed under condition E63. <p>The Plan shall be submitted for the approval of the Planning Secretary at least one month prior to the commencement of construction, or within such period otherwise agreed by the Planning Secretary. Construction works shall not commence until written approval has been received from the Planning Secretary.</p> <p>Prior to construction of the Turning Angle Works, the Proponent must provide a copy of the revised plan including the Turning Angle Works to the Environmental Representative for approval.</p> <p>Note: The approval of a Construction Environmental Management Plan does not relieve the Proponent of any requirement associated with this infrastructure approval. If there is an inconsistency with an approved Construction Environmental Management Plan and the conditions of this infrastructure approval, the requirements of this infrastructure approval prevail.</p>	Compliant	21/10/2022

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
E63	CEMP	<p>As part of the Construction Environment Management Plan for the SSI required under condition E62 of this approval, the Proponent shall prepare and implement the plans listed at (a) to (f) below. Where a plan is required to be prepared in consultation with an authority or stakeholders, the plan shall provide details on the consultation undertaken including any comments received and where these have been addressed in the plan.</p> <p>(a) A Construction Traffic and Access Management Plan to manage construction traffic and access impacts of the SSI and minimise disruptions to local traffic movements. The Plan shall be developed in consultation with the relevant road authority(ies) and include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> (i) identification of construction traffic and haulage routes and quantification of projected construction traffic volumes (including light, heavy and over- dimensional/ over mass sized vehicle movements, and spoil haulage), including any necessary route or timing restrictions on oversized loads. Construction traffic volumes and haulage routes should be detailed for the proposed T-intersection at the Tarro Interchange and New England Highway/Woodlands Close; (ii) details of the construction program for the T-intersection at the Tarro Interchange and construction access road connecting the intersection to Woodlands Close; (iii) a description of the site access arrangements for light, heavy and over-sized vehicles prior to and upon completion of the T-intersection at the Tarro Interchange and construction access road connecting the intersection to Woodlands Close; (iv) a Vehicle Movement Plan and Traffic Control Plans; (v) a protocol for minimising the cumulative construction traffic impacts of the SSI and proposed ARTC Hexham Relief Roads project, prepared in consultation with ARTC; (vi) methods for advising motorists of construction activities at the T-intersection on Anderson Drive (Tarro Interchange); (vii) details of the traffic management measures and key warning signage to be installed at the T-intersection on Anderson Drive (Tarro Interchange); (viii) construction staff parking requirements and the location(s) of proposed parking facilities; (ix) details of all temporary road closures and detours and measures to minimise impacts on local traffic; (x) a description of any proposed changes to pedestrian access at Woodlands Close, including measures to minimise impacts on pedestrian access; (xi) a driver code of conduct; and (xii) mechanisms for the monitoring, review and amendment of this plan. 	Compliant	21/10/2022
E63 (continued)	CEMP	<p>(b) A Construction Flora and Fauna Management Plan to detail how construction impacts on ecology will be minimised, managed and monitored. The Plan shall be developed in consultation with the EESG and the Water Group and shall include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> (i) details of pre-construction surveys required to verify the construction boundaries/footprint of the SSI based on detailed design and to confirm the vegetation to be cleared as part of the SSI (including threatened flora and fauna species, endangered ecological communities, riparian vegetation and tree hollows); (ii) details on the location (including plans) of all native vegetation communities, threatened flora and fauna species and their habitat, and endangered ecological communities to be impacted by the SSI; (iii) details of mitigation measures to be implemented during construction to minimise impacts on native fauna and vegetation (particularly threatened species and endangered ecological communities and their habitats), including measures to be implemented in those areas that will not be cleared. Measures shall include, but not necessarily be limited to, the mitigation measures set out in this infrastructure approval, delineation of sensitive areas, a protocol for the removal and relocation of fauna during clearing, fauna rescue procedure, appropriate topsoil management, erosion and sediment control, and construction worker education; (iv) a procedure for dealing with unexpected finds of threatened species and endangered ecological communities and their habitat identified during construction, including stopping works and notification to the EESG and the Department, determination of appropriate mitigation measures in consultation with the EESG (including relevant re-location measures), and updating of biodiversity offset requirements consistent with condition C4; (v) procedures for clearing blockages in waterways resulting from construction of the SSI; (vi) weed management measures focusing on early identification of invasive weeds and effective management controls; (vii) proposed revegetation and rehabilitation measures, including identification of flora species and sources, completion criteria and measures for the management and maintenance of rehabilitated/ revegetated areas; (viii) a description of how the effectiveness of management measures would be monitored and linked to the Ecological Monitoring Program required under condition C3; and (ix) mechanisms for the monitoring, review and amendment of this plan. 	Compliant	20/12/2019

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
E63 (continued)	CEMP	<p>(c) A Construction Noise and Vibration Management Plan to detail how construction noise and vibration impacts will be minimised and managed. The Plan shall include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> (i) identification of the nearest sensitive receivers and relevant construction noise and vibration goals applicable to the SSI; (ii) identification of key noise and vibration generating construction activities (based on representative construction scenarios) that have the potential to impact on surrounding sensitive receivers; (iii) details on predicted worst-case construction noise impacts, including traffic noise and cumulative noise impacts associated with on-site construction activities and construction of the adjacent proposed HRR project; (iv) identification of all feasible and reasonable measures for minimising construction noise and achieving the relevant noise management goals at sensitive receivers (including construction traffic noise impacts) required by condition E21; (v) procedures and mitigation measures to ensure relevant vibration criteria are achieved, including applicable buffer distances for vibration intensive works, use of low-vibration generating equipment/vibration dampeners or alternative construction methodology, and pre- and post- construction dilapidation surveys of sensitive structures where vibration is likely to result in damage to structures; (vi) a protocol for minimising the cumulative construction noise and vibration impacts of the SSI and proposed ARTC Hexham Relief Roads project, prepared in consultation with ARTC; (vii) procedures for notifying sensitive receivers of construction activities that are likely to affect their noise and vibration amenity, as well as procedures for dealing with and responding to noise complaints; (viii) a safety risk assessment to determine the availability of safe alternatives to 'beeper' type reversing or movement alarms on vehicles, plant and equipment used during the construction of the SSI; (ix) a program and procedures for construction noise and vibration monitoring indicating monitoring frequency and location, monitoring methods, responsibilities for monitoring and assessment, methods for recording and reporting monitoring results, and procedures to be followed where exceedances of relevant noise and vibration goals are detected; and (x) mechanisms for the monitoring, review and amendment of this Plan. 	Compliant	21/10/2022
E63 (continued)	CEMP	<p>(d) A Construction Soil and Water Management Plan to manage surface water and groundwater impacts during the construction of the SSI. The Plan shall be developed in consultation with the City of Newcastle, the Water Group and Hunter-Central Rivers CMA and include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> (i) surface water and groundwater impact assessment criteria consistent with the principles of the Australian and New Zealand Environment Conservation Council (ANZECC) guidelines; (ii) identification of all potential sources of water pollution and contaminants and details on the mitigation measures to be implemented to prevent the discharge of pollutants and contaminants from the SSI site, including saline and acid sulphate soils, and groundwater contaminants; (iii) details of the control measures to be employed to minimise surface and groundwater impacts, including drawdown of groundwater levels and connections with surface waters; (iv) management measures to be used to minimise surface and groundwater impacts, including identification of water treatment measures and discharge points, details of how spoil and fill material required by the SSI will be sourced, handled, stockpiled, reused and managed; erosion and sediment control measures; salinity control measures and the consideration of flood events; (v) management measures for contaminated material and a contingency plan to be implemented in the case of unanticipated discovery of contaminated material during construction; (vi) details on the methods for managing surface water runoff (including inlets and outlets and their capacity) and any accumulation of groundwater (including from excavation and dewatering) and surface water, including procedures for handling, treatment and disposal and/or reuse; (vii) details of how construction activities would be managed and mitigated to minimise erosion and sedimentation, consistent with condition E27; (viii) a program for reporting on the effectiveness of the water management measures and sediment and erosion controls against performance criteria; including procedures for rectifying any non-compliances; (ix) water quality monitoring consistent with the requirements of condition C19; (x) contingency plans to be implemented in the event of major fuel spills or other chemicals; (xi) an Acid Sulfate Soils Management Plan consistent with the Acid Sulfate Soils Manual, including a contingency plan to deal with the unexpected discovery of actual or potential acid sulfate soils, including procedures for the investigation, handling, treatment and management of such soils and water seepage; (xii) a contingency plan in the event that groundwater levels are observed to fall below the top of areas defined as containing potential acid sulfate soils; (xiii) a water balance plan detailing the source and security of construction water supply, water use on site, and water and wastewater management on site; (xiv) measures to minimise stream hydrology impacts, including measures to stabilise bank structures where required and details of proposed buffer zones adjacent to waterways; (xv) a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be undertaken, the locations where monitoring would take place, how the results of the monitoring would be recorded and reported, and, if any exceedance of the criteria is detected how any non-compliance can be rectified; and (xvi) mechanisms for the monitoring, review and amendment of this Plan 	Compliant	21/10/2022

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
E63 (continued)	CEMP	<p>(e) a Construction Heritage Management Plan to detail how construction impacts on Aboriginal and Historic heritage will be minimised and managed. The Plan shall be developed in consultation with the EESG and registered Aboriginal stakeholders (for Aboriginal heritage), and include, but not necessarily be limited to:</p> <p>(i) In relation to Aboriginal Heritage - I. identification of Aboriginal objects directly and indirectly affected by the SSI, II. details of management measures to be carried out in relation to Aboriginal heritage, including a detailed methodology and strategies for protection, monitoring, salvage, and conservation of objects associated with the SSI, III. procedures and timing for implementing the requirements of conditions E13 to E16 inclusive, IV. procedures for dealing with previously unidentified Aboriginal objects (excluding human remains) including cessation of works in the vicinity, assessment of the significance of the item(s), determination of appropriate mitigation measures by a suitably qualified archaeologist in consultation with the Department, EESG and registered Aboriginal stakeholders, procedure for determining when works can re-commence, and assessment of the consistency of any new Aboriginal heritage impacts against the approved impacts of the SSI, and registering of any new site(s) in the AHIMS database, V. details of an appropriate keeping place agreement with local Aboriginal community representatives for any Aboriginal objects salvaged during construction, VI. procedures for ongoing Aboriginal consultation and involvement for the duration of the SSI, and VII. procedures for managing the discovery of confirmed or potential human remains, including the temporary cessation of works in the vicinity and notification to the NSW Police Force, EESG, the Department and registered Aboriginal stakeholders and not recommencing any works in the area unless authorised by the EESG and/ or the NSW Police Force;</p> <p>(ii) In relation to Historic Heritage - I. developed in consultation with the Heritage Division, II. identification of heritage items directly and indirectly affected by the SSI, III. details of management measures to be implemented to prevent and minimise impacts on heritage items including measures to protect unaffected sites during construction works in the vicinity, IV. details of the Interpretation Plan as required by condition E17; V. details of monitoring and reporting requirements for impacts on heritage items; VI. procedures for dealing with previously unidentified heritage items, (including cessation of works in the vicinity), assessment of the significance of the item(s) and determination of appropriate mitigation measures including when works can re-commence by a suitably qualified and experienced archaeologist in consultation with the Heritage Division and the Department, and assessment of the consistency of any new heritage impacts against the approved impacts of the SSI; (iii) heritage training and induction processes for construction personnel (including procedures for keeping records of inductions) and obligations under the conditions of this approval including site identification, protection and conservation of Aboriginal and historic heritage; and (iv) mechanisms for the monitoring, review and amendment of this Plan.</p>	Compliant	21/10/2022
E63 (continued)	CEMP	<p>(f) a Construction Contamination Management Plan to detail how contaminated materials, water and soil will be managed to protect human health and the environment. The Plan shall include, but not necessarily be limited to:</p> <p>(i) location of areas identified as contaminated; (ii) procedures for the sampling and assessment of excavated material at depth consistent with the requirements of condition E30; (iii) procedures for the sampling and testing of ballast, chitter and tailings consistent with the requirement of condition E32; (iv) procedures for the classification, remediation, handling and monitoring of contaminated materials, water and soils identified during construction (including asbestos), consistent with the Remediation Action Plan included as Appendix H in the document referred to in condition B1(c). (v) a contingency plan to be implemented in the case of unanticipated discovery of contaminants; (vi) a procedure for updating the Remediation Action Plan consequent to amendments in the remediation procedures or the discovery of contaminants during construction; (vii) program for validating soil quality upon completion of remediation; and (viii) mechanisms for the monitoring, review and amendment of this Plan.</p> <p>Prior to construction of the Turning Angle Works, the Proponent must submit revised plans including the Turning Angle Works to the Environmental Representative for approval. The ER may approve minor updates to the plan without further consultation with public authorities. The plans required by Condition E63(e) only apply to the Turning Angle Works insofar as they provide for unexpected finds procedures and staff training and induction.</p> <p>The reference to the ecological monitoring plan referred to in condition E63(b)(viii) does not apply to the Turning Angle Works.</p>	Compliant	21/10/2022

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
F1	Operation Environmental Management	Prior to commencement of operations, the Proponent shall incorporate the SSI into an existing environmental management system administered by the Proponent and prepared in accordance with the AS/NZS /SO 14000 Environmental Management System series or equivalent.	Compliant	21/10/2022
F2	Operation Environmental Management	<p>Prior to the commencement of operation, or as otherwise agreed by the Planning Secretary, the Proponent shall prepare and implement an Operation Environmental Management Plan for the SSI. The Plan shall detail the environmental management framework, practices and procedures to be followed during operation of the SSI. The Plan shall be consistent with the document Guideline for the Preparation of Environmental Management Plans (DIPNR, 2004). The Plan shall be prepared in consultation with the relevant government authorities and include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> (a) a description of all relevant activities to be undertaken during operation of the SSI; (b) statutory and other obligations that the Proponent is required to fulfil during operation including all approvals, consultations and agreements required from authorities, and key legislation and policies; (c) details of how the SSI's environmental performance will be monitored and what actions will be taken to address identified adverse environmental impacts; (d) where required, measures to monitor and maintain biodiversity offset measures implemented in accordance with condition C4 of this approval; (e) measures to monitor and maintain the effectiveness of flora and fauna management measures, including revegetated areas, landscaped areas and the control of the spread of weeds; (f) measures to monitor and manage noise impacts; (g) measures to monitor and control soil erosion and the discharge of sediment and other pollutants to surrounding lands and waterways; (h) procedures for periodic monitoring of groundwater depth and flow and groundwater quality in the vicinity of the SSI and groundwater seepage, including the location and frequency of monitoring; (i) a contingency plan to address changes in groundwater depths and flows and/or groundwater quality and groundwater seepage into the drainage swales; (j) measures to monitor and manage hazards and risks; (k) management and maintenance measures for the floating wetlands, and for the entire stormwater system, including pits and pipes, cess drains, sediment basins, gross pollutant traps and detention basins; (l) management measures for maintaining the Purgatory Creek culvert; (m) emergency management procedures; (n) measures for maintaining the stormwater management system including the drainage swales; and (o) measures to minimise dust generation from internal service roads. 	Compliant	26/05/2020
F2 (continued)	Operation Environmental Management	<p>The Plan shall be submitted for the Planning Secretary's approval no later than one month prior to the commencement of operation, or as otherwise agreed by the Planning Secretary. Operation of the SSI shall not commence until written approval has been received from the Planning Secretary.</p> <p>Prior to construction of the Turning Angle Works, the Proponent must provide a copy of the revised plan including the Turning Angle Works to the Environmental Representative for approval. The ER may approve minor updates to the plan without further consultation with public authorities.</p> <p>Nothing in this condition precludes the Proponent from updating an existing Operational Environment Management Plan, (environmental) management system, existing policies and/or procedures to meet this requirement, providing the Operational Environment Management Plan demonstrates, to the satisfaction of the Planning Secretary, where the relevant conditions of this approval have been addressed.</p> <p>Note: The approval of an Operation Environmental Management Plan does not relieve the Proponent of any requirement associated with this SSI approval. If there is an inconsistency with an approved Operation Environmental Management Plan and the conditions of this SSI approval, the requirements of this SSI approval prevail.</p>	Compliant	26/05/2021

Condition Number	Section	Condition/Compliance Requirement	Status	Completion Date
F3	Operation Environmental Management	<p>Within 15 months of the completion of construction of the SSI, or as otherwise agreed by the Director-General, the Proponent shall commission an independent, qualified person or team to undertake an Operational Performance Audit of the SSI. The independent person or team shall be approved by the Director-General prior to the commencement of the Audit. The Operational Performance Audit Report shall be submitted to the Director-General within one month of the completion of the Audit, unless otherwise agreed by the Director-General. The Audit shall:</p> <p>(a) assess compliance with the requirements of this approval, and other licences and approvals that apply to the SSI;</p> <p>(b) assess the operational performance of the SSI against the predictions made and conclusions drawn in the documents referred to under condition B1 of this approval; and</p> <p>(c) review the effectiveness of the environmental management of the SSI, including any environmental impact mitigation works.</p>	Not triggered	1/02/2017
F4		<p>The Proponent shall undertake a noise and vibration compliance assessment to confirm the predictions of the noise assessment included at B1 and the limits referred to in condition C2. The noise and vibration compliance assessment shall be developed in consultation with the EPA and be undertaken within 12 months of the commencement of operation of the SSI, or as otherwise agreed by the Director General. The assessment shall include, but not necessarily be limited to:</p> <p>(a) noise and vibration monitoring and compliance assessment, to assess compliance with conditions C1 and C2 of this approval;</p> <p>(b) methodology for assessment, including the assessment of worst-case scenarios;</p> <p>(c) details of any complaints received relating to operational noise and vibration impacts;</p> <p>(d) any required recalibration of the noise and vibration model;</p> <p>(e) consideration of the cumulative noise and vibration impacts associated with the Project and the proposed ARTC Hexham Relief Roads project;</p> <p>(f) consideration of noise impacts to the Hexham Swamp Reserve with reference to the passive recreation criteria under the INP;</p> <p>(g) an assessment of the performance and effectiveness of the applied noise and vibration mitigation measures; and</p> <p>(h) identification, if required, of further noise and vibration mitigation measures to meet the requirements of C1 and C2 of this approval.</p> <p>A Noise and Vibration Compliance Assessment Report providing the results of the assessment shall be submitted to the Director-General and the EPA within 60 days of its completion. If the assessment indicates an exceedance of the noise and vibration objectives identified, the Proponent shall implement further feasible and reasonable measures (where required) to mitigate these exceedances in consultation with affected property owners. If there is a dispute regarding the implementation of at-receiver treatments, either party may refer the matter to the Director-General for resolution whose decision shall be final.</p>	Not triggered	29/03/2017
F4(a)		<p>The Proponent shall undertake a noise and vibration compliance assessment, consistent with the requirement of condition F4 to include the Turning Angle Works within 12 months of the commencement of operation of the Turning Angle Works.</p>	Not triggered	5/10/2021
F5		<p>A Flood Review Report shall be prepared following each of the following flood events at the SSI site – 1%, 2%, 5% and 10% AEP flood events to assess the actual flood impacts against those predicted in Appendix D of the Preferred Infrastructure Report referred to in condition B1(c) and the Modification Report referred to in condition B1(d). The Report shall be prepared by an appropriately qualified person(s) and include:</p> <p>(a) Identification of the properties and infrastructure affected by flooding during the reportable event;</p> <p>(b) A comparison of the actual extent, level and duration of the flooding event against the impacts predicted in Appendix D of the document referred to in condition B1(c);</p> <p>(c) Where the actual extent and level of flooding exceeds the predicted level with the consequent effect of adversely impacting on property(ies), structures and infrastructure,</p> <p>identification of the measures to be implemented to reduce future impacts of flooding including the timing and responsibilities for implementation. Flood mitigation measures shall be developed in consultation with the affected property/structure/infrastructure owners, the Water Group and City of Newcastle.</p>	Not triggered	Ongoing

*RED TEXT – Text inserted into MPO7_0171 as part of MOD 1

GREY TEXT – Condition not applicable to the Turning Angle

APPENDIX B – Non-Compliances Register

Condition Number	Condition	Non-Compliance Details	Status	Reported to	Reported on	Incident Date	Action	Action Date
C19	Surface and Groundwater Monitoring Program	Turbidity and DO field readings not taken for multiple monitoring events due equipment failure. All lab analysis was undertaken. Refer to Appendix C for full details.	Non-Complaint	DPE	06/03/2023	Multiple	Engaged contractor continues to review that field probe is maintained. Where these unexpectedly fail lab results are available which are more accurate and relied upon for reporting.	Ongoing
D5	Compliance Tracking	Aurizon wrongly adopted the Compliance Reporting: Post Approval Requirements (DP&E, May 2020) assuming they were an updated version of the Compliance Reporting Post Approval Requirements (Department of Planning, 2018). As such the provided Compliance and Reporting Program included in the CEMP approved by the DP&E is not compliant with the Approval.	Non-Complaint	DPE	24/04/2023	09/11/2022	Identified and reported to the DPE. The 2018 reporting guidelines have now been adopted and will be used moving forward.	April 2023
D5(a)	Compliance Tracking	Aurizon wrongly adopted the Compliance Reporting: Post Approval Requirements (DP&E, May 2020) assuming they were an updated version of the Compliance Reporting Post Approval Requirements (Department of Planning, 2018). Due to incorrect reporting requirements being adopted a pre-construction compliance report has not been issued.	Non-Complaint	DPE	24/04/2023	09/11/2022	Identified and reported to the DPE. The 2018 reporting guidelines have now been adopted and will be used moving forward.	April 2023

Condition Number	Condition	Non-Compliance Details	Status	Reported to	Reported on	Incident Date	Action	Action Date
D5(c)	Compliance Tracking	The pre-construction compliance report has not been issued and as such has not been made publicly available.	Non-Complaint	DPE	24/04/2023	09/11/2022	Identified and reported to the DPE. The 2018 reporting guidelines have now been adopted and will be used moving forward.	April 2023
D5(d)	Compliance Tracking	Aurizon wrongly adopted the Compliance Reporting: Post Approval Requirements (DP&E, May 2020) assuming they were an updated version of the Compliance Reporting Post Approval Requirements (Department of Planning, 2018). As such the provided Compliance and Reporting Program included in the CEMP approved by the DP&E is not compliant with the Approval.	Non-Complaint	DPE	24/04/2023	21/10/2022	Identified and reported to the DPE. The 2018 reporting guidelines have now been adopted and will be used moving forward.	April 2023

APPENDIX C – Hexham TSF Annual Water Monitoring Report
2022 (GHD, February 2023)



Annual Water Monitoring Report 2022

Hexham Train Support Facility

Aurizon Operations Limited

21 February 2023

→ **The Power of Commitment**



GHD Pty Ltd | ABN 39 008 488 373

GHD Tower, Level 3, 24 Honeysuckle Drive
Newcastle, New South Wales 2300, Australia

T +61 2 4979 9999 | **F** +61 2 9475 0725 | **E** ntlmail@ghd.com | **ghd.com**

Document status

Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4	0	L Parkinson	L Maranciak		A Barron		21/02/23

© GHD 2023

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Executive summary

Aurizon Operations Limited (Aurizon) engaged GHD Pty Ltd (GHD) to conduct water quality monitoring at their Hexham NSW Long Term Train Support Facility (TSF) (the Site). The scope of work includes surface and groundwater monitoring in accordance with the requirements of Operational Environment Management Plan (OEMP) and subsequent reporting of results. This report summarises the surface and groundwater conditions at the Site over the 2022 monitoring period.

The Site's monitoring network comprises 11 groundwater wells and 15 surface water (SW) locations (Figure 1.1). Surface and groundwater monitoring is required on a quarterly basis, with additional surface water field monitoring undertaken on a monthly basis. Surface water monitoring is also required in response to high rainfall events (greater than 75 mm of rainfall over a period of five consecutive days).

This report incorporates data and information detailed in the following 2022 quarterly monitoring reports previously submitted to Aurizon:

- GHD (2022a) Aurizon Hexham Compliance Water Monitoring, Quarterly Water Monitoring – Q1 2022. 2 May 2022.
- GHD (2022b) Aurizon Hexham Compliance Water Monitoring, Quarterly Water Monitoring – Q2 2022. 15 July 2022.
- GHD (2022c) Aurizon Hexham Compliance Water Monitoring, Quarterly Water Monitoring – Q3 2022. 30 September 2022.
- GHD (2023a) Aurizon Hexham Compliance Water Monitoring, Quarterly Water Monitoring – Q4 2022. 06 February 2023.

The objectives of the surface water and groundwater monitoring program were to complete the sampling regime in accordance with the OEMP and ensure operational compliance. The overarching objective is to maintain environmental standards and inform management of potential water-related environmental risks should they arise.

The 2022 monitoring program indicated most contaminants of potential concern (COPC) were below the adopted site criteria, with some exceedances occurring within metal, nutrient, and coliform suites. Still, most of these exceedances remained within historical ranges with a few exceptions, specifically cadmium, iron, nitrogen, and thermotolerant coliforms. Generally, these results appeared to be spike occurrences; however, some increasing trends have been noted at select locations for some heavy metals in surface water, nitrogen (surface water and groundwater), and thermotolerant coliforms in surface water. Such increases are considered the result of increased rainfall runoff and will be reviewed in 2023.

This report is subject to, and must be read in conjunction with, the limitations set out in Section 8 and the assumptions and qualifications contained throughout the Report.

Glossary

Abbreviation	Description
ALS	Australian Laboratory Services
ANZECC	Australian and New Zealand Environment and Conservation Council
BOD	Biological oxygen demand
BOM	Bureau of Meteorology
BTEXN	Benzene, toluene, ethylbenzene, xylenes and naphthalene
CFU	Colony-forming unit
COC	Chain of custody
COPC	Contaminants of potential concern
DO	Dissolved oxygen
DP&E	Department of Planning and Environment
DQI	Data quality indicator
DQO	Data quality objective
DTW	Depth to water
EC	Electrical conductivity
EPA	NSW Environment Protection Authority
GME	Groundwater monitoring event
HSE	Health Safety and Environment
JSEA	Job Safety Environmental Analysis
LNAPL	Light non-aqueous phase liquid
LOR	Limit of reporting
m bgl	Metres below ground level
m bTOC	Metres below top of casing
ME	Monitoring event
MHL	Manly Hydraulics Laboratory
mg/L	Milligrams per litre
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
OEMP	Operational Environment Management Plan
OSGMP	Operational Surface and Groundwater Management Plan
PAH	Polycyclic aromatic hydrocarbon
QA/QC	Quality assurance/quality control
REDOX	Oxidation-reduction potential
RPD	Relative Percent Difference
SFOP	Standard field operating procedures
SW	Surface water
SWL	Standing water level

Abbreviation	Description
TOC	Top of casing
TRH	Total recoverable hydrocarbons
TSF	Train Support Facility
TSS	Total suspended solids
µg/L	Micrograms per litre

Contents

1.	Introduction	1
1.1	Objectives	1
1.2	Scope of work	1
1.3	Limitations	2
2.	Site description	4
2.1	Site identification	4
2.2	Site operations	4
2.3	Surrounding land use and zoning	5
2.4	Weather station data review	5
2.5	2022 Monitoring program	6
3.	Assessment criteria	7
3.1	Laboratory analysis	8
4.	Quality assurance/quality control	10
4.1	Quality systems	10
4.2	Quality assurance	10
4.3	Field QA/QC	10
	4.3.1 Relative percentage differences	11
	4.3.2 Rinsate and field blanks	11
4.4	Laboratory QA/QC	11
4.5	QA/QC Summary	11
5.	Annual results	12
5.1	Surface water	12
5.2	Groundwater	13
6.	Compliance statement	14
6.1	Summary compliance during the monitoring period	14
6.2	Review of monitoring program suitability	15
6.3	Future monitoring	15
6.4	Potential Work, Health & Safety (WHS) issues	15
7.	References	16
8.	Limitations	17

Table index

Table 2.1	Site identification details	4
Table 2.2	Description of surrounding land use and respective zonings	5
Table 2.3	2022 Monitoring program field works	6
Table 3.1	Surface and groundwater discharge criteria	7
Table 3.2	Hexham water quality analytical suite	8
Table 4.1	QC sampling schedule	10
Table 4.2	QC sample summary	11
Table 6.1	Monitoring compliance 2022 summary	14

Figure index

Figure 1.1	Surface and groundwater monitoring locations	3
Figure 2.1	2022 Annual rainfall summary – Hexham Bridge (Station 210448)	6

Appendices

Appendix A	Annual results summary tables
Appendix B	Historical trend analysis graphs
Appendix C	Data quality objectives
Appendix D	Quarterly sampling methodology
Appendix E	Laboratory reports
Appendix F	Field sheets
Appendix G	Calibration certificates
Appendix H	Photo log

1. Introduction

Aurizon Operations Limited (Aurizon) engaged GHD Pty Ltd (GHD) to conduct water quality monitoring at their Hexham NSW Long Term Train Support Facility (TSF) (the Site). The scope of work includes surface and groundwater monitoring in accordance with the requirements of Operational Environment Management Plan (OEMP) and subsequent reporting of results. This report summarises the surface and groundwater conditions at the Site over the 2022 monitoring period.

The Site's monitoring network comprises 11 groundwater wells and 15 surface water (SW) locations (Figure 1.1). Surface waters comprise 12 flow sites, rainfall permitting, and three onsite water storage basins. Surface and groundwater monitoring is required on a quarterly basis, with additional surface water field monitoring undertaken on a monthly basis. Surface water monitoring is also required in response to high rainfall events.¹

Water monitoring at the site is undertaken in accordance with the requisites of the Operational Surface and Groundwater Management Plan (OSGMP) (Aurizon, 2021b). Section 2 of the OSGMP states the requirement for surface and groundwater monitoring during the operational phase of Hexham TSF.

This report incorporates data and information detailed in the following 2022 quarterly monitoring reports previously submitted to Aurizon:

- GHD (2022a) Aurizon Hexham Compliance Water Monitoring, Quarterly Water Monitoring – Q1 2022. 2 May 2022.
- GHD (2022b) Aurizon Hexham Compliance Water Monitoring, Quarterly Water Monitoring – Q2 2022. 15 July 2022.
- GHD (2022c) Aurizon Hexham Compliance Water Monitoring, Quarterly Water Monitoring – Q3 2022. 30 September 2022.
- GHD (2023a) Aurizon Hexham Compliance Water Monitoring, Quarterly Water Monitoring – Q4 2022. 06 February 2023.

1.1 Objectives

The objectives of the surface water and groundwater monitoring program were to complete the sampling regime in accordance with the OEMP and ensure operational compliance. The overarching objective is to maintain environmental standards and inform management of potential water-related environmental risks should they arise.

1.2 Scope of work

The scope of work completed during 2022 comprised the following:

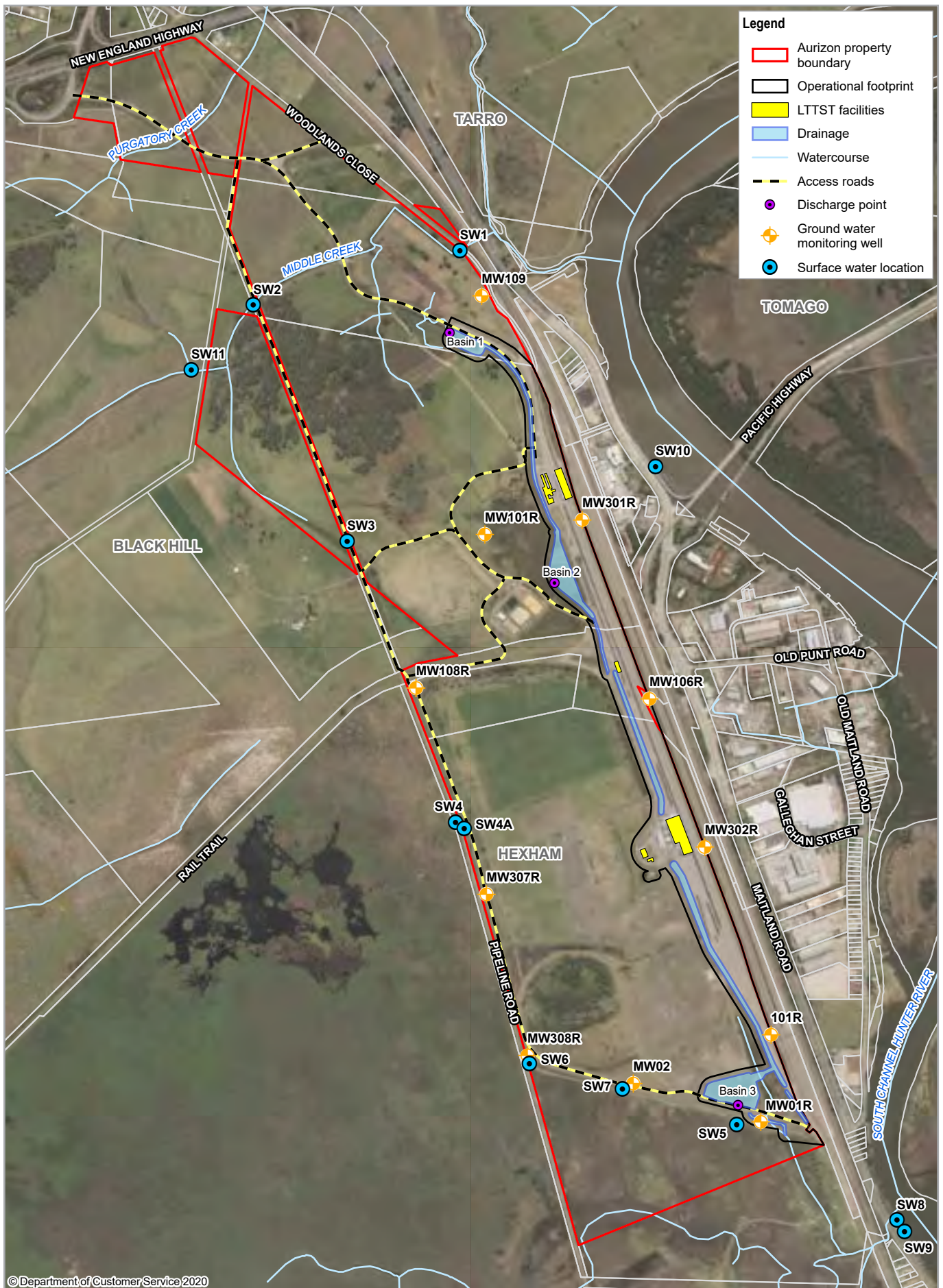
- Preparation of Job Safety Environmental Analysis (JSEA) documentation for each monitoring event completed during 2022.
- Four quarterly groundwater monitoring events (GME) (March, June, September, and December) comprising gauging and sampling of 11 groundwater monitoring wells; and inspection and subsequent sampling of 15 surface waters where and when water volumes permit.
- Monthly SW monitoring of three basins (reading of field parameters only).
- Five rainfall response events (March (two events), May, July, and October) comprising inspection and sampling of 15 SW sites as a result of rainfall exceeding 75 mm over a 5-day period, as per the OSGMP requirements.
- Laboratory analysis of SW and groundwater samples as specified in Section 3.
- Quality assurance (QA) programs for each sampling event.
- Quality control (QC) sampling in the quarterly GMEs.

¹ Greater than 75 mm of rainfall over a period of five consecutive days

- Comparison of monitoring results to Site specific criteria.
- Historical water quality trend review.
- Preparation of quarterly monitoring reports and this annual report.

1.3 Limitations

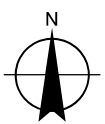
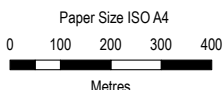
This report is subject to the limitations provided in Section 8.



Legend

- Aurizon property boundary
- Operational footprint
- LTTST facilities
- Drainage
- Watercourse
- Access roads
- Discharge point
- ◆ Ground water monitoring well
- Surface water location

© Department of Customer Service 2020



Aurizon Operations Limited
Aurizon Hexham Compliance Water Monitoring

Project No. 22-19516
Revision No. 0
Date 05/09/2022

**Surface and Groundwater
Monitoring Locations**

FIGURE 1

2. Site description

The site is located along Maitland Road, Hexham, and is accessed via Pipeline Road to the north. The TSF has been developed on a 38-hectare (ha) portion of the site, parallel to the Main Northern Railway to the east. The remainder of the site is vacant and consists of cleared grassland.

2.1 Site identification

The site identification details are summarised in Table 2.1.

Table 2.1 Site identification details

Item	Description
Site Name	NSW Long Term Train Support Facility
Street Address	Maitland Rd, Hexham NSW 2322
Certificate of Title Details (Vol/Folio) and Parcel/ Lot Number	Lot 11 and 12 DP 1236873 Lot 101 to 106 DP 1189565 Lot 1 DP 155530 Lot 104 DP 1084709 Lot 2 DP 735456 Lot 10 DP 735235 Lot 102 DP 1084709
Area	255 ha
Property Occupier	Aurizon
Current Use	Provisioning (locomotive) and maintenance (locomotive and wagon)
Site Zoning	Coal stockpile area – IN3 (heavy Industry). Hexham Swamp – E1 (National Park and Nature Reserves). Main Northern Railway – SP2 (Infrastructure/Railway) (as per Newcastle Council LEP 2012)

2.2 Site operations

The key operational components of the site include:

- New connections to the Great Northern Railway.
- Train tracks parallel to the existing mainline and a shunt track at the northern part of the facility comprising 10.5 kilometres of railway track.
- A rail line turning angle in the southern portion of the site to allow locomotive turn arounds.
- A provisioning building, a combined maintenance and administrative centre, service vehicle garage, and bulk fuel storage area.
- Vehicular intersection and new road from the Tarro interchange and sealed internal access roads.
- A wastewater treatment plant with on-site effluent irrigation.

The following overview of site water management has been taken from the 2017 Annual Water Monitoring Report (Aurizon, 2018).

“Water across the site is generally managed in accordance with the approved Operational Surface and Groundwater Management Sub-Plan (OSGMP) and Operational Stormwater Management Sub-Plan (OSWMP) which form appendices to the approved OEMP. Swales constructed for the TSF which drain the rail formation and other operational areas of the facility convey water to one of three Water Quality Control Basins (Basins). Groundwater and surface water are not permitted to mix in any of the three Basins. During construction, the presence of perched groundwater within the coal wash reject emplacement led to changes in design to achieve this desired outcome without facilitating the egress of groundwater off the site, and this improvement continues to support water quality management in the operational phase.”

2.3 Surrounding land use and zoning

The surrounding land uses are summarised below in Table 2.2.

Table 2.2 Description of surrounding land use and respective zonings

Orientation	Description of Surrounding Land Use	Zoning (Newcastle Council LEP 2012)
North	Cleared grazing land, followed by Woodlands Close and Pacific highway, Hunter Water’s CTGM, then residential properties and Main Northern Railway	E2 (Environmental Conservation), SP2 (Infrastructure/Railway), E3 (Environmental Management)
East	Main Northern Railway, Pacific Highway and then industrial properties	SP2 (Infrastructure/Railway), IN3 (heavy industry)
South	Cleared grazing land, Hunter Water’s CTGM, followed by Hunter Wetlands	E2 (Environmental Conservation), E1 (National Park and Nature Reserves)
West	Hunter Wetlands National Park	E1 (National Park and Nature Reserves)

2.4 Weather station data review

Rainfall data was obtained from the NSW Manly Hydraulics Laboratory (MHL) database for Hexham Bridge (station number 210448) between 1 January 2022 to 31 December 2022. Hexham Bridge station recorded a total annual rainfall of 1389.5 mm for 2022, which was higher than the total for 2021 of 1114 mm. A summary of the Hexham Bridge rainfall data for 2022 is presented below in Figure 2.1.

As stipulated in the OSGMP, greater than 75 mm of rainfall over a period of five consecutive days is considered significant rainfall and triggers the requirement for surface water monitoring. GHD tracks rainfall via the MHL website (www.mhl.nsw.gov.au/Station-210448) which provides live records for a 5-day period only. Based on this tracking, five significant rainfall events were recorded in 2022, triggering the requirement for rainfall response surface water monitoring completed 9 March, 29 March, 30 May, 6 July and 11 October. (Figure 2.1).

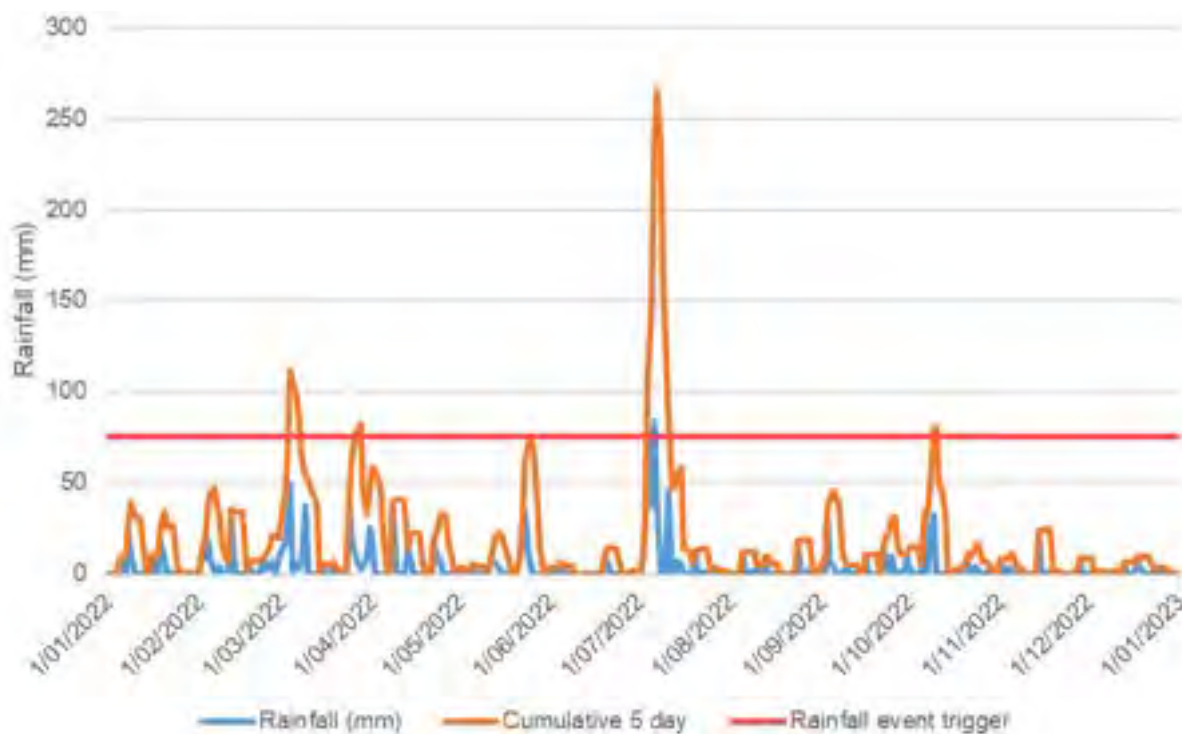


Figure 2.1 2022 Annual rainfall summary – Hexham Bridge (Station 210448²)

2.5 2022 Monitoring program

The field works completed as part of the 2022 monitoring program are provide in Table 2.3.

Table 2.3 2022 Monitoring program field works

Date	Field works completed	Associated Report
18 January 2022	Monthly surface water monitoring	GHD, 2022a
28 February 2022	Monthly surface water monitoring	
9 March 2022	Rainfall monitoring event	
24 March 2022	Quarterly monitoring	
29 March 2022	Rainfall monitoring Completion of 1Q (March) surface water sampling ³	
7 April 2022	Monthly surface water monitoring Completion of 1Q (March) groundwater monitoring ³	GHD, 2022a and 2022b
4 May 2022	Monthly surface water monitoring	
30 May 2022	Rainfall monitoring	
15 June 2022	Quarterly monitoring	
6 July 2022	Rainfall monitoring	GHD, 2022c
18 July 2022	Monthly surface water monitoring	
8 August 2022	Monthly surface water monitoring	
1 September 2022	Quarterly monitoring	
11 October 2022	Rainfall monitoring	GHD, 2023a
17 October 2022	Monthly surface water monitoring	
3 November 2022	Monthly surface water monitoring	
7-8 December 2022	Quarterly monitoring	

² Source: <http://www.mhl.nsw.gov.au/Site-210448>.

³ Due to significant delays caused by unforeseen traffic, the quarterly sampling was conducted over three days- 24 March, 29 March, and 07 April.

3. Assessment criteria

Discharge criteria were developed for Aurizon by Douglas Partners (February 2014) based on the *Australian and New Zealand Guidelines for Fresh Water Quality* 95% species protection levels (ANZECC, 2000). The ANZECC 95% investigation levels apply to typical slightly to moderately disturbed fresh waters systems. Discharge criteria were issued to Department of Planning and Environment (DP&E) and approved as a component of the OSGMP.

Discharge criteria were categorised as A, B or C, based on the receiving environment:

- Category A (DCA) applies to Discharge Locations 1, 2 and 3 of the OSGMP. These locations discharge from the site to the Hunter River, via Middle Creek. The monitoring locations include SW1 (Middle Creek downstream of the project), SW2 (Middle Creek upstream of the project), and SW3 (culvert under Hunter Water easement that flows to Middle Creek). Additional surface water sampling locations added to the program post initiation also subject to category A criteria include SW8, SW9, SW10 and SW11.
- Category B (DCB) applies to Discharge Locations 4, 5 and 6 of the OSGMP. These locations discharge from the site to Hexham Swamp. The monitoring locations include SW4 and SW4A (western border of Aurizon’s land), SW5 (south-east corner of the project), and SW6 (south-west corner of Aurizon’s land), Basin 1 (north-east of Aurizon site along access road), Basin 2 (Within grassland on-site in Aurion’s land), and Basin 3 (Opposite SW5). SW7 was added as an additional surface water sampling location post initiation which is also subject to category B.
- Category C (DCC) applies to the on-site disposal of water by infiltrating to ground. There is currently no such practice occurring onsite however the criteria continue to be used for groundwater quality assessment. Category C criteria apply to all groundwater monitoring wells (101R, MW01R, MW02, MW101R, MW106R, MW108R, MW109, MW301R, MW302R, MW307R and MW308R).

The applicable guideline values (assessment criteria) are presented below in Table 3.1, along with the corresponding measurement units.

Table 3.1 Surface and groundwater discharge criteria

Analyte	Units	Category A [#]	Category B [#]	Category C [^]	ANZECC 2000
Conductivity	µS/cm	40000	6000	20500	NC
pH	pH Units	6.5 - 8.5	5.5 - 8.5	5.5 - 8.5	6.5 - 8.5
Aluminium (Al)	mg/L	2.5	2.5	0.055	0.055
Arsenic (As)	mg/L	0.013	0.013	0.013	0.013
Cadmium (Cd)	mg/L	0.0002	0.0002	0.0002	0.0002
Chromium (Cr)	mg/L	0.004	0.002	0.002	0.001
Copper (Cu)	mg/L	0.0045	0.0026	0.0071	0.0014
Iron (Fe)	mg/L	35	1.3	350	0.3
Lead (Pb)	mg/L	0.0044	0.0034	0.0034	0.0034
Mercury (Hg)	mg/L	0.0006	0.0006	0.0006	0.0006
Nickel (Ni)	mg/L	0.017	0.011	0.18	0.011
Zinc (Zn)	mg/L	0.054	0.019	0.65	0.008
Ammonia	mg/L	0.9	0.9	25	0.9
Turbidity	NTU	60	50	1200	50
Total Susp. Solids	mg/L	50	40	650	NC
TKN	mg/L	8	4	12	NC
Total Nitrogen	mg/L	10	4	12	0.5

Analyte	Units	Category A* #	Category B* #	Category C* ^	ANZECC 2000
Total Phosphorus	mg/L	2.75	1.9	14.5	0.05
Faecal Coliforms	CFU/ 100mL	1500	500	2000	150
BOD	mg/L	40	15	30	15
TRH C ₆ -C ₃₆ **	mg/L	0.15	0.15	0.3	NC
Naphthalene	mg/L	0.05	0.05	0.05	0.05
Phenanthrene	mg/L	0.0006	0.0006	0.0015	0.0006
Anthracene	mg/L	0.0006	0.0006	0.00095	0.00001
Fluoranthene	mg/L	0.001	0.001	0.0015	0.001
Benzo(a) pyrene	mg/L	0.0006	0.0001	0.0007	0.0001
Total PAHs	mg/L	0.01	0.0015	0.02	NC
Benzene	mg/L	0.95	0.95	0.95	0.95
Ethyl Benzene	mg/L	0.08	0.08	0.08	0.08
Toluene	mg/L	0.18	0.18	0.18	0.18
Xylenes (total)	mg/L	0.625	0.625	0.625	0.625

*Category A (Hunter River): Discharge Locations 1, 2 and 3 (SW1 to SW3, SW8 to SW11)

*Category B (Hexham Nature Reserve): Discharge Locations 4, 5 and 6 (SW4 to SW7 and Basin 1 to Basin 3)

*Category C (controlled on site infiltration in designated bunded area)

Total metals

^ Filtered metals

**Total sum not reported by laboratory therefore criteria compared to sum reported for TRH C₁₀-C₃₆ fraction, notably to the exclusion of TRH C₆ - C₉. However, this is inconsequential in this instance as TRH C₆ - C₉ fraction is <LOR.

3.1 Laboratory analysis

Water samples were submitted to laboratories accredited by the National Association of Testing Authorities (NATA). Primary samples were submitted to Eurofins Mgt (Eurofins) and secondary samples to ALS Environmental (ALS). The laboratory analytical suite performed was consistent with the requirements of the OEMP (Table 3.2).

All LORs were below their respective assessment criteria over the annual monitoring period except for the following PAHs:

- Anthracene
- Benzo(a)pyrene
- Phenanthrene (surface water samples only)

Table 3.2 Hexham water quality analytical suite

Parameter		Primary Laboratory Limit of Reporting (Eurofins) ²	Units
Physico-chemical	BOD	5	mg/L
	Conductivity	10	µS/cm
	pH	0.1	pH Units
	Turbidity	1	NTU
	Total Suspended Solids	5	mg/L

Parameter		Primary Laboratory Limit of Reporting (Eurofins) ²	Units
Heavy Metals ¹	Aluminium	0.05	mg/L
	Arsenic	0.001	mg/L
	Cadmium	0.0002	mg/L
	Chromium	0.001	mg/L
	Copper	0.001	mg/L
	Iron	0.05	mg/L
	Lead	0.001	mg/L
	Mercury	0.0001	mg/L
	Nickel	0.001	mg/L
	Zinc	0.005	mg/L
Organics	TKN	0.2	mg/L
	Total Nitrogen	0.2	mg/L
	Total Phosphorus	0.01	mg/L
Microbiological	Faecal Coliforms	1	cfu/100mL
Total hydrocarbon fractions	TRH C6-C36	Various	µg/L
Polycyclic aromatic hydrocarbons	Naphthalene	1	µg/L
	Phenanthrene	1	µg/L
	Anthracene	1	µg/L
	Fluoranthene	1	µg/L
	Benzo(a) pyrene	1	µg/L
	Total PAHs	1	µg/L
Volatile hydrocarbons	Benzene	1	µg/L
	Ethyl Benzene	1	µg/L
	Toluene	1	µg/L
	Xylenes (total)	3	µg/L
	Naphthalene	1	µg/L

- ¹Metals analysis is total and dissolved for surface water and groundwater, respectively.
- ²Shaded cells indicate an LOR which is above some of the site assessment criteria.

4. Quality assurance/quality control

A QA program inclusive of QC sampling was completed as part of each quarterly event, and details of the QA programs have been presented in the four quarterly reports (GHD 2022a, 2022b, 2022c, and 2023a). An overarching summary of the QA program is presented in the following sub-sections.

4.1 Quality systems

GHD operates under a Practice of Quality Management System certified to AS/NZS ISO 9001:2015 and an Environmental Management System certified to ISO 14001:2015.

The Quality and Environmental management systems prescribe a structured approach to quality and environmental management which covers:

- Job establishment and planning
- Document control
- Design control and review
- Verification of deliverables
- Job records
- Internal project compliance audits
- The identification and management of significant environmental risks

4.2 Quality assurance

A series of QA procedures were implemented to maintain the quality of data collected by GHD staff. QA procedures included:

- Use of standardised field sampling forms
- Use of standardised field sampling methods
- Documenting calibration and use of field instruments
- Collection of QC samples
- Use of laboratory supplied sampling containers and appropriate storage
- Collection of field duplicates and inter-laboratory duplicates
- A review of the data for potentially erroneous and/or outlier results by comparison to historical data

Data quality objectives are summarised in Appendix C. Sampling methodology is presented in Appendix D.

4.3 Field QA/QC

An evaluation of QA/QC was based on the collection and analysis of the QC samples outlined in Table 4.1. A summary of QC samples collected in 2022 is presented in Table 4.2.

Table 4.1 QC sampling schedule

Monitoring event	QC Samples	Analysis
Q1 to Q4 monitoring events	Duplicates (1 x inter-laboratory and 1 x intra-laboratory)	BTEXN, TRH, PAHs, heavy metals and nutrients
	Rinsate blank	BTEXN, TRH, PAHs, heavy metals and nutrients
Q4 monitoring event	1 x Field Blank ⁴	BTEXN, TRH, PAHs, heavy metals and nutrients

⁴ See Section 4.3.2 for more information on sampling rationale.

Table 4.2 QC sample summary

Monitoring event	QC Sample Type		
	Duplicate : Primary	Rinsate Blank	Field Blank
Q1	2 : 24	2 samples collected, 3 detects ¹	-
Q2	2 : 24	1 sample collected, 2 detects ²	-
Q3	2 : 24	1 sample collected, 3 detects ³	-
Q4	2 : 24	2 samples collected, 1 detect ⁵	1 sample collected, 0 detects

¹ Samples RB01 and RB02 detected trace levels of phosphate (as P) or total nitrogen (as TKN and NOX).

² Sample RB01 detected trace levels total nitrogen (as TKN and NOX).

³ Sample RB01 detected trace levels of total phosphorus and total nitrogen (as TKN and NOX).

⁵ Sample RB02 detected trace levels of total phosphorus.

4.3.1 Relative percentage differences

An evaluation of relative percentage difference results for Q1 to Q4 monitoring events are detailed in the respective quarterly reports (GHD 2022a, 2022b, 2022c, and 2023a). The RPD exceedances observed over the 2022 monitoring period were not considered significant, and the primary results were considered valid.

4.3.2 Rinsate and field blanks

Generally, one rinsate blank was submitted to the laboratory during each monitoring event, in accordance with Table 4.2. During the Q1 and Q4 events, two rinsate blanks were submitted as the event was conducted over multiple days. Nutrients (nitrogen and/or total phosphorus) were detected at low levels during each monitoring event, consistent with the 2021 monitoring period.

During the Q4 monitoring event, a field blank sample was collected using the laboratory supplied rinsate water to assess if the previously reported low detections were potentially arising from site atmospheric contributions or the supplied water itself. All analytes were reported below the LOR confirming rinsate detections arose from the sampling equipment. The low-level detections (generally at LOR, <1 mg/L), although not ideal, have not affected the decision rule in any instance. Further, nutrient assessment criteria exceedances for 2022 are consistent with historical records.

Following the observed rinsate detections, site decontamination procedures were reviewed, and improvements made to prevent future detections. Rinsate blank detections will continue to be monitored in 2023 to determine if any further changes to the decontamination procedures are required.

4.4 Laboratory QA/QC

QC sample analysis was also completed by the contracted laboratories in accordance with their NATA accreditation as laboratories suitable for environmental contaminant analysis. Laboratory QC sample analysis comprised duplicates, method blanks, control samples, laboratory-controlled spikes, matrix spikes, and sample surrogates. All QC sample results were accepted for each ME, as detailed within each quarterly report.

4.5 QA/QC Summary

From the review of the QA/QC program for 2022, surface and groundwater analytical data were concluded to be of acceptable quality upon which to draw meaningful conclusions regarding impacts to surface and groundwater at the site.

5. Annual results

Notable surface water and groundwater results for 2022 are highlighted in the sub-sections below (5.1 and 5.2, respectively). Further detail can be found in the respective quarterly reports.

Long-term analyte trends are assessed using time series graphs for data from December 2015 to December 2022. Graphics have only been prepared for analytes that have exceeded respective adopted criteria within this period (Appendix B).

5.1 Surface water

A complete annual record of field parameters and analytical results for surface water is presented in Appendix A, Table 2A and Table 2B. The following key findings were noted in 2022:

- Field pH ranged within the adopted assessment criteria between 5.4 to 7.9 pH units, at all locations except for SW1 and SW7, which recorded pH values of 6.4 and 5.4 during the 6 July and 11 October events, respectively. Both pH exceedances (below the adopted criteria) were within historical ranges. These results were not replicated during the subsequent monitoring events, which reported pH values within the adopted assessment criteria at both monitoring locations.
- Field EC ranged from 5.8 to 26254 $\mu\text{S}/\text{cm}$ (fresh to saline) during 2022. Concentrations were below the adopted assessment criteria at all monitoring locations and generally consistent with those reported for the previous year (2021), with some select locations recording concentrations outside of historical ranges, which appeared to be isolated, returning to historical levels during the subsequent event.
- Laboratory turbidity and total suspended solid (TSS) concentrations varied without trend throughout 2022 at several locations and intermittently exceeded assessment criteria, with the exception of repeated exceedances at SW4, SW4A and SW5 generally consistent with historical records. The presence of livestock proximal to sampling points and the influence of rainfall are considered possible causes for the fluctuation (e.g., concentration spikes occurring following significant rainfall).
- Iron concentrations were above Site assessment criteria at surface water locations SW4, SW4A, SW5, SW6, SW7, and Basins 1, 2, and 3 throughout 2022, with locations Basin 1, Basin 2, SW4, SW4A, SW5, and SW6 recording their highest levels of total iron to date. The concentrations at these locations fell in subsequent sampling events, with the exception of Basin 1 which recorded its maximum during December 2022. Iron concentrations reported at Basin 3, SW4, SW4A, SW5, SW6 and SW7 have generally exceeded the adopted site assessment criteria in recent years and show some increasing trends.
- Most metal concentrations were generally consistent with historical records. Exceedances of several heavy metals including aluminium, copper, lead, nickel and zinc at SW5 and Basin 1 and lead at SW3 and SW7, have shown increasing trends since 2020. These exceedances are likely related to high TSS and turbidity.
- Nitrogen concentrations were generally below the Site assessment criteria except for an isolated spike recorded at SW1 (Q3 monitoring event), and sporadic exceedances at SW4, SW4A, SW5, Basin 1 and Basin 2. Exceedances occurred in continuation to 2021 records, largely stabilising at most locations with the exception of Basin 1. These exceedances typically coincided with increased rainfall at the SW locations, but not generally at basin locations. Concentrations will continue to be reviewed in 2023 to ascertain whether increased concentrations continue at Basin 1.
- Concentrations of BTEXN and PAHs⁵ were below the Site assessment criteria and/or the laboratory LOR at all surface water monitoring locations during 2022, consistent with historical data.
- Some detections of TRH fractions were noted at SW1, SW2, SW3, SW5, SW7, SW11, and all three basins. consistent with historical intermittent detections. There are no assessment criteria for TRH fractions. No increasing trends are apparent.
- Thermotolerant coliform concentrations during 2022 were generally consistent with historical records. Isolated spikes were recorded at Basin 2 and SW3 (7700 cfu/100 mL), SW4 (12000 and 17000 cfu/100mL) and SW4A (14000 and 9000 cfu/100mL) which may reflect influence from adjacent agricultural areas (i.e., faecal matter from livestock). Concentrations at location SW4A, Basin 1 and Basin 3 appear to be increasing and will continue to be monitored in 2023.

⁵ Noting LORs for Anthracene, Benzo(a) pyrene and Phenanthrene exceed the assessment criteria and no definitive conclusion can be made regarding compliance levels of these analytes.

5.2 Groundwater

A complete annual record of field parameters and analytical results for groundwater are presented in Appendix A, Table 2C. The following key findings and results were noted during the groundwater monitoring program completed during 2022:

- Field pH ranged 5.0 to 7.9 pH units during 2022. Exceedances of the DCC (below the adopted criteria) were reported at MW01R (5.0 pH units) during the 3Q event, and at MW02 (ranging from 5.0 to 5.3 pH units) during Q1, Q2 and Q3. The low pH value recorded outside of the DCC at MW01R was within historical ranges and does not reflect a worsening trend. The pH value measured during the Q3 event at MW02 (5.0 pH units) was slightly lower than historical levels, but returned to within historical ranges during the Q4 event.
- Field EC ranged 304.1 to 32,001 $\mu\text{S}/\text{cm}$ (fresh to saline) during 2022. EC was below the adopted assessment criteria at all monitoring locations except MW307R during all four quarterly events (ranging 22,034 to 32,001 $\mu\text{S}/\text{cm}$) and MW101R during Q2 (24, 833 $\mu\text{S}/\text{cm}$). Exceedances at MW307R continue an increasing trend observed since June 2020; however, concentrations significantly increased throughout 2022. MW101R has shown isolated exceedances without trend since June 2019. Turbidity and TSS concentrations were below the DCC at all locations, except for an isolated spike in TSS, within the historical range, at MW109 in Q4.
- Exceedances of aluminium, cadmium and copper were observed at select monitoring wells throughout 2022; however, concentrations remained low and stable and within historical ranges, with the exception of the low detection of cadmium at MW308R which was slightly above the LOR in Q3, however dropped below the LOR in Q4.
- Arsenic concentrations at MW02 exceeded the DCC in Q1 (0.015 mg/L), Q2 (0.014 mg/L) and Q4 (0.014 mg/L) but remained within historical ranges. Arsenic at this location has shown a stabilised trend in 2022 and will be monitored in during 2023 to determine if this trend continues.
- Nitrogen concentrations at MW307R exceeded DCC criteria throughout all four quarterly events, and have shown an increasing trend in 2022. Concentrations decreased slightly in Q4 but will continue to be monitored in 2023 to determine if concentrations continue to increase.
- Concentrations of BTEXN and PAHs were reported below site assessment criteria at all groundwater monitoring locations during 2022, consistent with historical records. An isolated detection of toluene occurred in MW106R in Q4 equal to the LOR (1 $\mu\text{g}/\text{L}$). Isolated detections of toluene have occurred previously across the Site; however, this was the first detection at MW106R since monitoring began and will be monitored in 2023 to assess if the result was anomalous.
- TRH (C₁₀-C₃₆) concentrations were below the DCC at all groundwater monitoring locations during 2022.
- Thermotolerant coliform concentrations remained similar to 2021. All detections were below assessment criteria with the exception of MW302R (4900 cfu/100mL) and MW109 (3100 cfu/100mL) during Q1. These concentration spikes are within historical ranges and are considered to result from increased runoff following a period of high rainfall.

6. Compliance statement

All sampling was in accordance with requirements as outlined in the OSGWP. All analysis in 2022 was in accordance with OSGWP requirements except for:

- During the 7 April quarterly monitoring event (the second part of the March quarterly monitoring event), Basin 3, MW308R and MW108R were unable to be gauged for field parameters as the water quality meter was damaged during the heavy rainfall.
- Turbidity readings for SW locations were obtained from the laboratory for the 9 March, 29 March, 7 April monitoring events, and the 30 May rainfall monitoring event as readings for turbidity in the field could not be taken with the supplied water quality meter.
- Field DO was gauged beyond the calibrated range of the field meter at MW01R, MW02, MW307R and MW308R during the 1 September quarterly monitoring event. as the Laboratory DO has been adopted for these locations. The same applied for Basin 1, Basin 2, Basin 3, SW1, SW3, SW4, SW4A, SW5, SW6, SW7 and SW11 during the 11 October rainfall event.

6.1 Summary compliance during the monitoring period

Table 6.1 outlines the compliance monitoring activities completed in 2022, in accordance with the OSGMP requirements.

Table 6.1 Monitoring compliance 2022 summary

Implementation Action	Parameters	Frequency	Compliance
Surface water monitoring sites: SW1, SW2, SW3, SW4, SW4A, SW5, SW6, SW7, SW8, SW9, SW10, SW11	Field parameters ²	Quarterly and rainfall events	<u>Partial</u> Turbidity readings for all monitored SW sites for the 9 March, 29 March, 7 April monitoring events, and the 30 May rainfall monitoring event were obtained from the laboratory as readings for turbidity in the field could not be taken with the supplied water quality meter. DO was not measured during the 11 October rainfall event for SW1, SW3, SW4, SW4A, SW5, SW6, SW7 and SW11 as the measured result was gauged beyond the calibrated range of the field meter, therefore a laboratory DO reading was adopted for these locations.
	Laboratory analytes ¹	Quarterly and rainfall events	<u>Yes</u>
Water quality monitoring of Basins 1 to 3	Field parameters ²	Monthly	<u>Partial</u> Turbidity readings for all monitored basis for the 9 March, 29 March, 7 April monitoring events, and the 30 May rainfall monitoring event were obtained from the laboratory as readings for turbidity in the field could not be taken with the supplied water quality meter. Field parameters ² were not gauged for Basin 3 during the 7 April quarterly monitoring event (the second part of the March quarterly monitoring event) as the water quality meter received water damage on site during heavy rainfall. DO was not measured during the 11 October rainfall event (for Basin 1, Basin 2, Basin 3) as the measured result was gauged beyond the calibrated range of the field meter, therefore a laboratory DO reading was adopted for these locations.
	Laboratory analytes ¹	Quarterly and rainfall	<u>Yes</u>

Implementation Action	Parameters	Frequency	Compliance
Groundwater monitoring wells: 101R, MW01R, MW02, MW101R, MW106R, MW108R, MW109, MW301R, MW302R (FD01 and FD02), MW307R, MW308R	Field parameters ¹	Quarterly	<u>Partial</u> Field parameters ² were not gauged for MW308R and MW108R during the 7 April quarterly monitoring event (the second part of the March quarterly monitoring event) as the water quality meter received water damage on site during heavy rainfall. DO was not measured for MW01R, MW02, MW307R and MW308R during the 1 September quarterly monitoring event as the measured result was gauged beyond the calibrated range of the field meter, therefore a laboratory DO reading was adopted for these locations.
	Laboratory analytes ²	Quarterly	<u>Yes</u>
	Groundwater depth and flow	Quarterly	<u>Yes</u>

1 Laboratory analytes include all analytes listed in Table 3.1

2 Field parameters are temperature, pH, redox, electrical conductivity, dissolved oxygen, turbidity, sheen and odour (visual check)

6.2 Review of monitoring program suitability

Spatial coverage provided by the current surface and groundwater monitoring network is considered adequate for the purpose of the project objectives.

A review of groundwater elevation contours and inferred flow directions is recommended as standard industry practice. This should incorporate the collection of survey levels by an appropriate contractor. No further changes to the monitoring program are suggested at the time of reporting herein.

6.3 Future monitoring

It is considered that ongoing compliance monitoring proposed for 2023 should remain consistent with the monitoring program completed during 2022, in accordance with Condition C19 (Table 1) outlined in the OSGMP.

6.4 Potential Work, Health & Safety (WHS) issues

Prior to commencing monitoring activities at Hexham TSF, all GHD site personnel completed an online induction and site familiarisation as directed by Aurizon. No safety incidents occurred during the 2022 compliance monitoring. As such, no WHS workshops were required.

7. References

Aurizon (2021a) *Hexham TSF Environmental Management*, 14-PLA-004-HEX Aurizon Hexham TSF OEMP, dated 1 October 2021.

Aurizon (2021b) *Hexham TSF Operational Surface and Groundwater Monitoring Plan*, 14-PLA-0004-HEX OSGMP, dated 30 March 2021.

Australian and New Zealand Environmental Conservation Council (ANZECC & ARMCANZ 2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

Douglas Partners (2014) Report on Discharge Criteria Assessment, Proposed Long Term Train Support Facility, Woodlands Close Hexham. Project 39798.17.18 February 2014.

GHD (2022a) Aurizon Hexham Compliance Water Monitoring, Quarterly Water Monitoring – Q1 2022. 2 May 2022.

GHD (2022b) Aurizon Hexham Compliance Water Monitoring, Quarterly Water Monitoring – Q2 2022. 15 July 2022.

GHD (2022c) Aurizon Hexham Compliance Water Monitoring, Quarterly Water Monitoring – Q3 2022. 30 September 2022.

GHD (2023a) Aurizon Hexham Compliance Water Monitoring, Quarterly Water Monitoring – Q4 2022. 6 February

NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Amended Measure (NEPM) No. 1 – Schedule B2, Guideline on Site Characterisation*.

Manly Hydraulics Laboratory (2022) Hexham Bridge (Station number 210448) Daily Rainfall data <http://www.mhl.nsw.gov.au/Site-210448>.

8. Limitations

This report: has been prepared by GHD for *Aurizon Operations Limited* and may only be used and relied on by *Aurizon Operations Limited* for the purpose agreed between GHD and *Aurizon Operations Limited* as set out in Section 1 of this report.

GHD otherwise disclaims responsibility to any person other than *Aurizon Operations Limited* arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

Specifically, this report does not take into account the effects, implications and consequences of or responses to COVID-19, which is a highly dynamic situation and rapidly changing. These effects, implications, consequences of and responses to COVID-19 may have a material effect on the opinions, conclusions, recommendations, assumptions, qualifications and limitations in this Report, and the entire Report must be re-examined and revisited in light of COVID-19. Where this Report is relied on or used without obtaining this further advice from GHD, to the maximum extent permitted by law, GHD disclaims all liability and responsibility to any person in connection with, arising from or in respect of this Report whether such liability arises in contract, tort (including negligence) or under statute.

GHD has prepared this report on the basis of information provided by *Aurizon Operations Limited* and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

Appendices

Appendix A

Annual results summary tables



**Appendix A
Table 2A
Basin Analytical Results**

	Field Parameters						NA Naphthalene (value used in F2 calc)	Inorganics					Nutrients				Organic Indicators BOD
	pH (Field)	Electrical conductivity (field)	Dissolved Oxygen (Field)	Redox (Field)	Temperature (Field)	Turbidity (Field)		pH (Lab)	Electrical conductivity (Lab)	Dissolved Oxygen (lab)	Turbidity (Lab)	Total Suspended Solids	Ammonia as N	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total		Phosphorus (Total)
	pH units	µS/cm	mg/L	mV	°C	NTU	mg/L	µS/cm	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR	0.1	1	0.1	1	0.1	1	0.01	0.1	10	0.01	1	5	0.01	0.01	0.1	0.01	5
Category B (Wetlands) Discharge Locations 4, 5 and 6	5.5-8.5	6,000				50		5.5-8.5	6,000		50	40		4	4	1.9	15

Location Code	Date /Time	Field ID	Category	pH (Field)	Electrical conductivity (field)	Dissolved Oxygen (Field)	Redox (Field)	Temperature (Field)	Turbidity (Field)	Naphthalene (value used in F2 calc)	pH (Lab)	Electrical conductivity (Lab)	Dissolved Oxygen (lab)	Turbidity (Lab)	Total Suspended Solids	Ammonia as N	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Phosphorus (Total)	BOD			
Basin 1	18/01/2022	Basin 1	B	7.5	743	0.3	-217.7	24.1	12	-	-	-	-	-	-	-	-	-	-	-	-	-		
	28/02/2022			7.3	867	0.5	-152.6	22.3	6.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9/03/2022			6.8	417.6	0.3	-128.5	22.1	-	-	7.9	430	-	2.1	38	<0.01	<0.05	1.9	1.9	0.67	<5			
	29/03/2022			7.1	495.3	1.3	-223.1	20.5	-	-	8	250	-	2.1	<5	0.23	<0.05	1.6	1.6	0.51	<5			
	7/04/2022			7.9	407.6	2.2	-221.1	18.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/05/2022			7.1	736	0.3	-201.1	16.2	25.63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	30/05/2022			7.2	840	0.1	-62.1	13.3	-	-	7.8	890	-	2.6	<5	0.08	0.06	0.36	0.3	0.48	<5			
	15/06/2022			7.2	876	1.0	-34	8.9	599.05	-	8	910	-	2.2	<5	0.07	<0.05	1.2	1.2	0.28	<5			
	6/07/2022			6.5	519	0.3	-122.2	14.8	1.89	-	7.3	180	-	3.6	12	0.05	<0.05	0.6	0.6	0.57	<5			
	18/07/2022			6.3	256.3	0.8	-13.2	10.6	13.89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	8/08/2022			6.9	500	0.5	-76.4	11.6	3.59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1/09/2022			7.1	806	0.5	-119.6	15.8	239.64	<0.01	7.8	790	-	<1	8	<0.01	<0.05	2.6	2.6	0.09	<5			
	11/10/2022			7.0	700	NM ^{#1}	-68.1	16.8	35.11	<0.01	7.8	720	9.3	3.3	6.6	<0.01	<0.05	0.6	0.6	0.2	<5			
	17/10/2022			6.8	735	1.1	-124.3	19.3	9.23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	3/11/2022			7.1	858	2.1	-43.4	17.2	13.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	7/12/2022			7.6	1198	0.4	-264.3	23.5	1299	<0.01	7.7	1,100	-	220	2,200	3	<0.05	34	34	1.9	240			
	Basin 2			18/01/2022	Basin 2	B	7.2	1937	0.4	-22.6	24	64	-	-	-	-	-	-	-	-	-	-	-	-
28/02/2022		6.8	1559	0.2			-137.1	21.4	35.4	-	-	-	-	-	-	-	-	-	-	-	-	-		
9/03/2022		6.7	754	2.6			-5.5	22.3	-	-	8.1	730	-	4	6.3	<0.01	<0.05	1.1	1.1	0.29	<5			
24/03/2022		7.1	1357	6.8			-164.9	20.1	12	-	7.7	1,300	-	2.1	8.9	0.29	0.21	2.11	1.9	1.5	<5			
29/03/2022		7.0	864	2.7			0.2	20.7	-	-	8	<10	-	3.6	10	0.14	<0.05	4.9	4.9	0.66	<5			
7/04/2022		7.9	1265	0.4			-176.4	18.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
4/05/2022		7.2	1540	0.6			33.6	16.5	43.22	-	-	-	-	-	-	-	-	-	-	-	-	-		
30/05/2022		6.9	1292	1.7			14.3	12.4	-	-	7.8	1,300	-	1.2	56	0.01	<0.05	<0.2	<0.2	0.33	<5			
15/06/2022		7.1	1694	3.2			139	8.3	0.8	-	7.8	1,800	-	31	240	<0.01	<0.05	1.3	1.3	0.27	10			
6/07/2022		6.4	397.6	2.3			194.5	15.4	5.89	-	6.9	320	-	4.7	5.3	0.02	0.13	<0.2	<0.2	0.51	<5			
18/07/2022		6.4	865	1.3			-102.3	10.5	63.87	-	-	-	-	-	-	-	-	-	-	-	-			
8/08/2022		7.1	1620	1.8			129.2	10.2	60.76	-	-	-	-	-	-	-	-	-	-	-	-			
1/09/2022		6.9	1760	1.1			17.4	13.2	46.46	<0.01	7.6	2,100	-	7.7	170	0.14	<0.05	12	12	0.27	10			
11/10/2022		6.8	781	NM ^{#1}			-77.2	15.2	25.12	<0.01	7.6	890	7.8	5	31	0.04	<0.05	2.9	2.9	0.3	8.8			
17/10/2022		6.4	1149	1.4			120.4	17.4	18.22	-	-	-	-	-	-	-	-	-	-	-	-			
3/11/2022		6.7	1835	0.0			-145	15.6	140.83	-	-	-	-	-	-	-	-	-	-	-	-			
Basin 3		18/01/2022	Basin 3	B			7.6	1942	0.3	-247.2	23.3	3200	-	-	-	-	-	-	-	-	-	-	-	
	28/02/2022	7.2			1615	0.7	-202.2	21.1	78.3	-	-	-	-	-	-	-	-	-	-	-				
	9/03/2022	6.6			1072	2.5	-88.8	21.7	-	-	7.6	1,100	-	7.7	20	<0.01	<0.05	1.7	1.7	0.98	<5			
	29/03/2022	6.3			1403	0.8	-148.4	19.4	-	-	7.5	<10	-	21	74	0.14	<0.05	<0.2	<0.2	1.7	5.3			
	4/05/2022	6.7			1787	0.3	-163.7	15.2	13.25	-	-	-	-	-	-	-	-	-	-	-				
	30/05/2022	6.3			2044	1.1	16.7	13.7	-	-	7	1,700	-	32	7.5	0.12	<0.05	0.5	0.5	0.23	<5			
	15/06/2022	6.3			2037	0.6	-82.1	8.6	3.5	-	7.1	1,900	-	48	40	0.03	<0.05	2.2	2.2	0.39	5.1			
	6/07/2022	5.8			1741	0.1	-111.2	13.9	5.61	-	6.9	100	-	7.5	5.8	<0.01	0.06	1.36	1.3	0.32	<5			
	18/07/2022	5.7			1005	4.9	69.1	10.8	6.23	-	-	-	-	-	-	-	-	-	-	-				
	8/08/2022	5.9			1649	0.3	-123.4	10.7	2.78	-	-	-	-	-	-	-	-	-	-	-				
	1/09/2022	6.5			1372	9.8	-9.4	16.1	318.6	<0.01	7.3	2,100	-	2.2	14	<0.01	<0.05	<0.2	<0.2	0.04	<5			
	11/10/2022	6.1			1516	NM ^{#1}	87.4	15.7	356.02	<0.01	7.1	890	8.8	2.8	65	<0.01	<0.05	4	4	0.22	<5			
	17/10/2022	5.7			1974	0.5	114.1	17.4	2.5	-	-	-	-	-	-	-	-	-	-	-				
	3/11/2022	6.3			2030	1.2	-77.4	15.4	9.2	-	-	-	-	-	-	-	-	-	-	-				
	8/12/2022	7.5			2302	0.0	-344.9	17.3	155.05	<0.01	7.9	2,300	-	6.7	14	1.8	<0.05	2.5	2.5	0.33	<5			

Comments
#1 - DO not measured as equipment reading for DO (field) was outside calibrated range (negative value)



**Appendix A
Table 2A
Basin Analytical Results**

		Metals																			
		Aluminium	Aluminium (filtered)	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (II+VI)	Chromium (II+VI) (filtered)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
		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		0.05	0.05	0.001	0.001	0.0002	0.0002	0.001	0.001	0.001	0.001	0.05	0.05	0.001	0.001	0.0001	0.0001	0.001	0.001	0.005	0.005
Category B (Wetlands) Discharge Locations 4, 5 and 6		2.5		0.013		0.0002		0.002		0.0026		1.3		0.0034		0.0006		0.011		0.019	

Location Code	Date /Time	Field ID	Category	Aluminium	Aluminium (filtered)	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (II+VI)	Chromium (II+VI) (filtered)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)		
Basin 1	18/01/2022	Basin 1	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	28/02/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9/03/2022			0.25	-	0.007	-	0.0003	-	0.003	-	0.009	-	1.4	-	0.004	-	<0.0001	-	0.005	-	0.019	-	-	-
	29/03/2022			<0.05	-	0.003	-	<0.0002	-	<0.001	-	0.001	-	0.19	-	<0.001	-	<0.0001	-	<0.001	-	0.006	-	-	-
	7/04/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/05/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	30/05/2022			<0.05	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	0.14	-	<0.001	-	<0.0001	-	<0.001	-	<0.005	-	-	-
	15/06/2022			<0.05	<0.05	0.001	0.001	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.001	0.06	<0.05	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	0.009	<0.005	-	-
	6/07/2022			0.15	-	<0.001	-	<0.0002	-	<0.001	-	0.001	-	0.23	-	<0.001	-	<0.0001	-	<0.001	-	0.005	-	-	-
	18/07/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8/08/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1/09/2022			<0.05	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	0.17	-	<0.001	-	<0.0001	-	<0.001	-	<0.005	-	-	-
	11/10/2022			<0.05	-	0.001	-	<0.0002	-	<0.001	-	<0.001	-	0.1	-	<0.001	-	<0.0001	-	<0.001	-	<0.005	-	-	-
	17/10/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/11/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
7/12/2022	8.8	-	0.022	-	<0.0002	-	0.011	-	0.035	-	14	-	0.021	-	<0.0001	-	0.036	-	0.18	-	-	-			
Basin 2	18/01/2022	Basin 2	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	28/02/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	9/03/2022			0.07	-	0.001	-	<0.0002	-	<0.001	-	0.001	-	0.63	-	<0.001	-	<0.0001	-	0.006	-	<0.005	-	-	
	24/03/2022			<0.05	-	0.001	-	<0.0002	-	<0.001	-	<0.001	-	0.13	-	<0.001	-	<0.0001	-	0.004	-	0.018	-	-	
	29/03/2022			0.07	-	<0.001	-	<0.0002	-	<0.001	-	0.001	-	0.76	-	<0.001	-	<0.0001	-	0.005	-	0.008	-	-	
	7/04/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	4/05/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	30/05/2022			<0.05	-	0.001	-	<0.0002	-	<0.001	-	<0.001	-	0.41	-	<0.001	-	<0.0001	-	0.005	-	<0.005	-	-	
	15/06/2022			0.23	<0.05	0.003	<0.001	<0.0002	<0.0002	<0.001	<0.001	0.004	<0.001	2.8	<0.05	<0.001	<0.001	<0.0001	<0.0001	0.012	0.005	0.016	0.006	-	-
	6/07/2022			0.09	-	0.001	-	<0.0002	-	<0.001	-	0.002	-	0.48	-	<0.001	-	<0.0001	-	0.004	-	<0.005	-	-	
	18/07/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	8/08/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1/09/2022			0.31	-	0.002	-	<0.0002	-	<0.001	-	0.003	-	3.4	-	<0.001	-	<0.0001	-	0.011	-	0.015	-	-	
	11/10/2022			0.05	-	0.001	-	<0.0002	-	<0.001	-	0.001	-	1.3	-	<0.001	-	<0.0001	-	0.006	-	0.006	-	-	
17/10/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
3/11/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Basin 3	18/01/2022	Basin 3	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	28/02/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	9/03/2022			0.09	-	<0.001	-	<0.0002	-	<0.001	-	<0.001	-	5.5	-	<0.001	-	<0.0001	-	0.011	-	0.01	-	-	
	29/03/2022			0.12	-	0.002	-	<0.0002	-	<0.001	-	0.003	-	5.8	-	<0.001	-	<0.0001	-	0.005	-	0.019	-	-	
	4/05/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	30/05/2022			<0.05	-	<0.001	-	<0.0002	-	<0.001	-	<0.001	-	4.6	-	<0.001	-	<0.0001	-	0.01	-	<0.005	-	-	
	15/06/2022			<0.05	<0.05	<0.001	<0.001	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.001	6.8	<0.05	<0.001	<0.001	<0.0001	<0.0001	0.009	0.007	0.013	<0.005	-	
	6/07/2022			0.13	-	<0.001	-	<0.0002	-	<0.001	-	0.002	-	0.35	-	<0.001	-	<0.0001	-	0.003	-	0.005	-	-	
	18/07/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	8/08/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1/09/2022			<0.05	-	<0.001	-	<0.0002	-	<0.001	-	<0.001	-	1.2	-	<0.001	-	<0.0001	-	0.016	-	0.007	-	-	
	11/10/2022			<0.05	-	<0.001	-	<0.0002	-	<0.001	-	<0.001	-	1.9	-	<0.001	-	<0.0001	-	0.011	-	0.01	-	-	
	17/10/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	3/11/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8/12/2022	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	<0.001	-	0.33	-	<0.001	-	<0.0001	-	0.004	-	<0.005	-	-				

Comments
#1 - DO not measured as equipment reading for DO (field) was outside calibrated range (negative value)



**Appendix A
Table 2A
Basin Analytical Results**

	BTEXN							TRH - NEPM 2013							TRH - NEPM 1999					PAHs - standard 16	
	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene
	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
LOR	1	1	1	1	2	3	1	1	20	20	50	50	100	100	100	20	50	100	100	100	1
Category B (Wetlands) Discharge Locations 4, 5 and 6	950	180	80			625		50													

Location Code	Date /Time	Field ID	Category	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene			
Basin 1	18/01/2022	Basin 1	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	28/02/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1	
	9/03/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1	
	29/03/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	7/04/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	4/05/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	30/05/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1
	15/06/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1
	6/07/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1
	18/07/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8/08/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1/09/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1
	11/10/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1
	17/10/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/11/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
7/12/2022	<1	<1	<1	<1	<2	<3	-	<1	60	60	50	50	300	<100	350	60	<50	200	100	300				<1			
Basin 2	18/01/2022	Basin 2	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	28/02/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1	
	9/03/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1	
	24/03/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1	
	29/03/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1	
	7/04/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/05/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	30/05/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1
	15/06/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1
	6/07/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1
	18/07/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8/08/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1/09/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1
	11/10/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	100	<100	100	<20	<50	<100	<100	<100	<100	<100	<100	<1
17/10/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
3/11/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Basin 3	18/01/2022	Basin 3	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	28/02/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1	
	9/03/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1	
	29/03/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	4/05/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	30/05/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1
	15/06/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	60	60	200	<100	260	<20	<50	200	<100	<100	<100	200	<1	
	6/07/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1
	18/07/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8/08/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1/09/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1
	11/10/2022			<1	<1	<1	<1	<2	<3	-	<1	<20	<20	360	360	500	<100	860	<20	630	400	<100	1,030			<1	
	17/10/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/11/2022			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8/12/2022	<1	<1	<1	<1	<2	<3	-	<1	<20	<20	<50	<50	<100	<100	<100	<100	<100	<20	<50	<100	<100	<100	<100	<1			

Comments
#1 - DO not measured as equipment reading for DO (field) was outside calibrated range (negative value)



**Appendix A
Table 2A
Basin Analytical Results**

	PAHs - standard 16															Microbes	
	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b+g)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEO)(zero LOR) - Lab Calc	Thermotolerant (Faecal) Coliforms
	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	cfu/100mL	
LOR	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	10
Category B (Wetlands) Discharge Locations 4, 5 and 6		0.6		0.1						1			0.6		1.5		500

Location Code	Date /Time	Field ID	Category	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b+g)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEO)(zero LOR) - Lab Calc	Thermotolerant (Faecal) Coliforms			
Basin 1	18/01/2022	Basin 1	B	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	28/02/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1700		
	9/03/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	52	
	29/03/2022		
	7/04/2022		
	4/05/2022		
	30/05/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	300	
	15/06/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	220	
	6/07/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1800	
	18/07/2022		
	8/08/2022		
	1/09/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	300	
	11/10/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	360	
	17/10/2022		
3/11/2022	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
7/12/2022	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	3800				
Basin 2	18/01/2022	Basin 2	B	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	28/02/2022			.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	9/03/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2300	
	24/03/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	7700	
	29/03/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	3300	
	7/04/2022		
	4/05/2022		
	30/05/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	200	
	15/06/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	160	
	6/07/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1000	
	18/07/2022		
	8/08/2022		
	1/09/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<100	
	11/10/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<100	
17/10/2022	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3/11/2022	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Basin 3	18/01/2022	Basin 3	B	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	28/02/2022			.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	9/03/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1100	
	29/03/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	4100	
	4/05/2022		
	30/05/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	170	
	15/06/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	520	
	6/07/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	500	
	18/07/2022		
	8/08/2022		
	1/09/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	200	
	11/10/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<100	
	17/10/2022		
	3/11/2022		
8/12/2022	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2700				

Comments
#1 - DO not measured as equipment reading for DO (field) was outside calibrated range (negative value)



**Appendix A
Table 2B
Surface Water Analytical Results**

	Field Parameters						NA Naphthalene (value used in F2 calc)	Inorganics					Nutrients					Organic Indicators BOD
	pH (Field)	Electrical conductivity (field)	Dissolved Oxygen (Field)	Redox (Field)	Temperature (Field)	Turbidity (Field)		pH (Lab)	Electrical conductivity (Lab)	Dissolved Oxygen (lab)	Turbidity (Lab)	Total Suspended Solids	Ammonia as N	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Phosphorus (Total)	
	pH units	µS/cm	mg/L	mV	°C	NTU	mg/L	µS/cm	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
LOR	0.1	1	0.1	1	0.1	1	0.01	10	0.01	1	5	0.01	0.01	0.1	0.1	0.01	5	
Category A (Hunter River) Discharge Locations 1, 2 and 3	6.5-8.5	40,000				60		40,000		60	50			10	8		40	
Category B (Wetlands) Discharge Locations 4, 5 and 6	5.5-8.5	6,000				50		6,000		50	40			4	4		15	

Location Code	Date	Field ID	Category	pH (Field)	Electrical conductivity (field)	Dissolved Oxygen (Field)	Redox (Field)	Temperature (Field)	Turbidity (Field)	Naphthalene (value used in F2 calc)	pH (Lab)	Electrical conductivity (Lab)	Dissolved Oxygen (lab)	Turbidity (Lab)	Total Suspended Solids	Ammonia as N	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Phosphorus (Total)	BOD
SW1	9/03/2022	SW1	A	6.7	5.8	1.8	41.1	22.7	-	-	7.8	420	-	33	30	0.04	0.24	2.44	2.2	1.5	<5
	29/03/2022		A	6.7	450.3	0.7	-18.9	22.5	-	-	7.8	450	-	3.9	<5	0.09	<0.05	2.3	2.3	0.91	<5
	30/05/2022		A	7.2	550.7	4.6	3.3	13.5	-	-	7.8	510	-	16	20	0.06	<0.05	2.2	2.2	0.23	<5
	6/07/2022		A	6.4	378.6	7.5	82.3	15.5	7.04	-	6.7	230	-	51	660	0.09	0.12	74.12	74	1.9	<20
	11/10/2022		A	6.9	755	NM#2	56.3	17.4	166.63	<0.01	7.8	880	9	24	13	0.15	<0.05	1.9	1.9	0.95	<5
SW2	9/03/2022	SW2	A	6.9	963	0.7	30.1	22.1	-	-	8	990	-	6.8	16	0.08	<0.05	1.9	1.9	1.5	<5
	29/03/2022		A	6.8	484.8	0.9	-6.2	22.8	-	-	7.8	440	-	6.6	15	0.07	<0.05	4.3	4.3	0.79	<5
	30/05/2022		A	7.1	526.2	3.2	4.1	12.8	-	-	7.5	530	-	15	17	0.03	<0.05	2.4	2.4	0.34	<5
	11/10/2022		A	7.4	693	9.8	30.8	19.3	61.51	<0.01	8	1,100	9.2	4.1	7.5	0.04	<0.05	1.1	1.1	0.45	5.1
SW3	9/03/2022	SW3	A	6.6	598	0.0	-107.4	21.1	-	-	7.3	510	-	22	68	<0.01	<0.05	7.6	7.6	4.6	10
	29/03/2022		A	7.4	1207	0.6	-131.4	22	-	-	7.7	1,600	-	5.5	5.9	0.27	<0.05	4	4	16	8.1
	30/05/2022		A	6.7	1065	0.4	-61.3	11.5	-	-	7.2	1,100	-	23	130	0.09	<0.05	3	3	3	<5
	11/10/2022		A	7.1	1000	NM#2	-123.7	17	175.39	<0.01	7.5	1,300	8.2	150	40	0.47	<0.05	6.4	6.4	6.5	7.1
SW4	9/03/2022	SW4	B	7.1	1653	0.1	-36.2	21.5	-	-	7.8	1,900	-	160	290	0.1	<0.05	9.4	9.4	8.7	22
	29/03/2022		B	7.0	1124	1.3	-96.9	20.8	-	-	8	2,000	-	250	150	0.47	<0.05	12	12	6.3	<5
	30/05/2022		B	6.8	2490	0.4	11.9	13.6	-	-	7.1	2,600	-	1,000	970	0.14	<0.05	16	16	3.8	9.1
	6/07/2022		B	6.4	609	4.5	96.3	15.3	9.41	-	7.2	570	-	68	77	0.16	0.34	2.54	2.2	3.8	<5
	11/10/2022		B	7.0	2235	NM#2	-179.8	15.7	412.38	<0.01	7.9	1,900	8.9	11	48	0.08	<0.05	0.8	0.8	1.5	<5
SW4A	9/03/2022	SW4A	B	7.1	1596	2.0	-56.8	21.4	-	-	7.8	1,800	-	550	530	0.33	<0.05	9.1	9.1	9.7	24
	29/03/2022		B	7.2	2176	2.3	-96.9	20.5	-	-	8.2	2,200	-	8.5	13	0.02	<0.05	1.8	1.8	2.5	15
	30/05/2022		B	6.8	2238	8.2	22.4	13	-	-	7.7	2,400	-	210	170	0.17	<0.05	6.8	6.8	4.2	5.7
	6/07/2022		B	6.6	530	4.6	157.8	15.4	37.37	-	7	580	-	370	230	0.14	0.37	2.47	2.1	5	<5
	11/10/2022		B	7.1	2230	NM#2	-164	15.8	523.84	<0.01	7.9	2,500	7.8	21	12	0.03	<0.05	1.8	1.8	5.1	<5
SW5	9/03/2022	SW5	B	6.5	1186	0.2	-35.2	22.3	-	-	7.5	1,200	-	300	240	0.2	<0.05	3.3	3.3	2	6.8
	29/03/2022		B	6.4	1414	0.8	-60.2	20.2	-	-	7.6	1,500	-	99	40	0.34	0.06	2.06	2	2.6	21
	30/05/2022		B	6.3	1846	0.4	10.8	15.3	-	-	6.5	1,900	-	26,000	4,200	0.9	<0.5	27	27	6	26
	6/07/2022		B	5.7	524	1.8	83.7	14.6	6240	-	7	570	-	1,100	390	0.3	0.06	3.56	3.5	2	15
	11/10/2022		B	6.2	1414	NM#2	-57.2	15.3	236.02	<0.01	6.9	1,400	7.9	15	170	0.26	<0.05	1.8	1.8	5.2	5.3
SW6	9/03/2022	SW6	B	6.7	721	0.7	-32.2	22.1	-	-	7.7	710	-	200	160	<0.01	<0.05	3.4	3.4	0.5	7.5
	29/03/2022		B	6.7	982	3.3	-44.4	20.6	-	-	7.8	990	-	15	<5	0.02	<0.05	0.7	0.7	0.25	<5
	30/05/2022		B	6.7	1927	2.1	8.1	12.5	-	-	7.4	2,100	-	180	77	0.09	<0.05	<0.2	<0.2	0.59	<5
	6/07/2022		B	5.9	373.9	4.5	126.4	15.1	36.5	-	6.8	370	-	5.7	<5	0.04	<0.05	<0.2	<0.2	0.06	<5
	11/10/2022		B	6.5	1295	NM#2	-58.6	16.1	8.99	<0.01	7.5	1,100	9	7	37	<0.01	<0.05	1.5	1.5	0.43	<5
SW7	9/03/2022	SW7	B	6.2	942	1.7	40.2	21.6	-	-	7.6	840	-	30	22	0.05	<0.05	1.9	1.9	0.33	<5
	29/03/2022		B	6.0	1587	0.5	-35.2	21.1	-	-	3.8	1,400	-	60	<5	0.04	0.09	0.39	0.3	0.58	<5
	30/05/2022		B	6.3	2115	2.9	19.7	14.3	-	-	6.9	2,200	-	680	200	0.57#1	<0.5	<0.5	<0.2#1	0.86	<5
	6/07/2022		B	5.9	437.6	5.1	74.5	15.2	6.14	-	6.9	450	-	6.6	5.6	0.03	<0.2	<0.2	<0.2	0.19	<5
	11/10/2022		B	5.4	1796	NM#2	38.7	16.5	3.9	<0.01	6.7	1,600	7.8	7.4	25	0.5	<0.05	1.7	1.7	0.12	<5
SW8	29/03/2022	SW8	A	7.3	859	6.4	-42	21.5	-	-	8.1	960	-	40	5.6	0.16	0.28	1.08	0.8	0.38	<5
SW9	29/03/2022	SW9	A	7.6	11.8	15.2	-37.6	22.3	-	-	8.2	2,600	-	12	7.6	0.36	0.19	1.29	1.1	0.52	<5
	30/05/2022		A	7.1	8093	3.9	33.8	18.3	-	-	7.9	29,000	-	8.9	5.5	0.37#1	0.14	<0.2	<0.2#1	0.42	<5
	1/09/2022		A	7.5	9376	8.3	28.9	16.7	1653.77	<0.01	8.2	7,800	-	1.8	7.4	0.19	0.37	2.87	2.5	0.1	<5
	7/12/2022		A	7.6	26254	6.8	68.8	22.2	12.68	<0.01	8	32,000	-	4.5	18	0.02	0.21	0.41	0.2	0.08	<5
SW11	9/03/2022	SW11	A	6.9	929	0.4	-11.6	21.4	-	-	7.9	1,100	-	17	80	0.07	<0.05	4	4	2.1	5.6
	29/03/2022		A	6.8	423.5	0.6	10	23	-	-	7.6	460	-	10	16	0.15	<0.05	1.1	1.1	0.75	<5
	30/05/2022		A	7.0	518.3	3.6	3.7	12.4	-	-	7.5	530	-	15	12	0.03	<0.05	0.5	0.5	0.17	<5
	11/10/2022		A	7.0	648	NM#2	55	18	42.94	<0.01	7.6	670	8.6	10	13	0.13	<0.05	3.1	3.1	1	<5

Comments

- #1 Theoretically the TKN result should be greater or equal to the ammonia concentration. However the difference reported is within the measurement uncertainty of the individual tests
- #2 - DO not measured as equipment reading for DO (field) was outside calibrated range (negative value)



**Appendix A
Table 2B
Surface Water Analytical Results**

	Metals																			
	Aluminium	Aluminium (filtered)	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
	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	0.05	0.05	0.001	0.001	0.0002	0.0002	0.001	0.001	0.001	0.001	0.05	0.05	0.001	0.001	0.0001	0.0001	0.001	0.001	0.005	0.005
Category A (Hunter River) Discharge Locations 1, 2 and 3	2.5		0.013		0.0002		0.004		0.0045		35		0.0044		0.0006		0.017		0.054	
Category B (Wetlands) Discharge Locations 4, 5 and 6	2.5		0.013		0.0002		0.002		0.0026		1.3		0.0034		0.0006		0.011		0.019	

Location Code	Date	Field ID	Category	Aluminium	Aluminium (filtered)	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
SW1	9/03/2022	SW1	A	0.61	-	0.006	-	<0.0002	-	0.002	-	0.011	-	2.4	-	0.006	-	<0.0001	-	0.006	-	0.039	-
	29/03/2022		A	0.87	-	0.001	-	<0.0002	-	<0.001	-	<0.001	-	2.8	-	<0.001	-	<0.0001	-	0.002	-	0.005	-
	30/05/2022		A	0.62	-	0.001	-	<0.0002	-	<0.001	-	<0.001	-	1.8	-	<0.001	-	<0.0001	-	0.003	-	0.006	-
	6/07/2022		A	4.1	-	0.012	-	<0.002	-	<0.01	-	0.025	-	19	-	0.021	-	<0.001	-	0.015	-	0.14	-
	11/10/2022		A	0.47	-	0.003	-	<0.0002	-	<0.001	-	0.004	-	2.1	-	0.004	-	<0.0001	-	0.005	-	0.012	-
SW2	9/03/2022	SW2	A	0.1	-	0.005	-	<0.0002	-	0.002	-	0.003	-	2.3	-	0.002	-	<0.0001	-	0.007	-	0.009	-
	29/03/2022		A	0.07	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	3.1	-	<0.001	-	<0.0001	-	0.002	-	<0.005	-
	30/05/2022		A	0.59	-	<0.001	-	<0.0002	-	0.002	-	0.002	-	1.7	-	<0.001	-	<0.0001	-	0.003	-	0.006	-
	11/10/2022		A	0.12	-	0.002	-	<0.0002	-	<0.001	-	0.001	-	1.8	-	<0.001	-	<0.0001	-	0.004	-	<0.005	-
SW3	9/03/2022	SW3	A	1.1	-	0.003	-	<0.0002	-	0.002	-	0.004	-	3.8	-	0.003	-	<0.0001	-	0.005	-	0.015	-
	29/03/2022		A	0.11	-	0.002	-	<0.0002	-	<0.001	-	0.003	-	1.7	-	<0.001	-	<0.0001	-	0.005	-	0.01	-
	30/05/2022		A	0.88	-	0.001	-	<0.0002	-	<0.001	-	0.001	-	1.9	-	<0.001	-	<0.0001	-	0.003	-	0.005	-
	11/10/2022		A	8.9	-	0.006	-	0.0003	-	0.011	-	0.013	-	12	-	0.012	-	<0.0001	-	0.017	-	0.052	-
SW4	9/03/2022	SW4	B	0.45	-	0.004	-	<0.0002	-	<0.001	-	0.004	-	16	-	0.002	-	<0.0001	-	0.005	-	0.024	-
	29/03/2022		B	0.41	-	0.013	-	<0.0002	-	<0.001	-	0.004	-	100	-	0.002	-	<0.0001	-	0.007	-	0.026	-
	30/05/2022		B	1.2	-	0.038	-	<0.001	-	<0.01	-	<0.01	-	290	-	<0.01	-	<0.001	-	0.012	-	0.051	-
	6/07/2022		B	0.25	-	0.002	-	<0.0002	-	<0.001	-	0.003	-	5.7	-	<0.001	-	<0.0001	-	0.002	-	0.014	-
	11/10/2022		B	0.07	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	5.9	-	<0.001	-	<0.0001	-	0.004	-	<0.005	-
SW4A	9/03/2022	SW4A	B	0.45	-	0.006	-	<0.0002	-	0.001	-	0.006	-	41	-	0.002	-	<0.0001	-	0.006	-	0.04	-
	29/03/2022		B	0.08	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	4.3	-	<0.001	-	<0.0001	-	0.006	-	0.009	-
	30/05/2022		B	1.7	-	0.039	-	<0.001	-	<0.01	-	<0.01	-	330	-	<0.01	-	<0.001	-	0.013	-	0.044	-
	6/07/2022		B	0.28	-	0.007	-	<0.0002	-	<0.001	-	0.003	-	36	-	0.001	-	<0.0001	-	0.002	-	0.017	-
	11/10/2022		B	0.37	-	0.003	-	<0.0002	-	<0.001	-	0.002	-	18	-	0.001	-	<0.0001	-	0.006	-	0.014	-
SW5	9/03/2022	SW5	B	0.25	-	0.011	-	<0.0002	-	<0.001	-	0.004	-	42	-	0.002	-	<0.0001	-	0.023	-	0.024	-
	29/03/2022		B	0.11	-	0.01	-	<0.0002	-	<0.001	-	<0.001	-	45	-	<0.001	-	<0.0001	-	0.029	-	0.011	-
	30/05/2022		B	3.8	-	0.19	-	<0.001	-	<0.01	-	0.049	-	970	-	0.012	-	<0.001	-	0.23	-	0.4	-
	6/07/2022		B	1.6	-	0.037	-	<0.002	-	<0.01	-	0.014	-	180	-	<0.01	-	<0.001	-	0.048	-	0.051	-
	11/10/2022		B	6	-	0.11	-	<0.002	-	<0.01	-	0.046	-	390	-	0.022	-	<0.001	-	0.31	-	0.81	-
SW6	9/03/2022	SW6	B	0.24	-	0.004	-	<0.0002	-	<0.001	-	0.002	-	65	-	<0.001	-	<0.0001	-	0.007	-	0.012	-
	29/03/2022		B	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	<0.001	-	4.4	-	<0.001	-	<0.0001	-	0.004	-	0.005	-
	30/05/2022		B	0.11	-	0.002	-	<0.0002	-	<0.001	-	0.002	-	30	-	<0.001	-	<0.0001	-	0.004	-	0.006	-
	6/07/2022		B	0.09	-	<0.001	-	<0.0002	-	<0.001	-	<0.001	-	0.51	-	<0.001	-	<0.0001	-	0.003	-	<0.005	-
	11/10/2022		B	0.1	-	0.004	-	<0.0002	-	<0.001	-	<0.001	-	41	-	<0.001	-	<0.0001	-	0.005	-	0.009	-
SW7	9/03/2022	SW7	B	0.11	-	0.002	-	<0.0002	-	0.002	-	0.002	-	5.3	-	<0.001	-	<0.0001	-	0.007	-	0.03	-
	29/03/2022		B	0.88	-	0.002	-	0.0004	-	<0.001	-	0.001	-	43	-	<0.001	-	<0.0001	-	0.063	-	0.27	-
	30/05/2022		B	0.77	-	0.012	-	<0.001	-	<0.01	-	<0.01	-	130	-	<0.01	-	<0.001	-	0.032	-	0.075	-
	6/07/2022		B	0.12	-	<0.001	-	<0.0002	-	<0.001	-	0.001	-	0.42	-	<0.001	-	<0.0001	-	0.001	-	0.013	-
	11/10/2022		B	0.19	-	0.003	-	<0.0002	-	<0.001	-	<0.001	-	32	-	<0.001	-	<0.0001	-	0.032	-	0.063	-
SW8	29/03/2022	SW8	A	2.2	-	0.002	-	<0.0002	-	0.003	-	0.004	-	4.1	-	0.002	-	<0.0001	-	0.007	-	0.032	-
	29/03/2022		A	0.43	-	0.002	-	<0.0002	-	<0.001	-	0.003	-	1.3	-	<0.001	-	<0.0001	-	0.002	-	0.005	-
SW9	30/05/2022	SW9	A	0.06	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	1.1	-	<0.001	-	<0.0001	-	<0.001	-	<0.005	-
	1/09/2022		A	0.1	-	0.001	-	<0.0002	-	<0.001	-	<0.001	-	0.72	-	<0.001	-	<0.0001	-	0.001	-	<0.005	-
	7/12/2022		A	0.2	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	0.34	-	<0.001	-	<0.0001	-	0.001	-	0.005	-
	9/03/2022		A	0.41	-	0.003	-	<0.0002	-	0.001	-	0.002	-	2.9	-	<0.001	-	<0.0001	-	0.008	-	0.013	-
SW11	29/03/2022	SW11	A	0.07	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	2.5	-	<0.001	-	<0.0001	-	0.002	-	0.007	-
	30/05/2022		A	0.73	-	<0.001	-	<0.0002	-	0.001	-	0.001	-	2	-	<0.001	-	<0.0001	-	0.003	-	0.007	-
	11/10/2022		A	0.37	-	0.002	-	<0.0002	-	0.001	-	0.002	-	2.3	-	<0.001	-	<0.0001	-	0.004	-	0.006	-

Comments
 #1 Theoretically the TKN result should be greater or equal to the ammonia concentration.
 However the difference reported is within the measurement uncertainty of the individual tests
 #2 - DO not measured as equipment reading for DO (field) was outside calibrated range (negative value)



**Appendix A
Table 2B
Surface Water Analytical Results**

	PAHs - standard 16															Microbes	
	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo[b]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Thermotolerant (Faecal) Coliforms
	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	cfu/100mL
LOR	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	10
Category A (Hunter River) Discharge Locations 1, 2 and 3		0.6		0.6						1					10		1,500
Category B (Wetlands) Discharge Locations 4, 5 and 6		0.6		0.1						1					1.5		500

Location Code	Date	Field ID	Category	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo[b]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Thermotolerant (Faecal) Coliforms
SW1	9/03/2022	SW1	A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2200
	29/03/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	430
	30/05/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	700
	6/07/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2500
	11/10/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	100
SW2	9/03/2022	SW2	A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1400
	29/03/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1900	
	30/05/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1000	
	11/10/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	400	
SW3	9/03/2022	SW3	A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1800
	29/03/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	7700	
	30/05/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	200	
	11/10/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1100	
SW4	9/03/2022	SW4	B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	12000
	29/03/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	17000	
	30/05/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2500	
	6/07/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1500	
	11/10/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	100	
SW4A	9/03/2022	SW4A	B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	14000
	29/03/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2500	
	30/05/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	500	
	6/07/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	9000	
	11/10/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1600	
SW5	9/03/2022	SW5	B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	700
	29/03/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	4100	
	30/05/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	600	
	6/07/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	400	
	11/10/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	200	
SW6	9/03/2022	SW6	B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2100
	29/03/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	880	
	30/05/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	300	
	6/07/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	140	
	11/10/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	200	
SW7	9/03/2022	SW7	B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1300
	29/03/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	810	
	30/05/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	300	
	6/07/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	240	
	11/10/2022		B	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	10	
SW8	29/03/2022	SW8	A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1300	
SW9	29/03/2022	SW9	A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	52
	30/05/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	20	
	1/09/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10
	7/12/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1
SW11	9/03/2022	SW11	A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1700
	29/03/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	110
	30/05/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	100
	11/10/2022		A	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	900

Comments

- #1 Theoretically the TKN result should be greater or equal to the ammonia concentration. However the difference reported is within the measurement uncertainty of the individual tests
- #2 - DO not measured as equipment reading for DO (field) was outside calibrated range (negative value)



**Appendix A
Table 2C
Groundwater Analytical Results**

	Field Parameters						NA	Inorganics				Nutrients						Organic Indicators	
	pH (Field)	Electrical conductivity (field)	Dissolved Oxygen (Field)	Redox (Field)	Temperature (Field)	Turbidity (Field)		Naphthalene (value used in F2 calc)	pH (Lab)	Electrical conductivity (Lab)	Turbidity (Lab)	Total Suspended Solids	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)		Kjeldahl Nitrogen Total	Phosphorus (Total)	BOD
	pH units	µS/cm	mg/L	mV	°C	NTU	mg/L	pH units	µS/cm	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR	0.1	1	0.1	1	0.1	1	0.01	0.1	10	1	5	0.01	0.01	0.01	0.01	0.1	0.1	0.01	5
Category C (Infiltrate)	5.5-8.5	20,500				1,200		5.5-8.5	20,500	1,200	650					12	12	14.5	30

Location Code	Date /Time	Field ID	Category	pH	EC (field)	DO (field)	Redox (field)	Temp (field)	Turb (field)	Naphthalene	pH (lab)	EC (lab)	Turb (lab)	TSS	Ammonia	Nitrate	Nitrite	Total Nitrogen	Total Nitrogen	Kjeldahl N	Phosphorus	BOD			
MW01R	24/03/2022	MW01R	C	6.0	6888	0.6	-10.1	19.3	-	-	6.4	9,000	360	220	0.7	-	-	0.15	1.85	1.7	0.15	17			
	15/06/2022			5.7	5128	0.3	-42.9	16.1	65.78	-	-	6.3	5,100	210	39	0.55	-	-	<0.05	1.3	1.3	0.07	20		
	1/09/2022			5.0	4253	NM#2	-63.5	15.2	49.52	<0.01	6	3,600	63	58	0.47	-	-	<0.05	2.1	2.1	<0.01	22			
	8/12/2022			6.2	6597	0.4	-70.5	17.6	124.1	<0.01	7.4	25,000	130	320	2.0#1	-	-	0.09	<0.2	<0.2	0.91	<5			
MW02	24/03/2022	MW02	C	5.3	2137	0.2	59.4	21.5	-	-	3.6	2,500	5.1	6.2	2.1#1	-	-	<0.05	1.5	1.5#1	0.55	5.1			
	15/06/2022			5.3	2162	0.2	74.5	20	10.02	-	6.3	2,100	7.7	11	2.1	-	-	<0.05	2.1	2.1	0.47	11			
	1/09/2022			5.0	1989	NM#2	77.1	18	6.53	<0.01	4	1,900	110	97	1.7	-	-	<0.05	3.9	3.9	0.01	8.2			
	8/12/2022			5.5	1764	0.0	-47.7	19.2	36.23	<0.01	6.8	1,800	63	40	1.7#1	-	-	<0.05	1.3	1.3	0.44	<5			
MW106R	24/03/2022	MW106R	C	6.8	962	0.3	-40.1	21.5	17.8	-	7.5	1,100	18	23	0.16	-	-	0.07	0.47	0.4	0.26	<5			
	15/06/2022			6.8	822	0.2	8.2	17.5	162.33	-	7.6	850	35	72	0.08	-	-	1.3	2.3	1	0.24	<5			
	1/09/2022			6.6	611	0.4	12	16.1	112.93	<0.01	7.8	500	28	36	<0.01	-	-	0.29	1.89	1.6	0.14	<5			
	7/12/2022			6.7	754	0.2	36.6	18.9	304.16	<0.01	7.7	790	140	130	0.1	-	-	<0.05	0.5	0.5	0.17	<5			
101R	24/03/2022	101R	C	6.6	11701	0.1	-73.2	21.3	-	-	6.9	9,400	550	370	3.1	-	-	<0.05	6.1	6.1	0.16	<5			
	15/06/2022			6.5	11380	0.7	-7.1	19.9	142.13	-	7.6	12,000	790	450	3.1	-	-	<0.05	10	10	0.27	<5			
	1/09/2022			6.5	11054	0.3	-16.8	19	134.48	<0.01	7.7	9,300	28	160	3.9	-	-	<0.05	7.5	7.5	0.03	<5			
	7/12/2022			7.2	7692	0.0	-60.1	19.9	219.18	<0.01	7.4	9,800	310	24	3.8	-	-	<0.05	9.5	9.5	0.23	<5			
MW301R	24/03/2022	MW301R	C	6.9	4912	0.1	-109.8	20	20.3	-	7.3	6,000	93	53	0.58	-	-	<0.05	1.2	1.2	2	<5			
	15/06/2022			6.7	5300	0.1	-61.3	16.2	38.34	-	7.7	4,000	41	50	0.89	-	-	<0.05	2.1	2.1	2.1	<5			
	1/09/2022			6.6	11275	0.1	-76.1	16.6	32.98	<0.01	7.6	8,900	61	76	2.9	-	-	<0.05	7.7	7.7	0.75	<5			
	7/12/2022			6.6	9631	0.1	-142.4	17.7	18.36	<0.01	8.1	15,000	150	64	3.7#1	-	-	<0.05	3.6	3.6#1	1.7	<5			
MW302R	24/03/2022	MW302R	C	6.5	304.1	4.9	5.7	20.8	35.5	-	7.3	370	23	45	0.22#1	-	-	0.07	<0.2	<0.2#1	0.4	<5			
				FD01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	0.47	0.4	0.4	-		
				FD02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.23	0.04	<0.01	0.04	1.3	1.3	0.31
	15/06/2022	MW302R		6.4	1870	0.2	-46.7	16.6	55.46	-	7.3	1,600	230	52	0.86	-	-	<0.05	1.4	1.4	0.55	<5			
				FD01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.45	2.25	1.8	0.57	-		
				FD02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	1.3	1.3	0.48	-		
	1/09/2022	MW302R		6.4	2160	3.0	13.7	15.7	175.3	<0.01	7.3	2,100	150	220	0.33	-	-	1.4	4.3	2.9	0.1	<5			
				FD01	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	1.3	3.9	2.6	0.08	-		
				FD02	-	-	-	-	-	<0.005	-	-	-	-	-	-	-	-	0.98	4.1	3.1	1.54	-		
	7/12/2022	MW302R		6.8	2127	0.0	-55.8	18.8	156.55	<0.01	6.8	2,400	420	200	1.4	-	-	<0.05	1.7	1.7	0.33	<5			
				FD01	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	<0.05	1.9	1.9	0.31	-		
				FD02	-	-	-	-	-	<0.005	-	-	-	-	-	-	-	-	<0.01	1.8	1.8	0.42	-		
MW307R	7/04/2022	MW307R	C	7.9	31690	0.3	-222.3	19.6	-	-	7.7	33,000	13	41	42#1	-	-	0.07	26.07	26#1	7.4	<5			
	15/06/2022			7.2	32001	0.2	-122.1	18.8	9.82	-	8.1	26,000	10	25	28	-	-	<0.05	24	24	8	<20			
	1/09/2022			7.1	26668	NM#2	-118.6	18	2.6	<0.01	8	26,000	1.5	36	26	-	-	<0.05	0.8	35.8	35	5.7	<5		
	8/12/2022			7.2	22034	0.0	-146.6	19.1	16.42	<0.01	8.2	33,000	14	50	32#1	-	-	<0.5	29	29	8.5	5.1			
MW308R	7/04/2022	MW308R	C	-	-	-	-	-	-	-	7	8,400	160	59	1.1	-	-	<0.05	1.6	1.6	0.34	<5			
	15/06/2022			6.3	5360	0.2	-52.3	13.6	62.96	-	7	6,600	220	20	1.5	-	-	<0.05	2.5	2.5	0.5	<5			
	1/09/2022			6.0	3319	NM#2	-49.9	14.7	78.53	<0.01	7.2	5,100	32	95	1.4	-	-	0.3	4.4	4.1	<0.01	<5			
	8/12/2022			6.5	4001	0.1	-89.1	18.5	110.11	<0.01	7.3	5,400	300	170	1.4	-	-	0.28	2.18	1.9	0.19	<5			
MW108R	7/04/2022	MW108R	C	-	-	-	-	-	-	-	7.3	3,400	43	31	0.33	-	-	<0.05	0.4	0.4	0.06	<5			
	15/06/2022			6.6	3130	3.1	43.4	18.8	17.54	-	6.8	3,100	15	7	0.24	-	-	<0.05	0.7	0.7	0.04	<5			
	1/09/2022			6.2	2973	2.4	67.5	17.6	16.72	<0.01	7.5	2,500	13	6	0.16	-	-	<0.05	2.3	2.3	0.03	<5			
	8/12/2022			6.5	3076	0.9	15.3	19.3	51.94	<0.01	7.8	3,100	59	82	0.08	-	-	<0.05	0.3	0.3	0.05	<5			
MW109	7/04/2022	MW109	C	7.1	1855	0.3	-199.1	21.5	-	-	7.9	3,100	54	95	0.02	-	-	<0.05	11	11	4.1	<5			
	1/09/2022			6.8	4574	0.2	-102.9	18	81.63	<0.01	7.7	4,000	57	130	0.53	-	-	<0.05	3	3	<0.01	<5			
	15/06/2022			6.9	3997	0.3	-98.5	19.2	36.78	-	8.1	4,700	510	390	0.62	-	-	<0.05	2.2	2.2	5.5	<5			
	7/12/2022			6.8	3913	0.1	-151.2	19.6	86.4	<0.01	7.9	4,500	310	720	0.52	-	-	<0.05	4	4	5.2	<5			
MW101R	7/04/2022	MW101R	C	7.0	20353	0.2	-164.5	20.2	740.2	-	7.1	19,000	220	54	1.6	-	-	0.13	2.83	2.7	0.84	<20			
	15/06/2022			6.4	24833	0.1	-173.6	17.4	18.36	-	7.4	20,000	180	73	1.9	-	-	<0.05	4.5	4.5	0.76	<5			
	1/09/2022			6.2	16981	0.4	-83.8	15.2	201.72	<0.01	7.5	11,000	61	390	1.1	-	-	<0.05	4.8	4.8	<0.01	<5			
	8/12/2022			6.3	15850	0.4	-65.7	19.1	794.54	<0.01	6.8	5,700	480	190	0.9	-	-	<0.25	1.1	1.1	0.05	<5			

Comments
 #1 Theoretically the TKN result should be greater or equal to the ammonia concentration. However the difference reported is within the measurement uncertainty of the individual tests
 #2 - DO not measured as equipment reading for DO (field) was outside calibrated range (negative value)



**Appendix A
Table 2C
Groundwater Analytical Results**

		Metals																				
		Aluminium	Aluminium (filtered)	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)	
		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		0.05	0.05	0.001	0.001	0.0002	0.0002	0.001	0.001	0.001	0.001	0.05	0.05	0.001	0.001	0.0001	0.0001	0.001	0.001	0.005	0.005	
Category C (Infiltrate)			0.055		0.013		0.0002		0.002		0.0071		350		0.0034		0.0006		0.18		0.65	

Location Code	Date /Time	Field ID	Category	Aluminium	Aluminium (filtered)	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)		
MW01R	24/03/2022	MW01R	C	-	<0.05	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	120	-	<0.001	-	<0.0001	-	0.019	-	<0.005		
	15/06/2022			-	0.07	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	<0.001	-	190	-	<0.001	-	<0.0001	-	0.075	-	0.012
	1/09/2022			-	0.16	-	0.001	-	<0.0002	-	<0.001	-	<0.001	-	<0.001	-	170	-	<0.001	-	<0.0001	-	0.044	-	<0.005
	8/12/2022			-	<0.05	-	0.003	-	<0.0002	-	<0.001	-	<0.001	-	<0.001	-	12	-	<0.001	-	<0.0001	-	0.012	-	0.012
MW02	24/03/2022	MW02	C	-	<0.05	-	0.015	-	<0.0002	-	<0.001	-	0.01	-	82	-	<0.001	-	<0.0001	-	0.066	-	0.1		
	15/06/2022			-	<0.05	-	0.014	-	<0.0002	-	<0.001	-	0.004	-	96	-	<0.001	-	<0.0001	-	0.073	-	0.092		
	1/09/2022			-	<0.05	-	0.013	-	<0.0002	-	<0.001	-	0.002	-	84	-	<0.001	-	<0.0001	-	0.066	-	0.11		
	8/12/2022			-	<0.05	-	0.014	-	<0.0002	-	<0.001	-	<0.001	-	82	-	<0.001	-	<0.0001	-	0.061	-	0.087		
MW106R	24/03/2022	MW106R	C	-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	0.002	-	1.1	-	<0.001	-	<0.0001	-	0.004	-	0.01		
	15/06/2022			-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	0.002	-	0.24	-	<0.001	-	<0.0001	-	0.003	-	0.013		
	1/09/2022			-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	0.003	-	<0.05	-	<0.001	-	<0.0001	-	0.003	-	0.014		
	7/12/2022			-	<0.5	-	<0.01	-	<0.002	-	<0.01	-	<0.01	-	<0.5	-	<0.01	-	<0.001	-	0.01	-	<0.05		
101R	24/03/2022	101R	C	-	<0.05	-	0.002	-	<0.0002	-	<0.001	-	0.002	-	37	-	<0.001	-	<0.0001	-	0.017	-	0.016		
	15/06/2022			-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	0.001	-	8.7	-	<0.001	-	<0.0001	-	0.006	-	<0.005		
	1/09/2022			-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	<0.001	-	7.2	-	<0.001	-	<0.0001	-	<0.001	-	<0.005		
	7/12/2022			-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	0.017	-	6.6	-	<0.001	-	<0.0001	-	0.005	-	<0.005		
MW301R	24/03/2022	MW301R	C	-	<0.05	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	6.7	-	<0.001	-	<0.0001	-	0.004	-	<0.005		
	15/06/2022			-	<0.05	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	6.8	-	<0.001	-	<0.0001	-	0.003	-	<0.005		
	1/09/2022			-	<0.05	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	4.9	-	<0.001	-	<0.0001	-	0.002	-	<0.005		
	7/12/2022			-	<0.05	-	0.001	-	<0.0002	-	<0.001	-	<0.001	-	7.3	-	<0.001	-	<0.0001	-	0.002	-	<0.005		
MW302R	24/03/2022	MW302R	C	-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	0.004	-	3.6	-	<0.001	-	<0.0001	-	0.004	-	0.024		
		FD01		-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	0.003	-	3.7	-	<0.001	-	<0.0001	-	0.004	-	0.021		
		FD02		-	0.06	-	0.002	-	<0.0001	-	<0.001	-	0.004	-	4.23	-	<0.001	-	<0.0001	-	0.004	-	0.028		
	15/06/2022	MW302R		-	<0.05	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	25	-	<0.001	-	<0.0001	-	0.004	-	0.021		
		FD01		-	<0.05	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	24	-	<0.001	-	<0.0001	-	0.004	-	-		
		FD02		-	<0.01	-	0.002	-	<0.0001	-	<0.001	-	<0.001	-	29.1	-	<0.001	-	<0.0001	-	0.005	-	0.029		
	1/09/2022	MW302R		-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	<0.001	-	0.001	-	16	-	<0.001	-	<0.0001	-	0.005	-	0.096
		FD01		-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	<0.001	-	0.001	-	15	-	<0.001	-	<0.0001	-	0.005	-	0.098
		FD02		-	<0.01	-	<0.001	-	0.0001	-	<0.001	-	0.001	-	15.7	-	<0.001	-	<0.0001	-	0.005	-	0.092		
	7/12/2022	MW302R		-	<0.05	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	<0.001	-	56	-	<0.001	-	<0.0001	-	0.01	-	0.067
		FD01		-	<0.05	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	<0.001	-	44	-	<0.001	-	<0.0001	-	0.008	-	0.053
		FD02		-	0.01	-	0.003	-	<0.0001	-	<0.001	-	<0.001	-	54.3	-	<0.001	-	<0.0001	-	0.01	-	0.069		
MW307R	7/04/2022	MW307R	C	-	-	-	<0.001	-	<0.0002	-	0.001	-	<0.001	-	0.12	-	<0.001	-	<0.0001	-	<0.001	-	<0.005		
	15/06/2022			-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	0.003	-	0.43	-	<0.001	-	<0.0001	-	<0.001	-	<0.005		
	1/09/2022			-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	0.003	-	0.15	-	<0.001	-	<0.0001	-	0.001	-	0.012		
	8/12/2022			-	<0.05	-	<0.001	-	<0.0002	-	0.001	-	<0.001	-	0.08	-	<0.001	-	<0.0001	-	<0.001	-	<0.005		
MW308R	7/04/2022	MW308R	C	-	-	-	0.003	-	<0.0002	-	<0.001	-	<0.001	-	51	-	<0.001	-	<0.0001	-	0.003	-	<0.005		
	15/06/2022			-	<0.05	-	0.009	-	<0.0002	-	<0.001	-	<0.001	-	46	-	<0.001	-	<0.0001	-	0.013	-	<0.005		
	1/09/2022			-	<0.05	-	0.008	-	0.0004	-	<0.001	-	<0.001	-	46	-	<0.001	-	<0.0001	-	0.014	-	<0.005		
	8/12/2022			-	<0.05	-	0.009	-	<0.0002	-	<0.001	-	<0.001	-	55	-	<0.001	-	<0.0001	-	0.017	-	<0.005		
MW108R	7/04/2022	MW108R	C	-	-	-	<0.001	-	<0.0002	-	<0.001	-	<0.001	-	0.91	-	<0.001	-	<0.0001	-	0.005	-	0.028		
	15/06/2022			-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	0.002	-	1.5	-	<0.001	-	<0.0001	-	0.005	-	0.045		
	1/09/2022			-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	0.001	-	1.2	-	<0.001	-	<0.0001	-	0.005	-	0.046		
	8/12/2022			-	<0.05	-	<0.001	-	<0.0002	-	<0.001	-	<0.001	-	0.68	-	<0.001	-	<0.0001	-	0.005	-	0.034		
MW109	7/04/2022	MW109	C	-	-	-	<0.001	-	<0.0002	-	0.001	-	<0.001	-	0.52	-	<0.001	-	<0.0001	-	<0.001	-	<0.005		
	1/09/2022			-	<0.05	-	0.003	-	<0.0002	-	0.001	-	<0.001	-	1.6	-	<0.001	-	<0.0001	-	0.001	-	0.031		
	15/06/2022			-	<0.05	-	0.002	-	<0.0002	-	0.001	-	<0.001	-	0.23	-	<0.001	-	<0.0001	-	<0.001	-	<0.005		
	7/12/2022			-	<0.5	-	<0.01	-	<0.002	-	<0.01	-	<0.01	-	<0.5	-	<0.01	-	<0.001	-	<0.01	-	<0.05		
MW101R	7/04/2022	MW101R	C	-	-	-	0.01	-	<0.0002	-	<0.001	-	<0.001	-	22	-	<0.001	-	<0.0001	-	0.028	-	0.16		
	15/06/2022			-	<0.05	-	0.005	-	<0.0002	-	<0.001	-	<0.001	-	11	-	<0.001	-	<0.0001	-	0.024	-	0.013		
	1/09/2022			-	<0.05	-	0.008	-	<0.0002	-	<0.001	-	<0.001	-	18	-	<0.001	-	<0.0001	-	<0.001	-	<0.005		
	8/12/2022			-	0.05	-	0.002	-	<0.0002	-	<0.001	-	<0.001	-	180	-	<0.001	-	<0.0001	-	0.066	-	0		



**Appendix A
Table 2C
Groundwater Analytical Results**

LOR	PAHs - standard 16															Microbes	
	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Thermotolerant (Faecal) Coliforms
	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	cfu/100mL
Category C (Infiltrate)	1	0.95	1	0.7	1	1	1	1	1	1.5	1	1	1	1	20	0.5	2,000

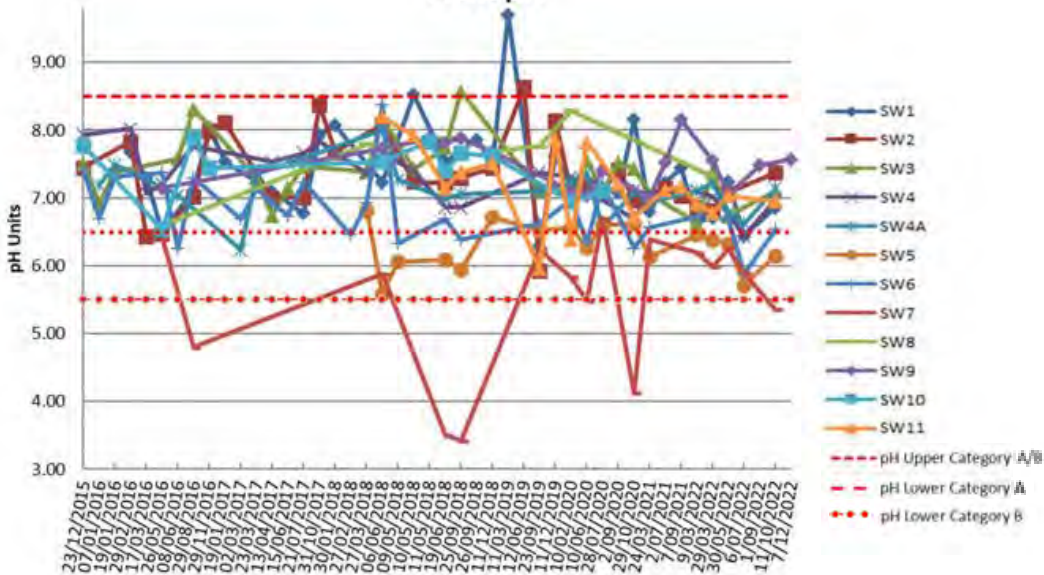
Location Code	Date /Time	Field ID	Category	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Thermotolerant (Faecal) Coliforms			
MW01R	24/03/2022	MW01R	C	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10			
	15/06/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10		
	1/09/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10	
	8/12/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10	
MW02	24/03/2022	MW02	C	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10		
	15/06/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10		
	1/09/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10	
	8/12/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10	
MW106R	24/03/2022	MW106R	C	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	220		
	15/06/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10		
	1/09/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<100	
	7/12/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	500	
101R	24/03/2022	101R	C	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10		
	15/06/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10		
	1/09/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10	
	7/12/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10	
MW301R	24/03/2022	MW301R	C	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	50		
	15/06/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10		
	1/09/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<100	
	7/12/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10	
MW302R	24/03/2022	MW302R	C	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	4900		
		FD01		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-		
		FD02		<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	-	-	
	15/06/2022	MW302R		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	97	
		FD01		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	
		FD02		<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<0.5	-	-
	1/09/2022	MW302R		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	100	
		FD01		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	
		FD02		<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<0.5	-	-
	7/12/2022	MW302R		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	200	
		FD01		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	
		FD02		<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	-	-
MW307R	7/04/2022	MW307R	C	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	370		
	15/06/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10		
	1/09/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<100	
	8/12/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10	
MW308R	7/04/2022	MW308R	C	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	30	
	15/06/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10	
	1/09/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<100	
	8/12/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10	
MW108R	7/04/2022	MW108R	C	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	900	
	15/06/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	1400	
	1/09/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<100	
	8/12/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	10	
MW109	7/04/2022	MW109	C	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	3100	
	1/09/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	400	
	15/06/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	540	
	7/12/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	150	
MW101R	7/04/2022	MW101R	C	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	20	
	15/06/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10	
	1/09/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	260	
	8/12/2022			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<10	

Comments
 #1 Theoretically the TKN result should be greater or equal to the ammonia concentration. However the difference reported is within the measurement uncertainty of the individual tests
 #2 - DO not measured as equipment reading for DO (field) was outside calibrated range (negative value)

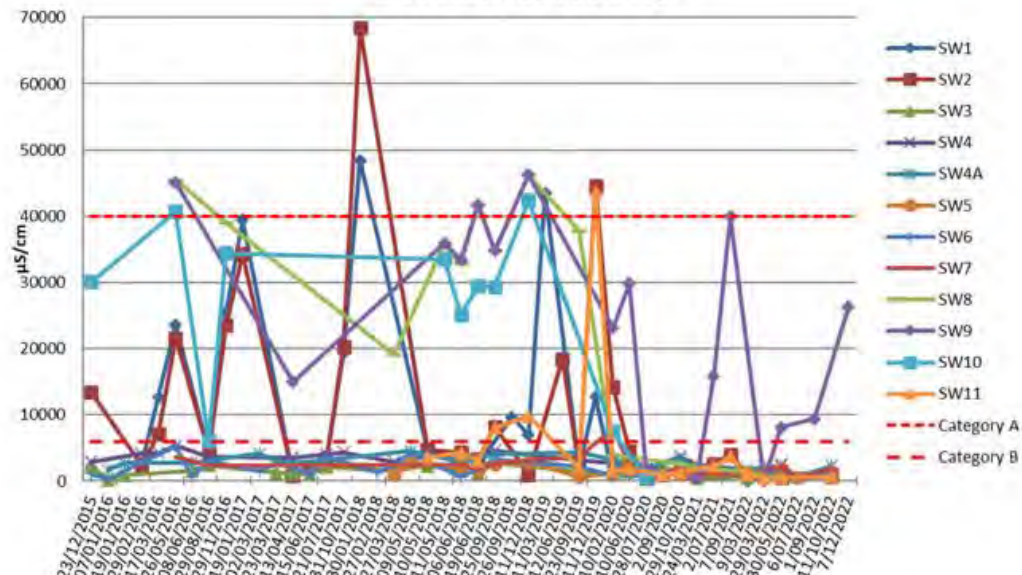
Appendix B

Historical trend analysis graphs

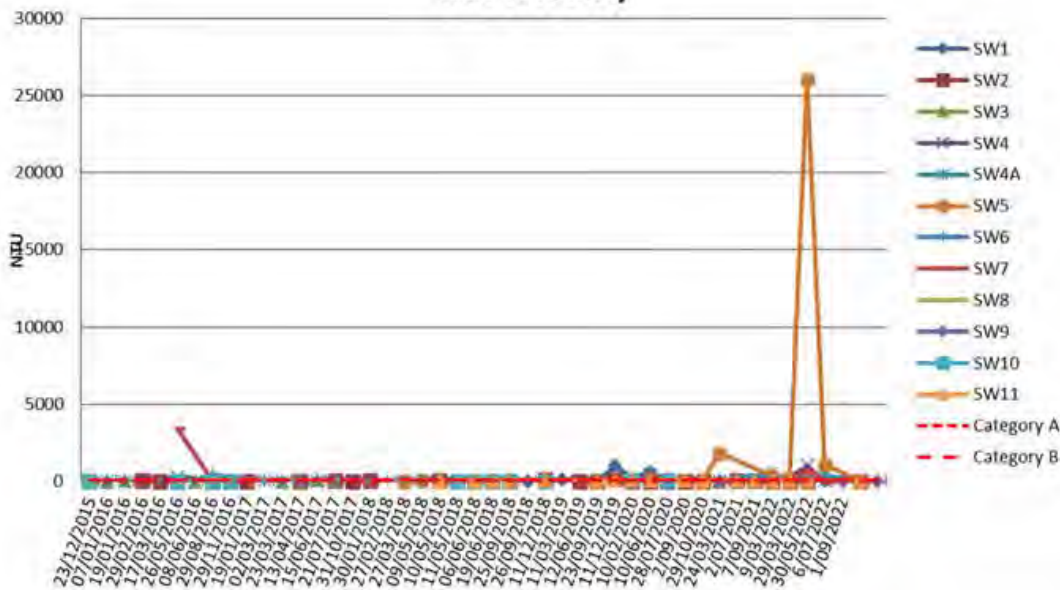
Field pH



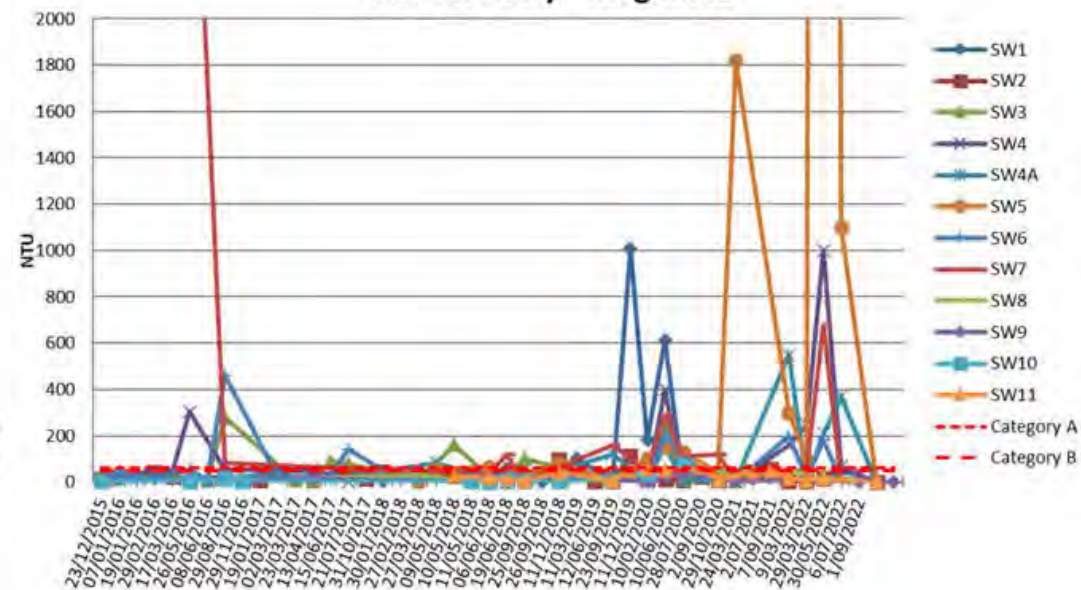
Electrical conductivity



Lab Turbidity



Lab Turbidity - Magnified



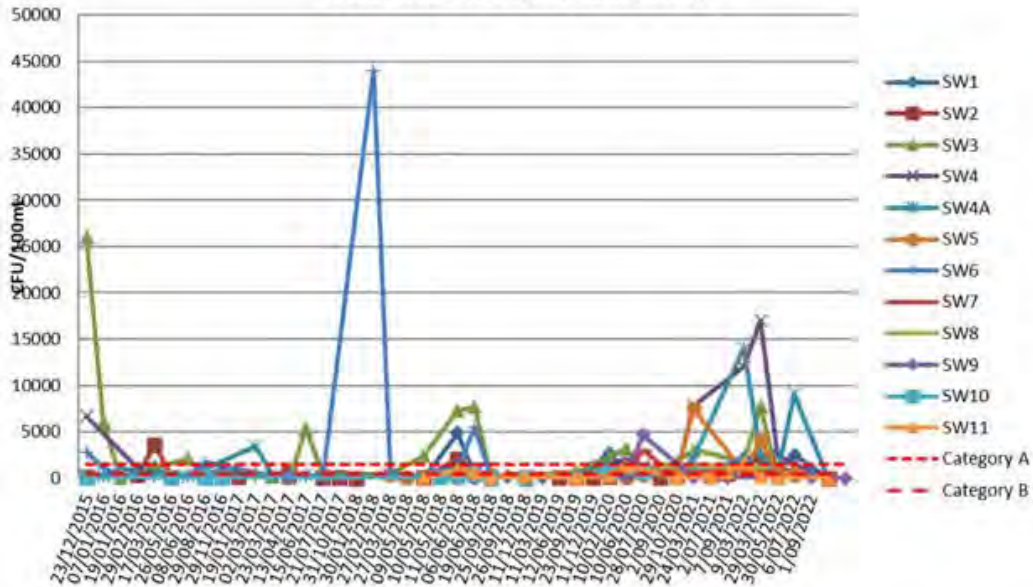
Aurizon Hexham
Long-Term Train Support Facility

Compliance Monitoring 2022
Surface Water Historical Trends

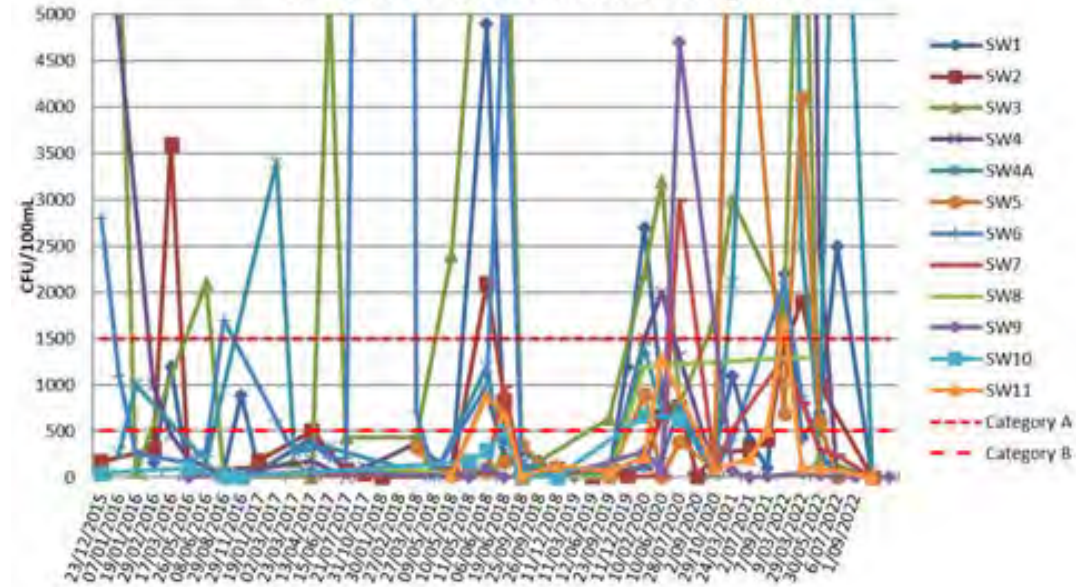
Job Number | 12584780
Revision | 0
Date | 6 February 2023

Appendix E

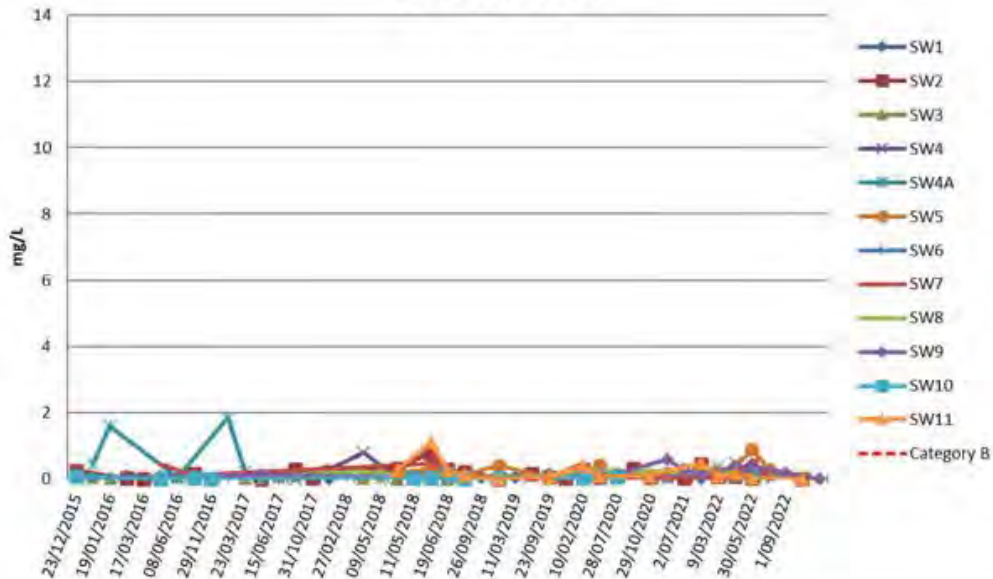
Thermotolerant Coliforms



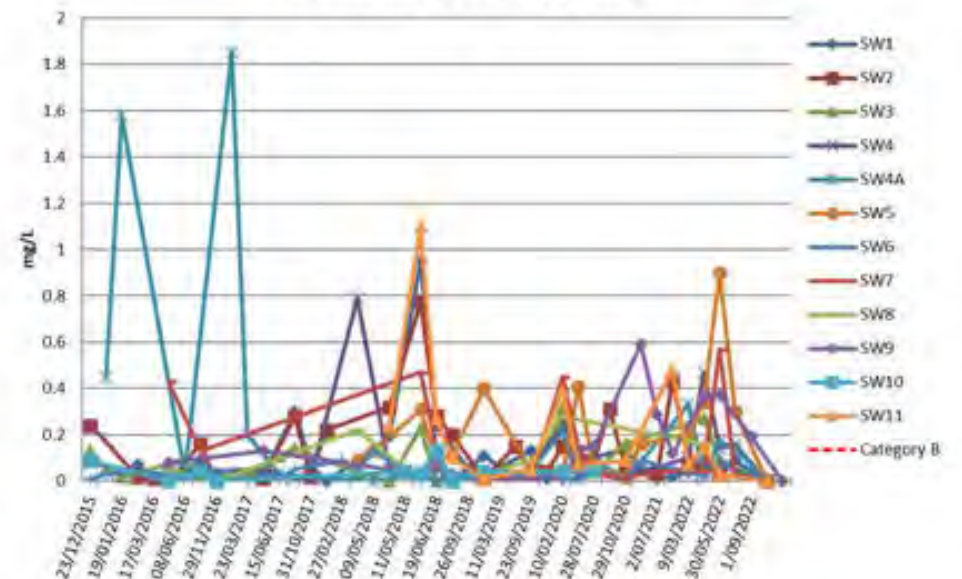
Thermotolerant Coliforms - Magnified



Ammonia as N



Ammonia as N - Magnified



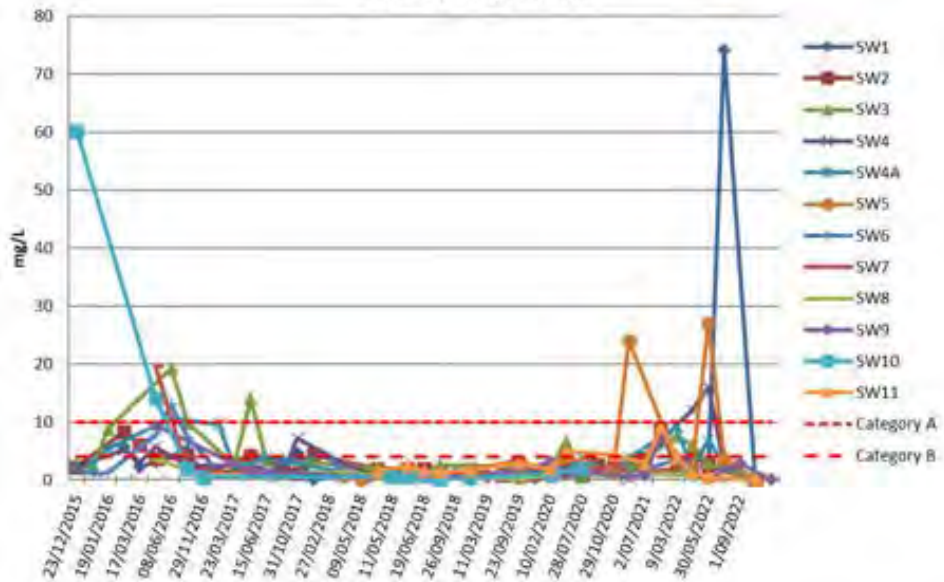
Aurizon Hexham
Long-Term Train Support Facility

Compliance Monitoring 2022
Surface Water Historical Trends

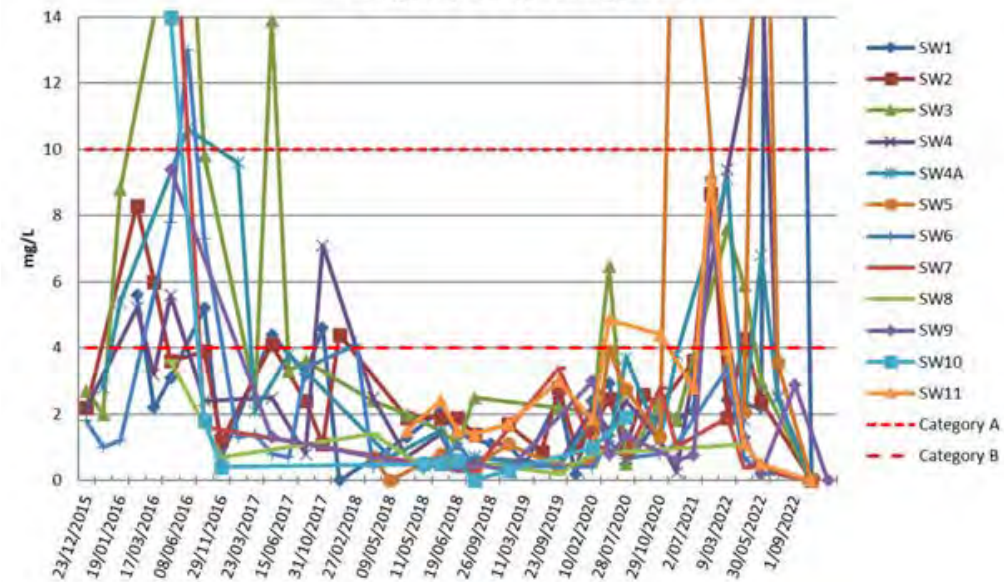
Job Number | 12584780
Revision | 0
Date | 6 February 2023

Appendix E

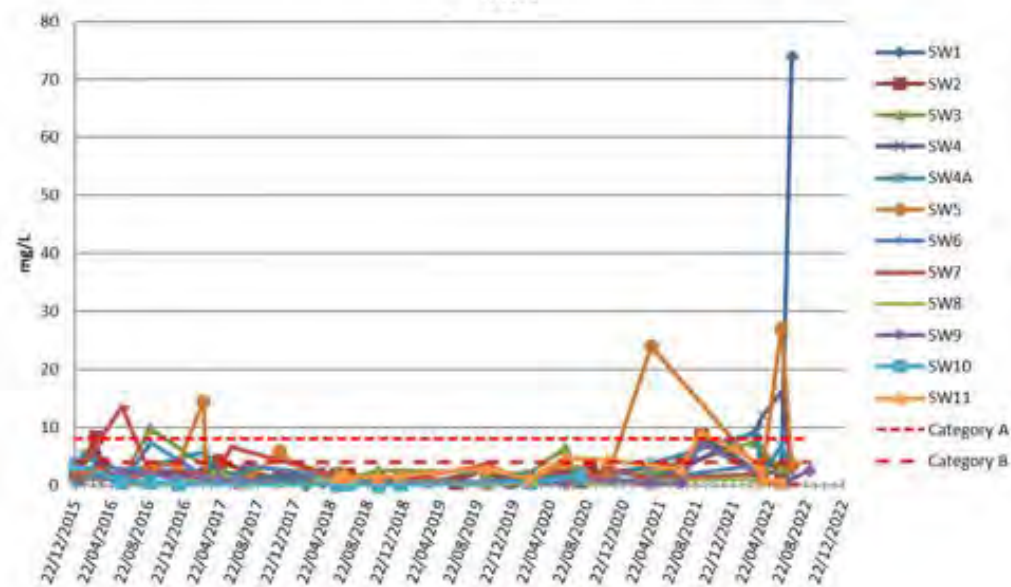
Nitrogen (Total)



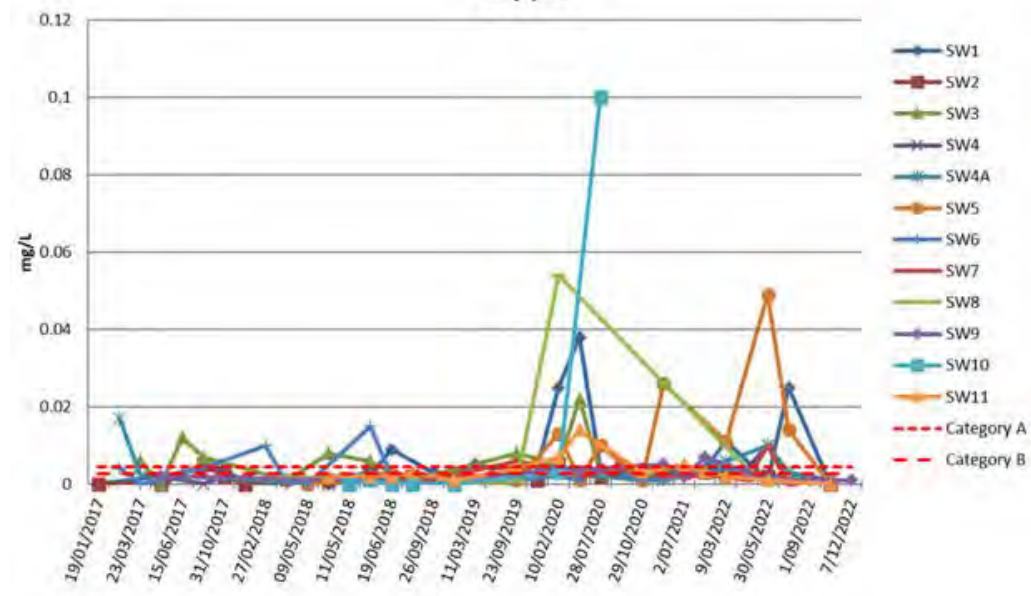
Nitrogen (Total) - Magnified



TKN



Copper



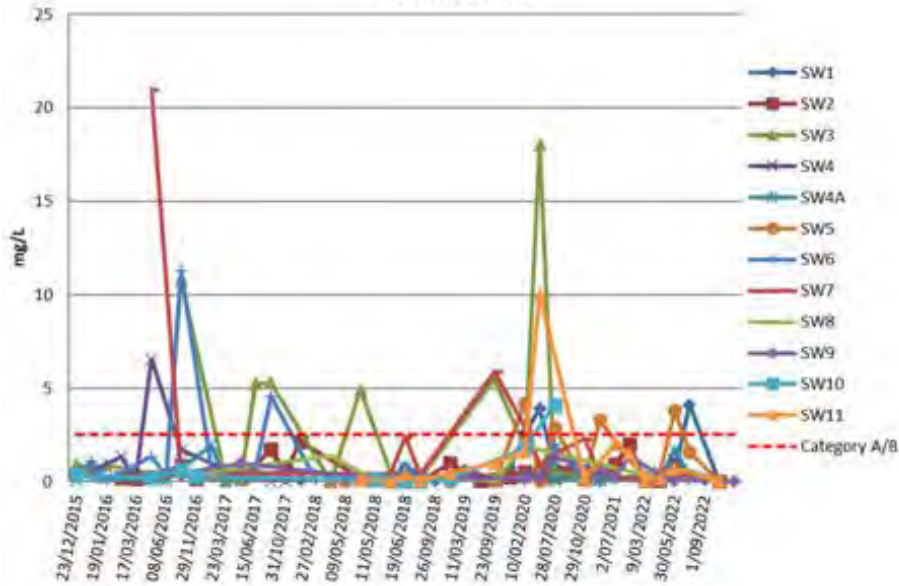
Aurizon Hexham
Long-Term Train Support Facility

Compliance Monitoring 2022
Surface Water Historical Trends

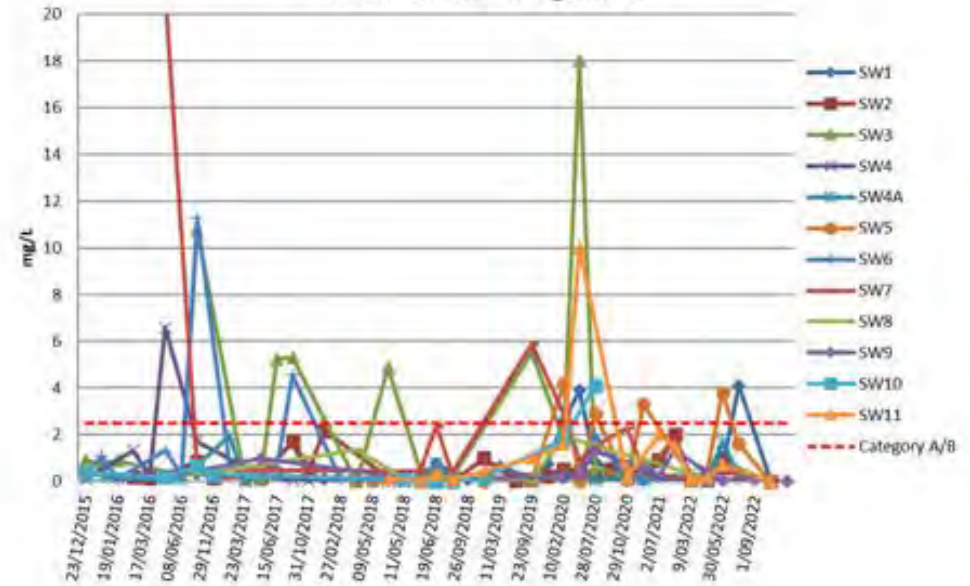
Job Number | 12584780
Revision | 0
Date | 6 February 2023

Appendix E

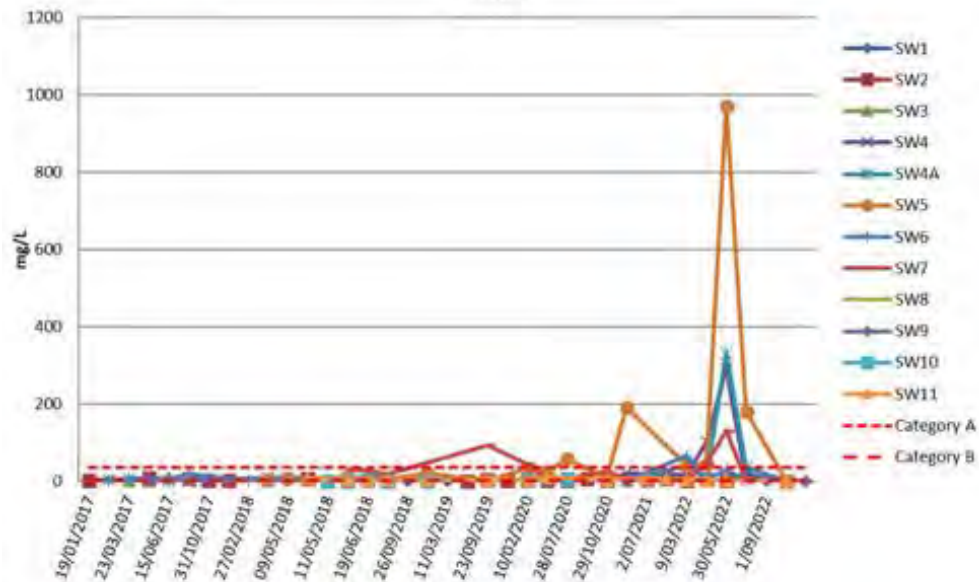
Aluminium



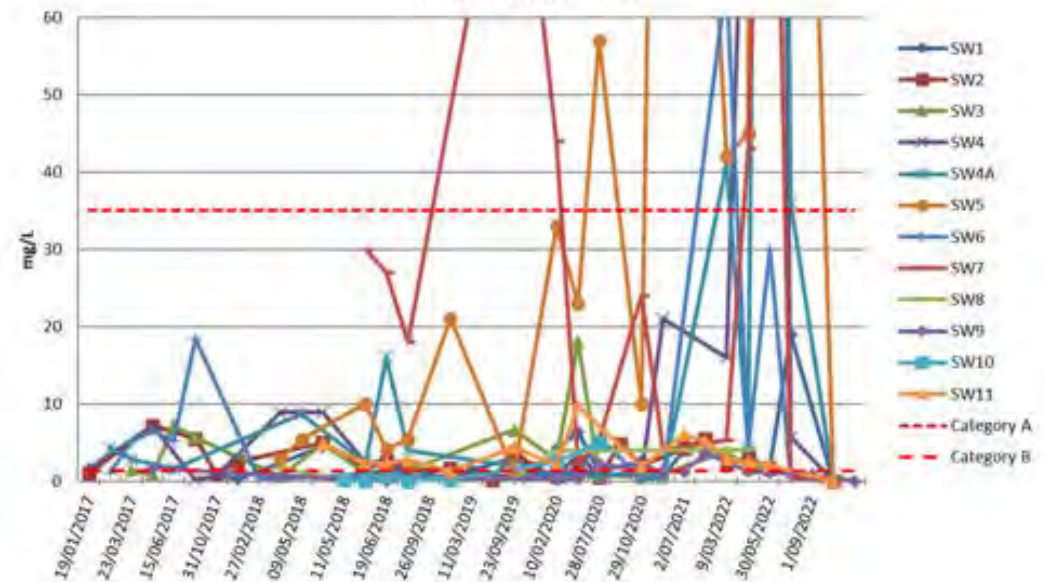
Aluminium - Magnified



Iron



Iron - Magnified



Aurizon Hexham
Long-Term Train Support Facility

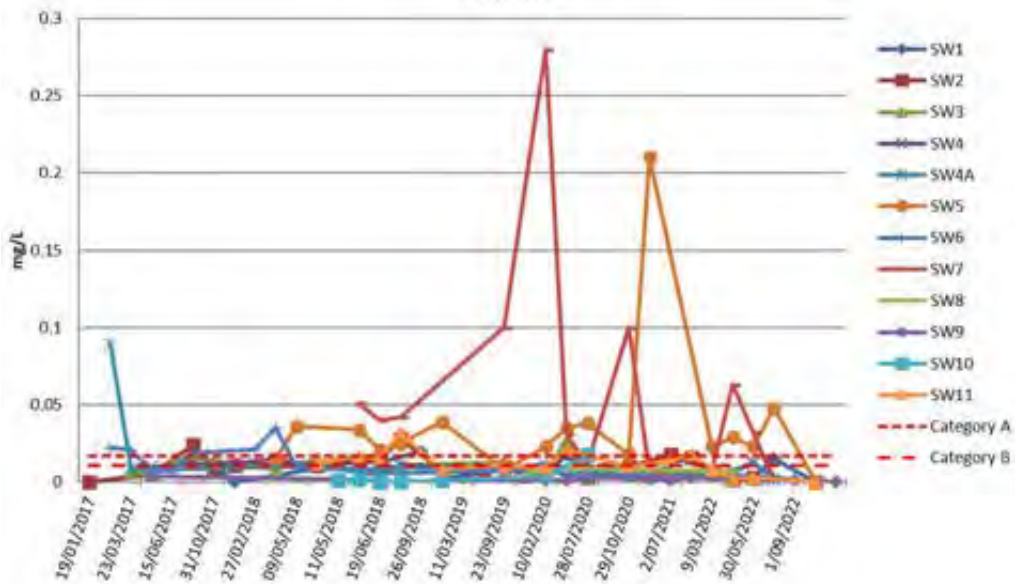
Job Number | 12584780
Revision | 0
Date | 6 February 2023



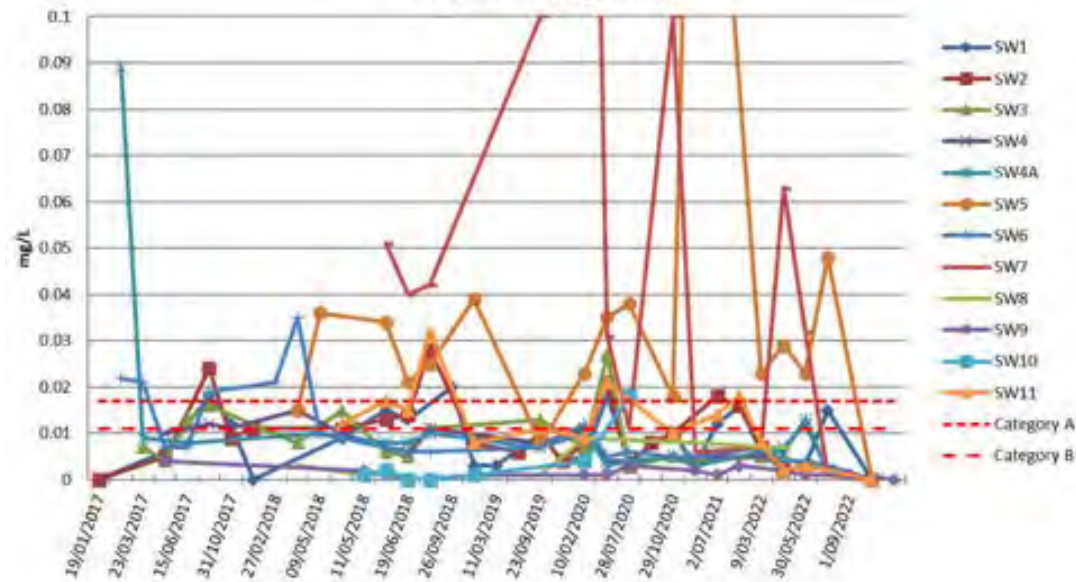
Compliance Monitoring 2022
Surface Water Historical Trends

Appendix E

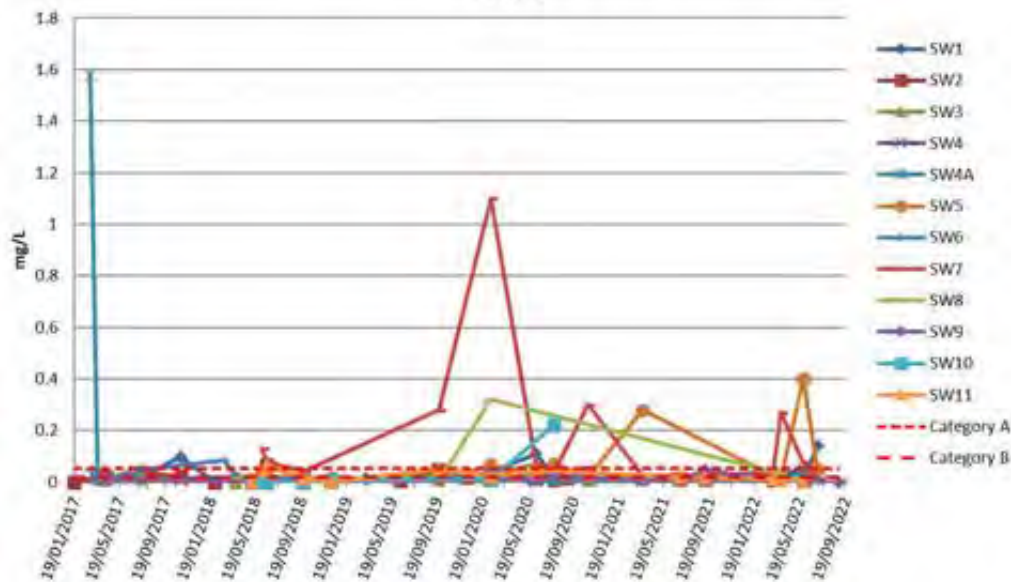
Nickel



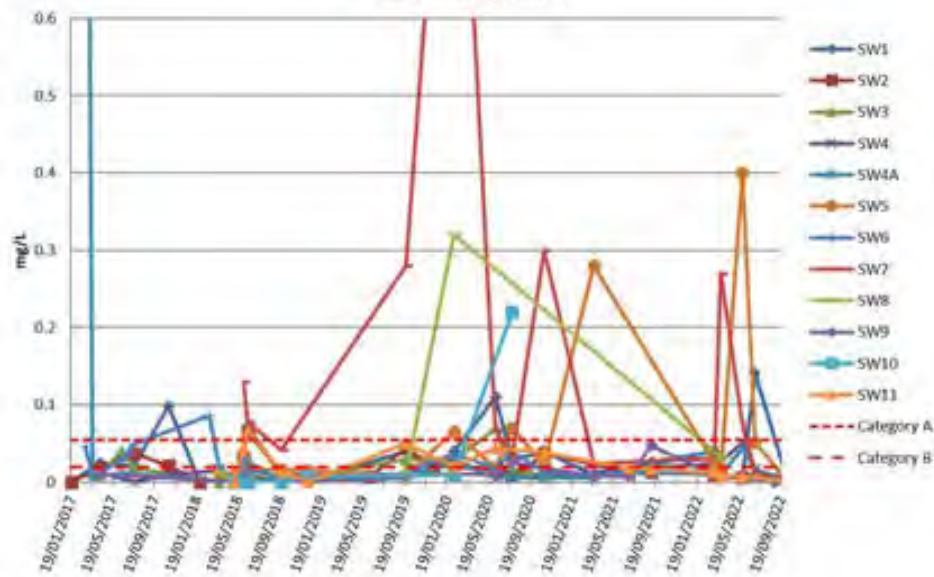
Nickel - Magnified



Zinc



Zinc - Magnified



Aurizon Hexham
Long-Term Train Support Facility

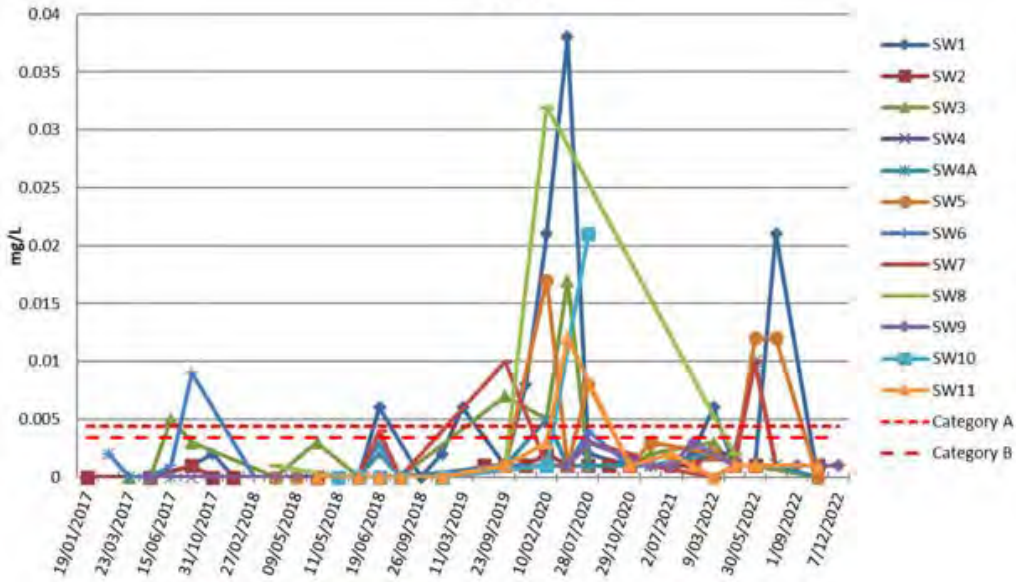
Job Number | 12584780
Revision | 0
Date | 6 February 2023



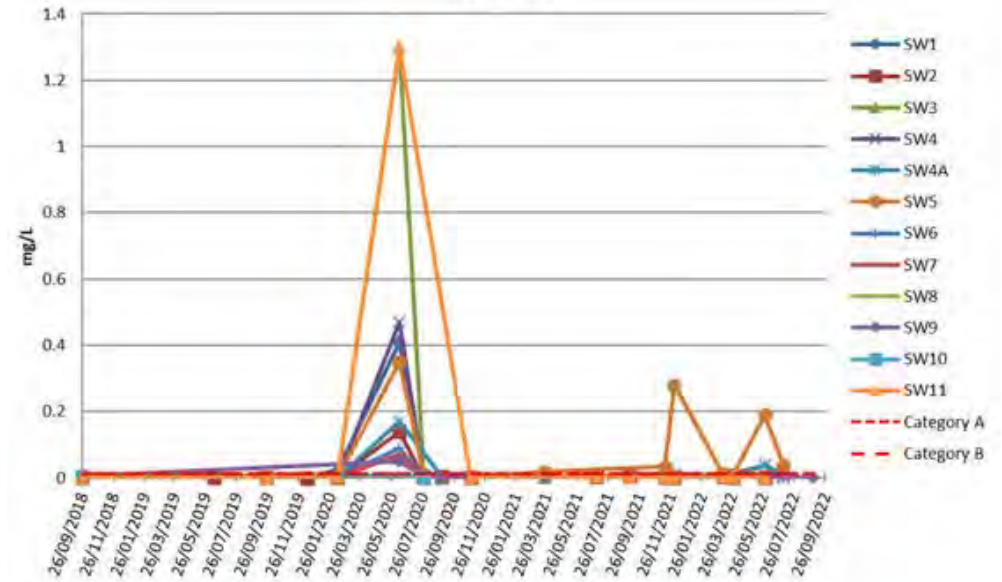
Compliance Monitoring 2022
Surface Water Historical Trends

Appendix E

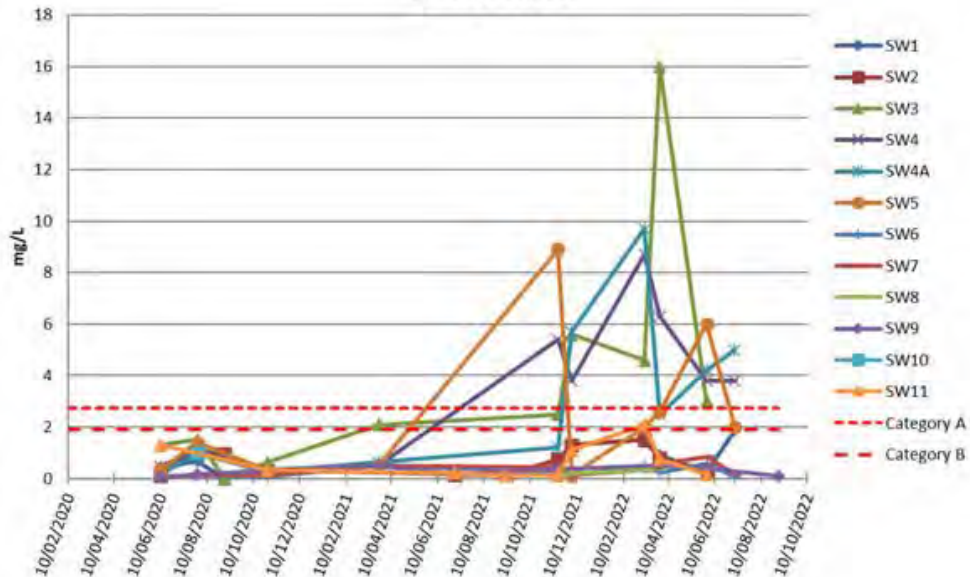
Lead



Arsenic



Phosphorus



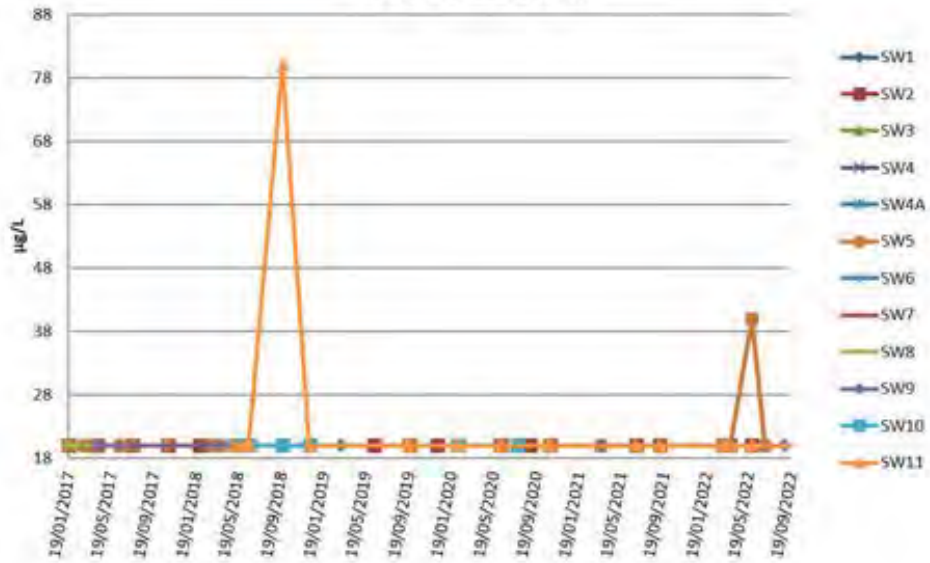
Aurizon Hexham
Long-Term Train Support Facility

Compliance Monitoring 2022
Surface Water Historical Trends

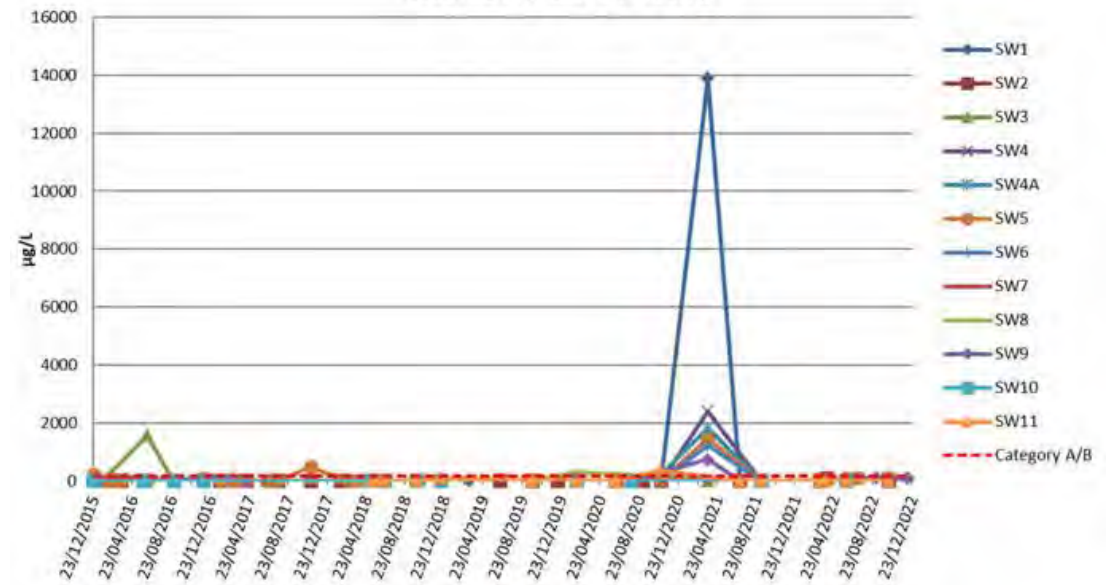
Job Number | 12584780
Revision | 0
Date | 6 February 2023

Appendix E

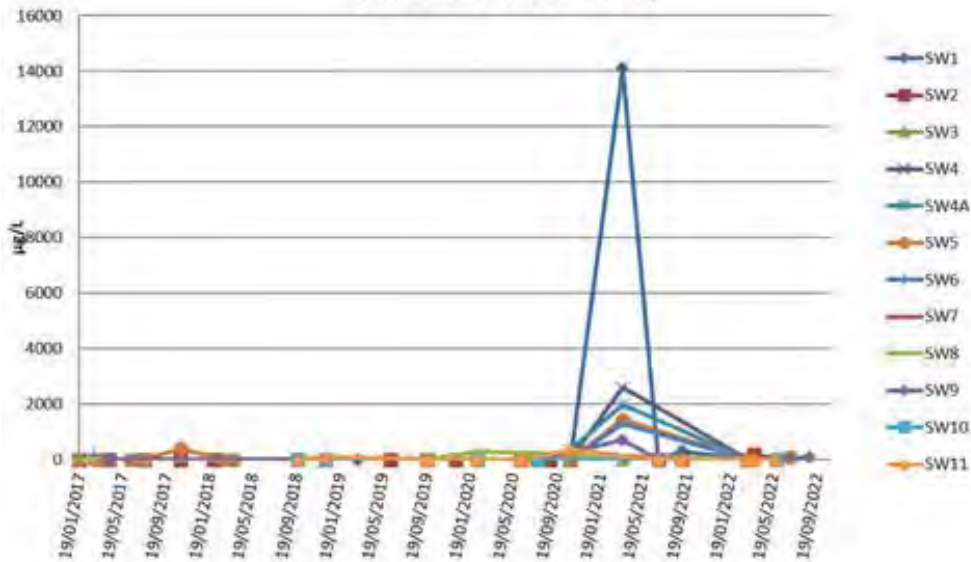
C6-C10 Fraction



C10-C36 (Sum of Total)



C10-C40 (Sum of Total)



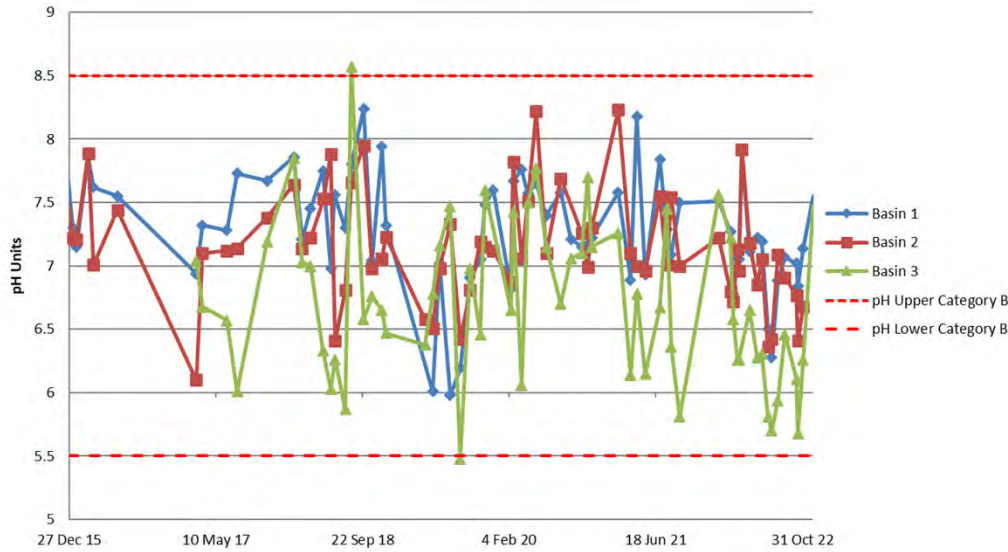
Aurizon Hexham
Long-Term Train Support Facility

Compliance Monitoring 2022
Surface Water Historical Trends

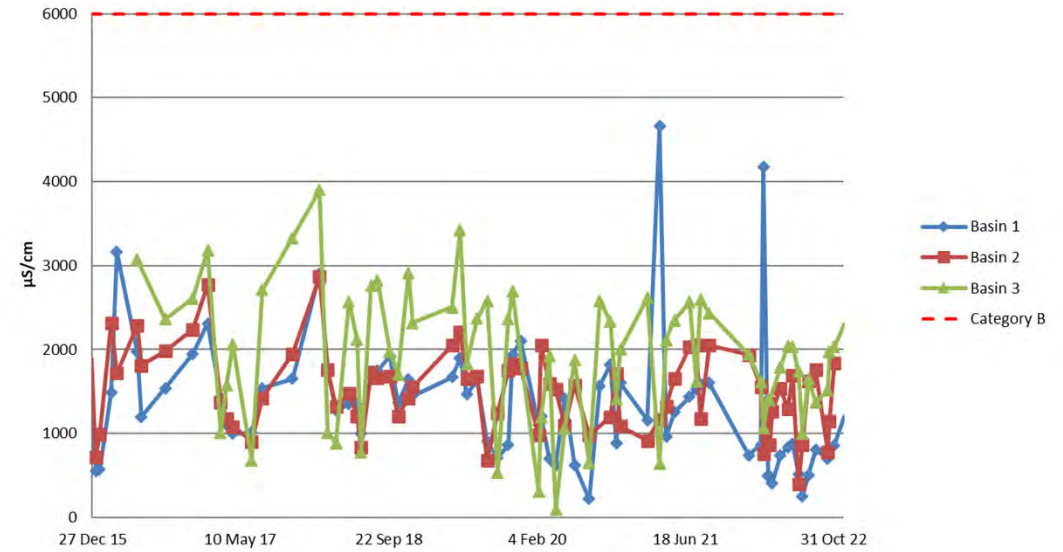
Job Number | 12584780
Revision | 0
Date | 6 February 2023

Appendix E

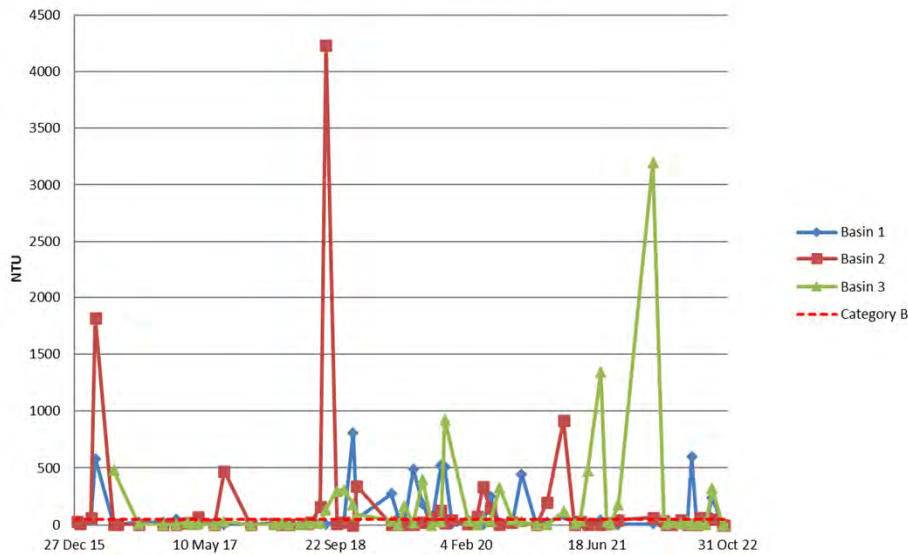
Field pH



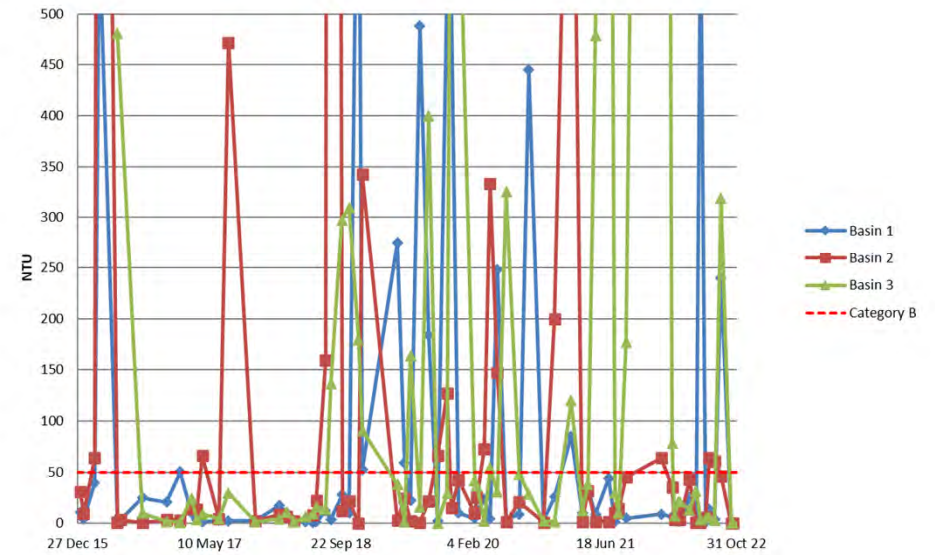
Field Electrical Conductivity



Lab Turbidity



Lab Turbidity - Magnified

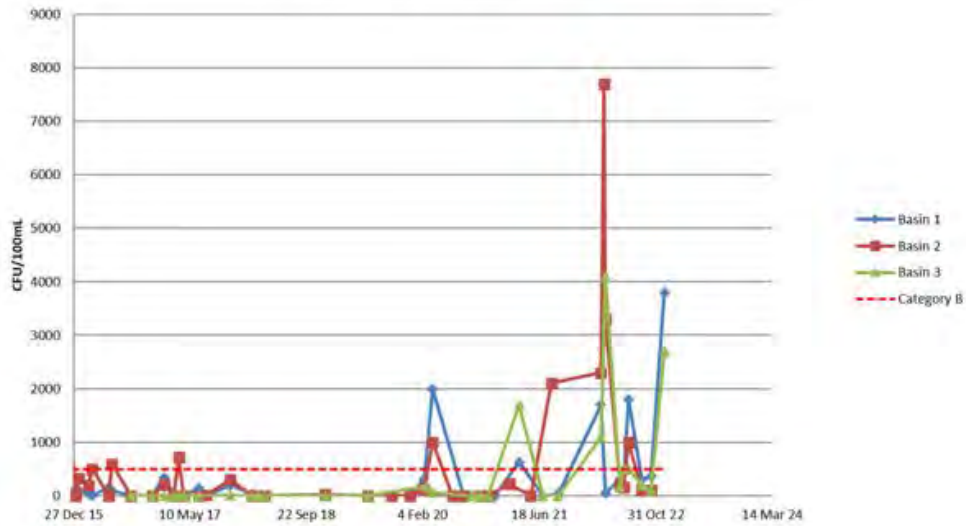


Aurizon Hexham
 Long-Term Train Support Facility
 Compliance Monitoring 2022
 Basin 1 – Basin 3 Historical Trends

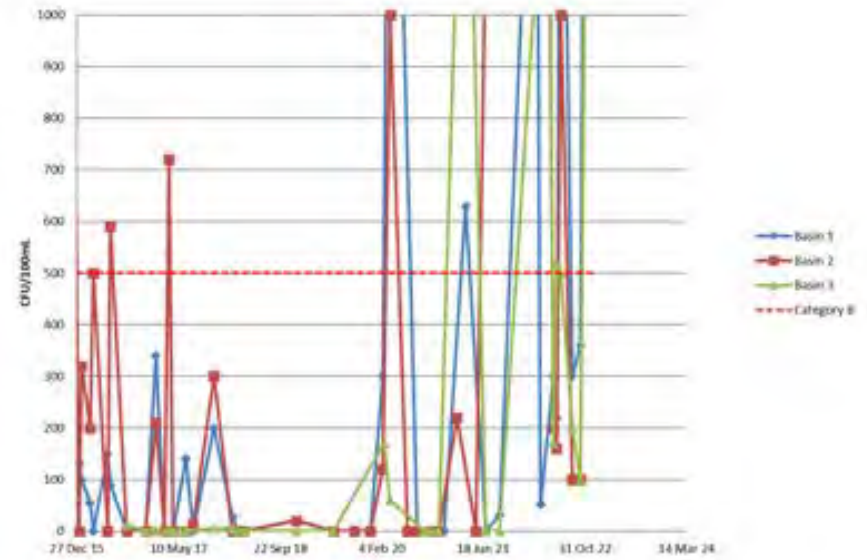
Job Number | 12584780
 Revision | 0
 Date | 6 February 2023

Appendix E

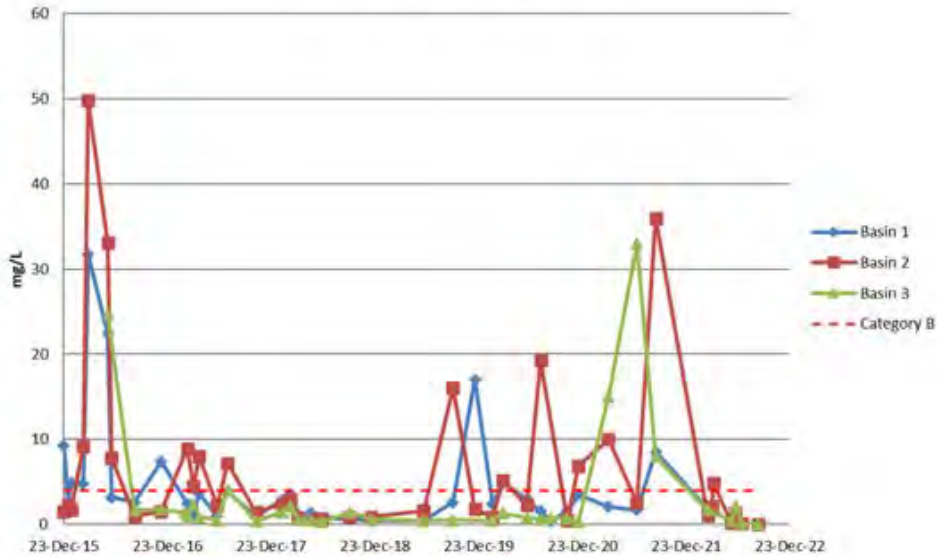
Thermotolerant Coliforms



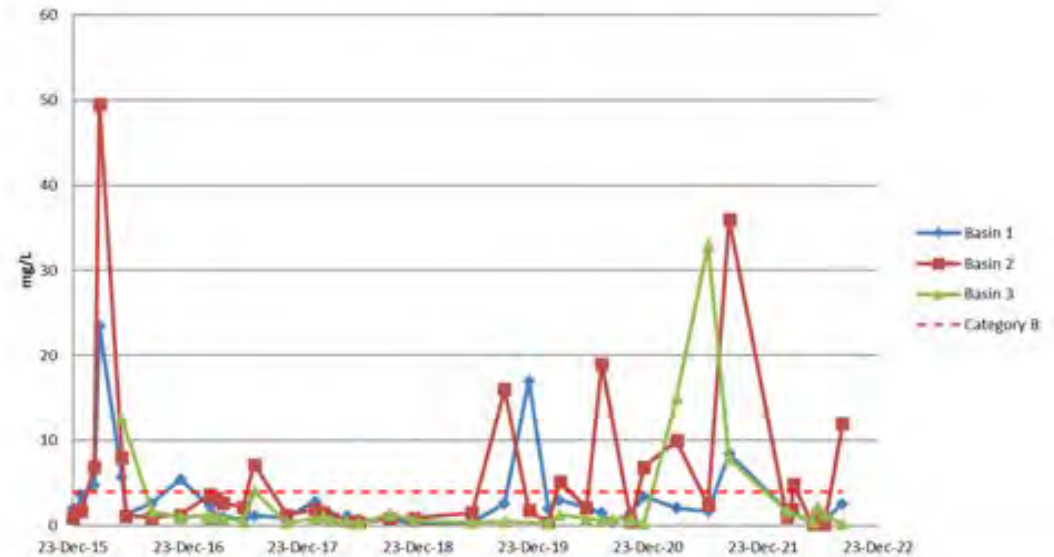
Thermotolerant Coliforms - Magnified



Nitrogen (Total)



TKN



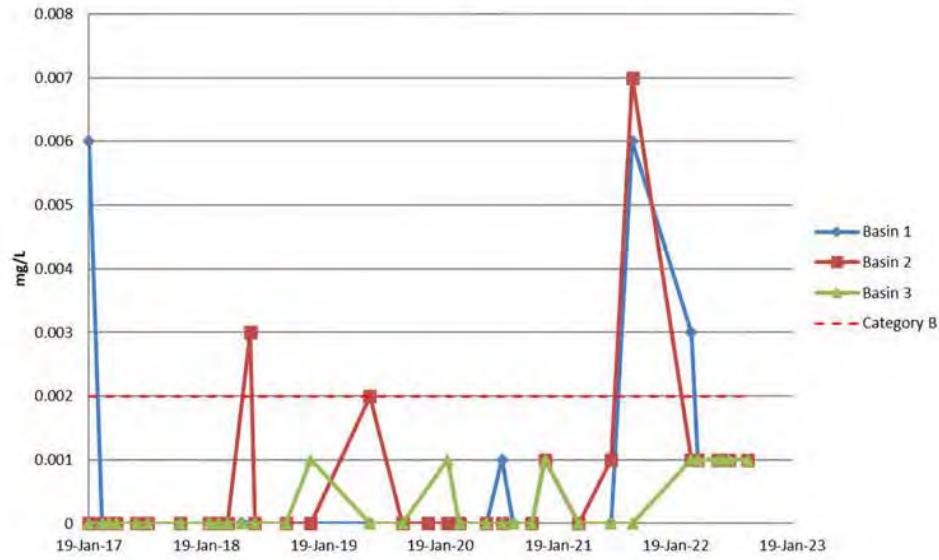
Aurizon Hexham
Long-Term Train Support Facility

Compliance Monitoring 2022
Basin 1 – Basin 3 Historical Trends

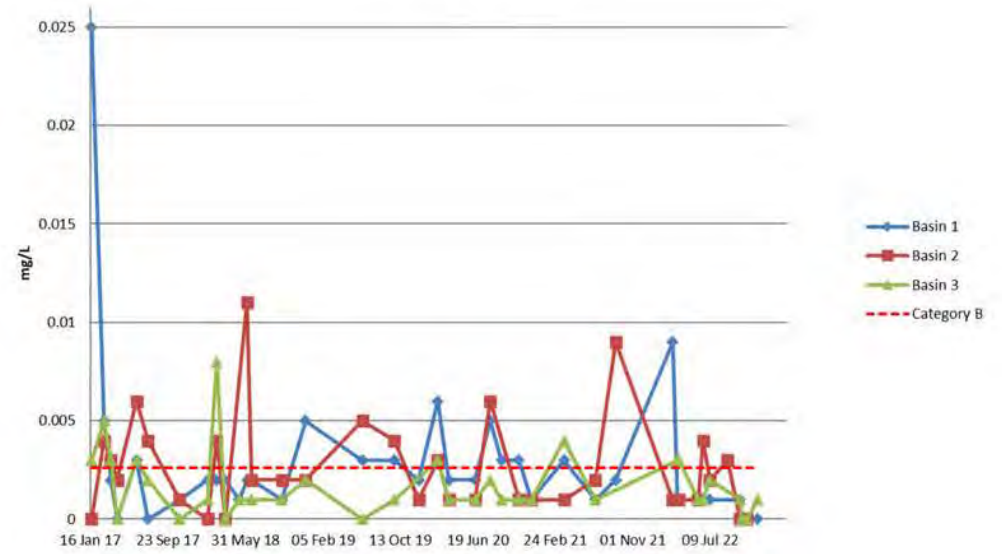
Job Number | 12584780
Revision | 0
Date | 6 February 2023

Appendix E

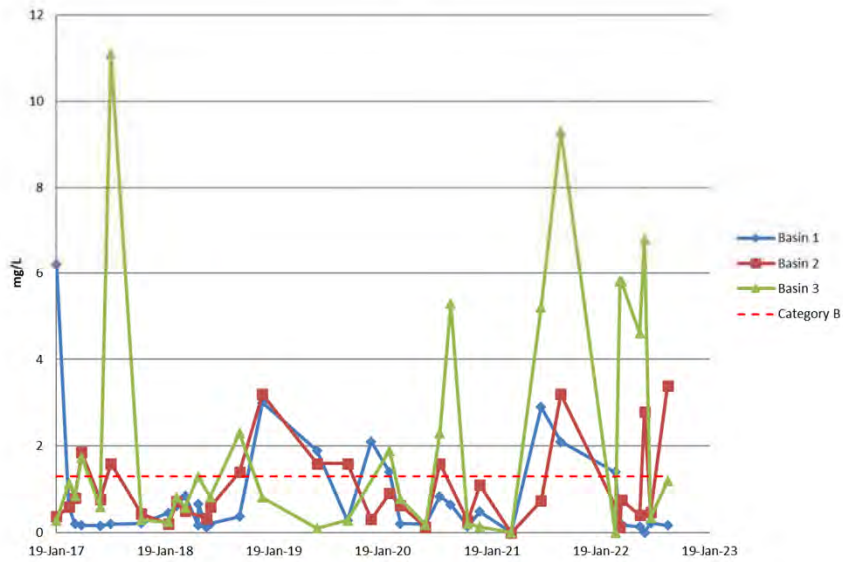
Chromium



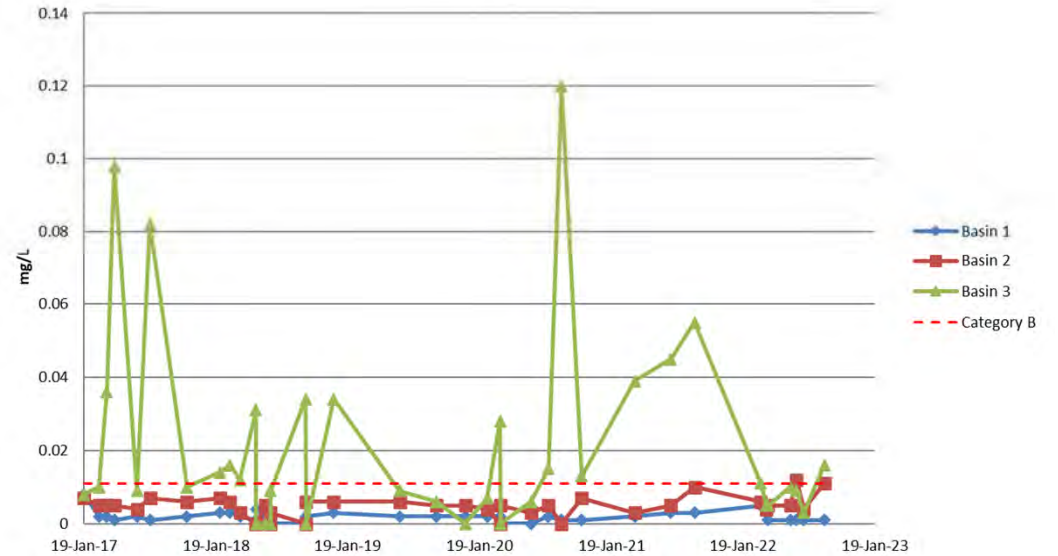
Copper



Iron



Nickel



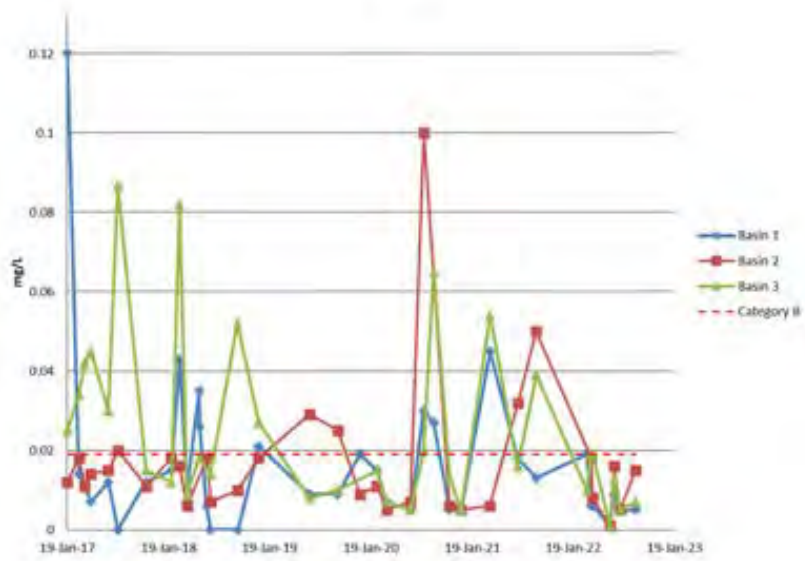
Aurizon Hexham
Long-Term Train Support Facility

Compliance Monitoring 2022
Basin 1 – Basin 3 Historical Trends

Job Number | 12584780
Revision | 0
Date | 6 February 2023

Appendix E

Zinc



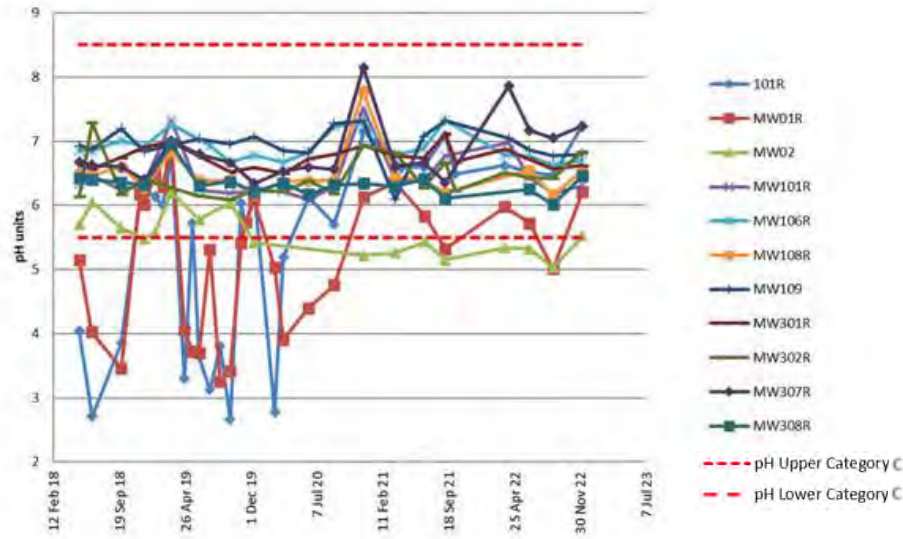
Aurizon Hexham
Long-Term Train Support Facility

Compliance Monitoring 2022
Basin 1 – Basin 3 Historical Trends

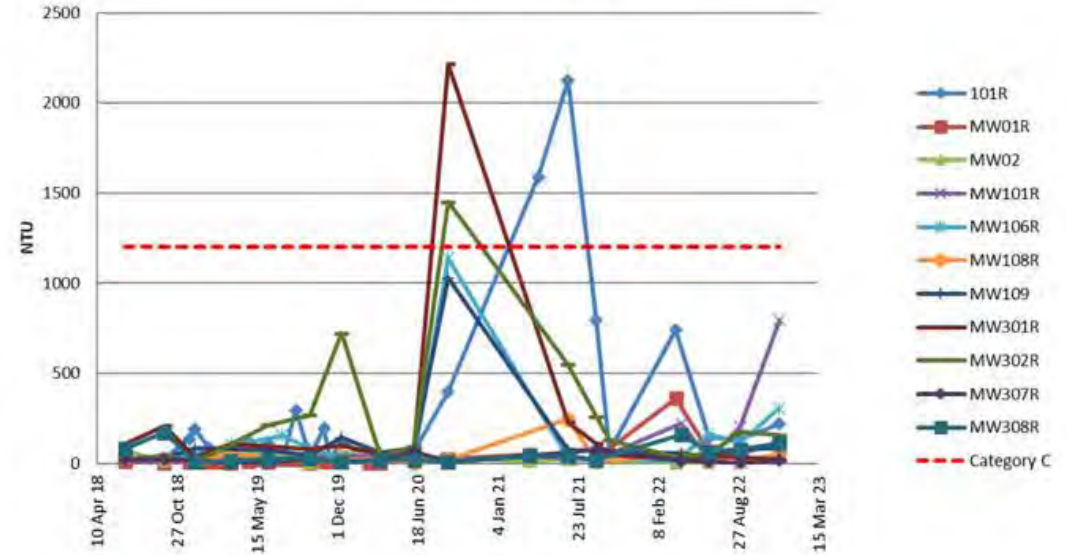
Job Number | 12584780
Revision | 0
Date | 6 February 2023

Appendix E

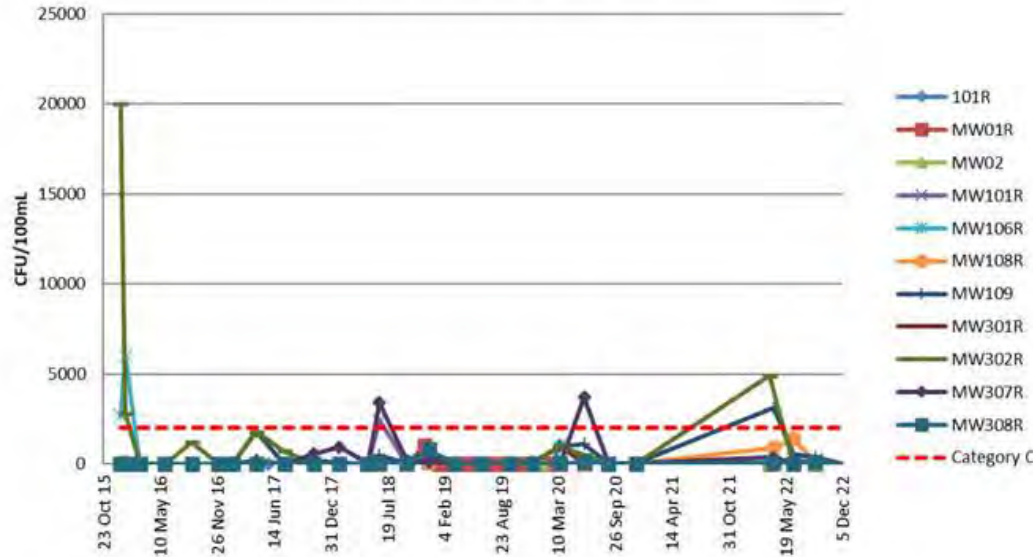
Field pH



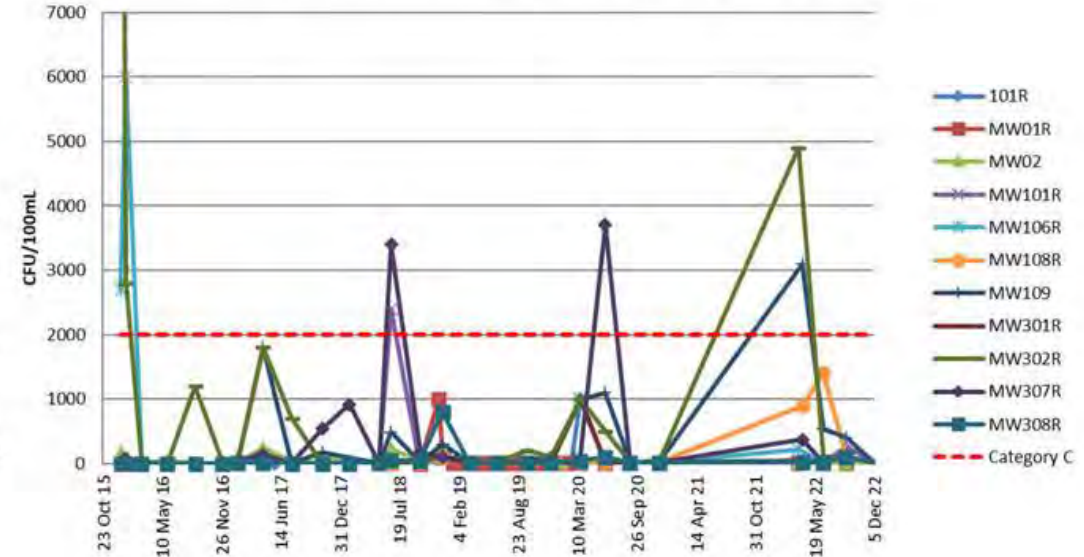
Field Turbidity



Thermotolerant Coliforms



Thermotolerant Coliforms - Magnified



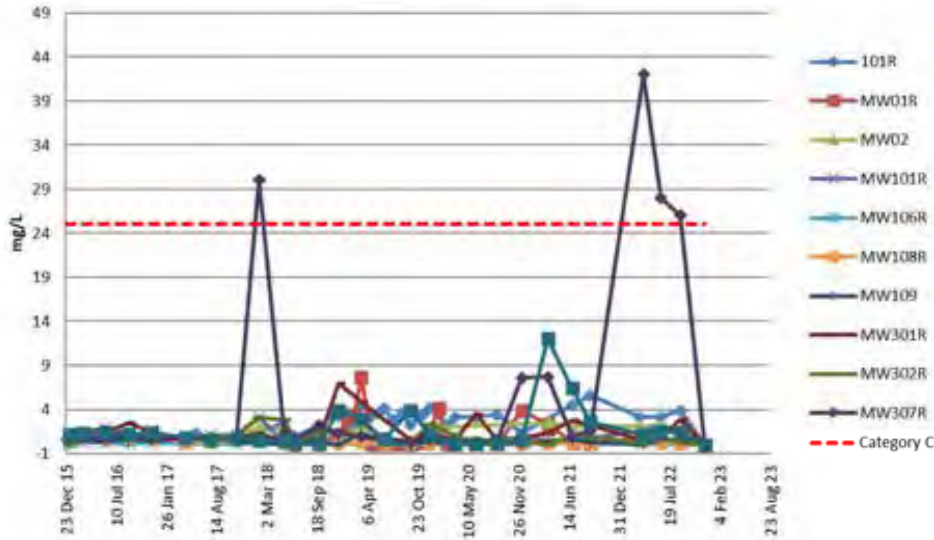
Aurizon Hexham
Long-Term Train Support Facility

Compliance Monitoring 2022
Groundwater Historical Trends

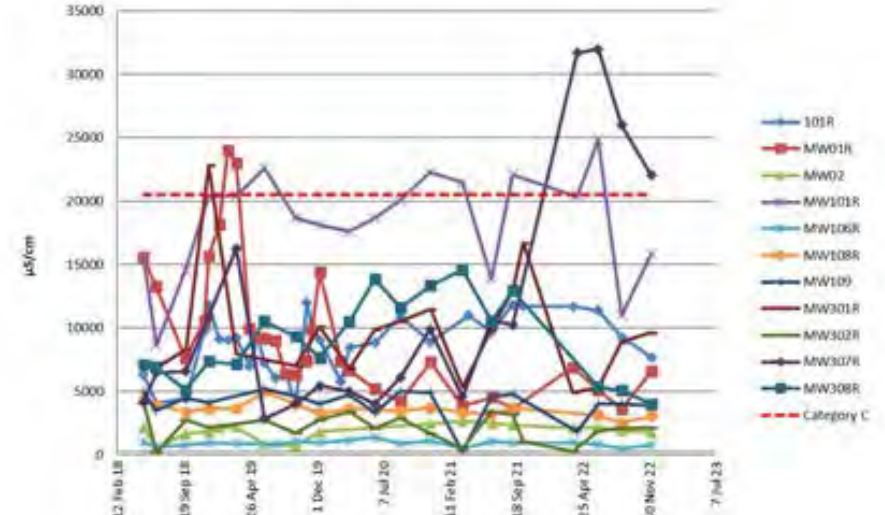
Job Number | 12584780
Revision | 0
Date | 6 February 2023

Appendix E

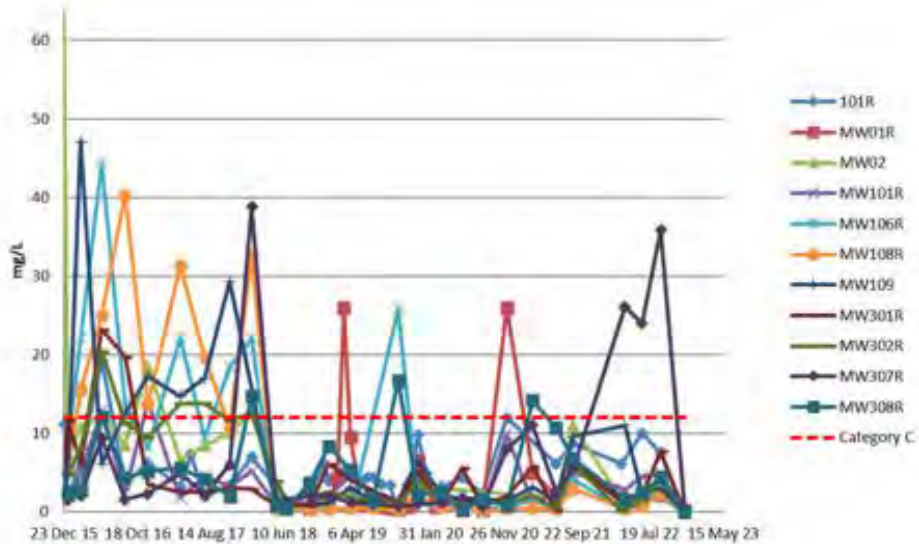
Ammonia (as N)



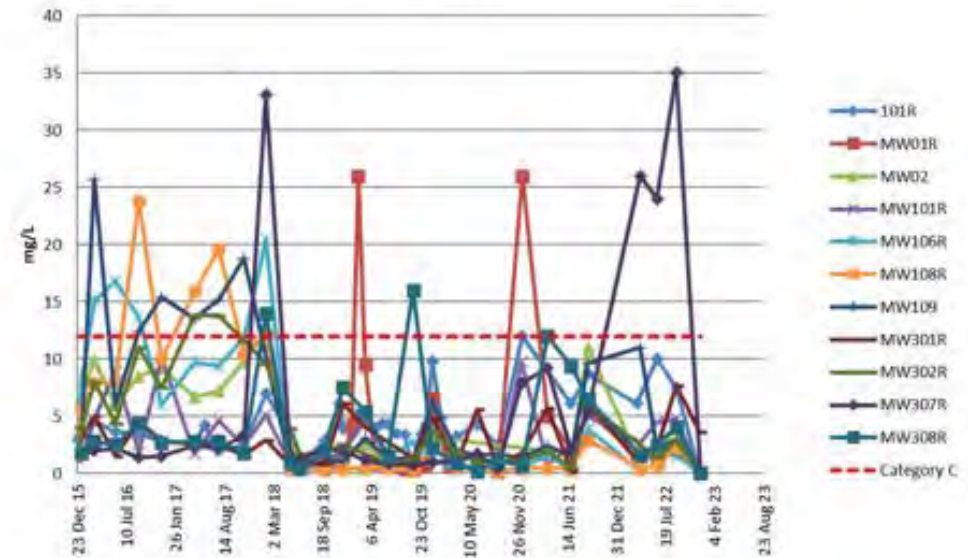
Field Electrical Conductivity



Nitrogen (Total)



TKN



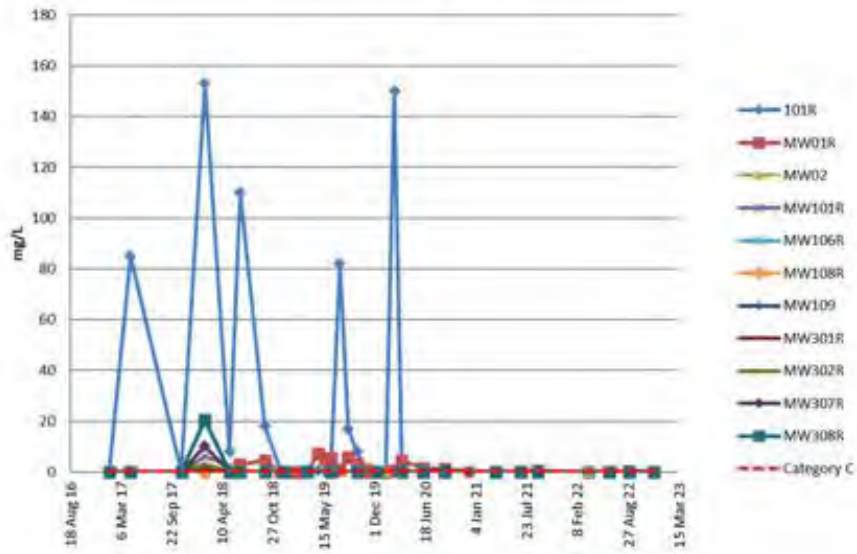
Aurizon Hexham
Long-Term Train Support Facility

Compliance Monitoring 2022
Groundwater Historical Trends

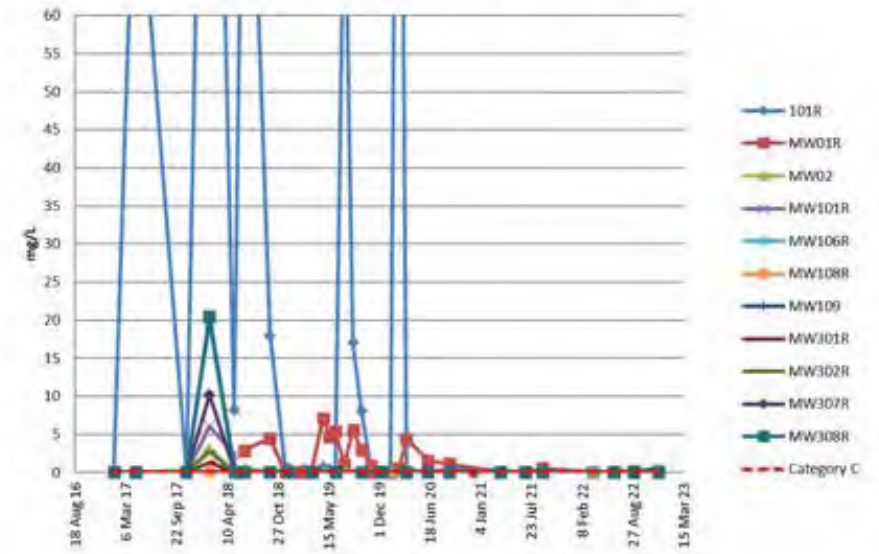
Job Number | 12584780
Revision | 0
Date | 6 February 2023

Appendix E

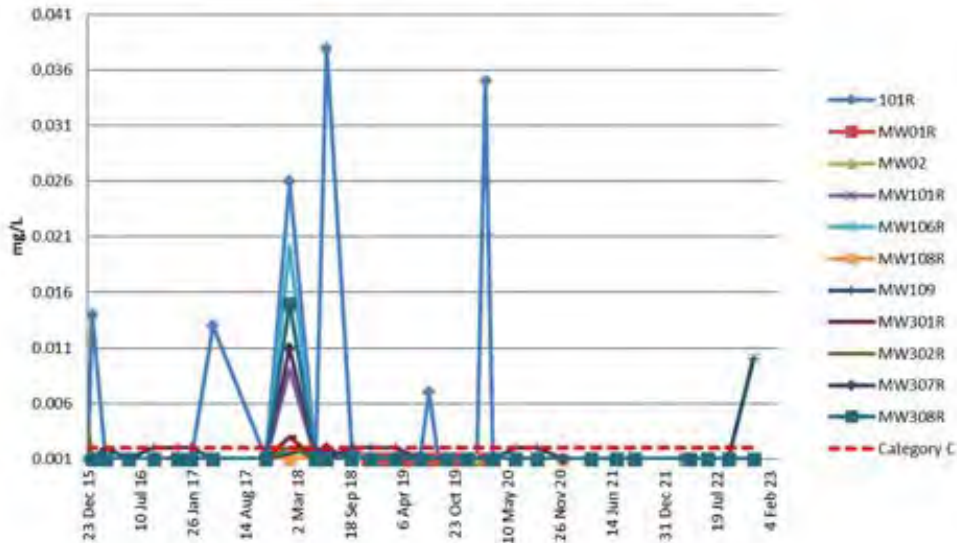
Aluminium (filtered)



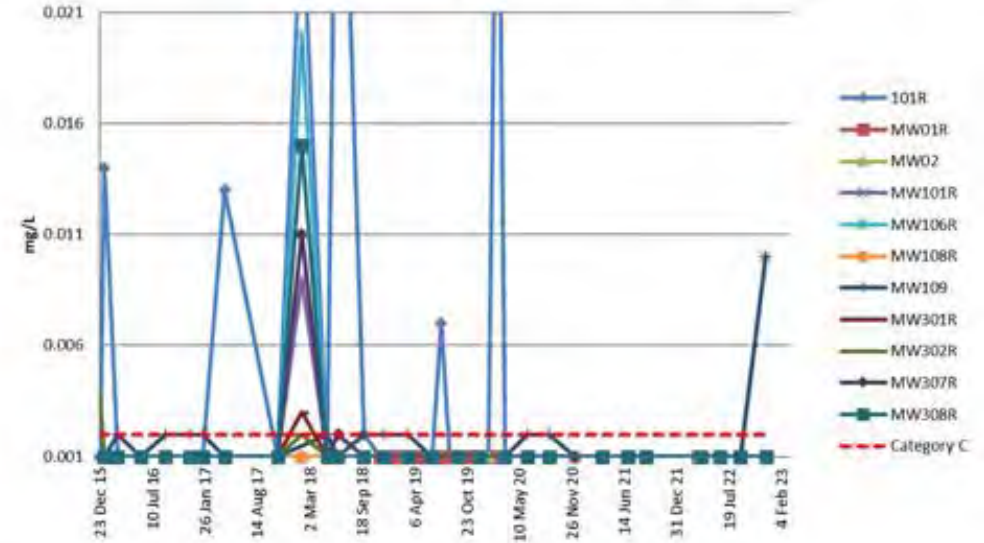
Aluminium (filtered) - Magnified



Chromium (III+VI) (filtered)



Chromium (III+VI) (filtered) - Magnified



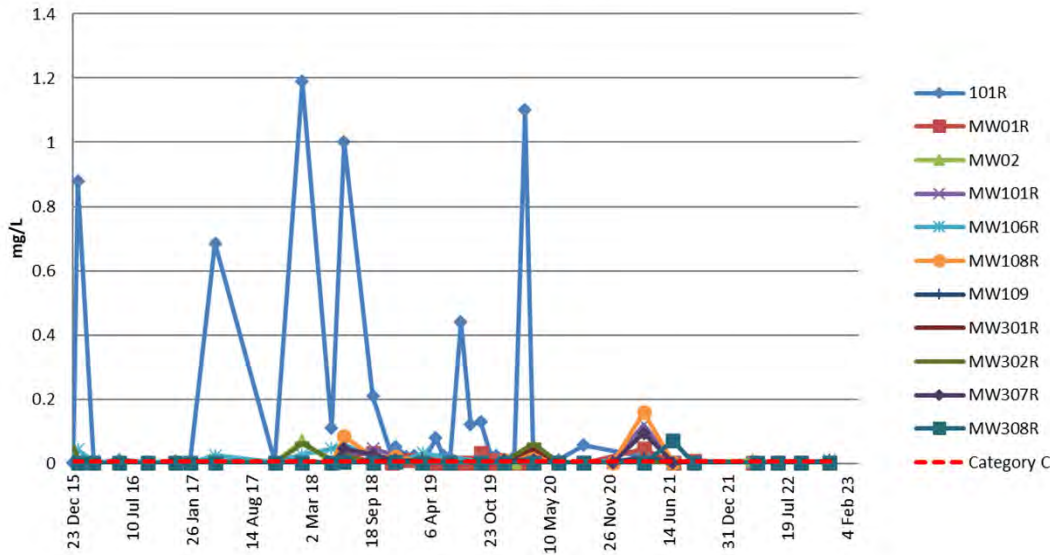
Aurizon Hexham
Long-Term Train Support Facility

Compliance Monitoring 2022
Groundwater Historical Trends

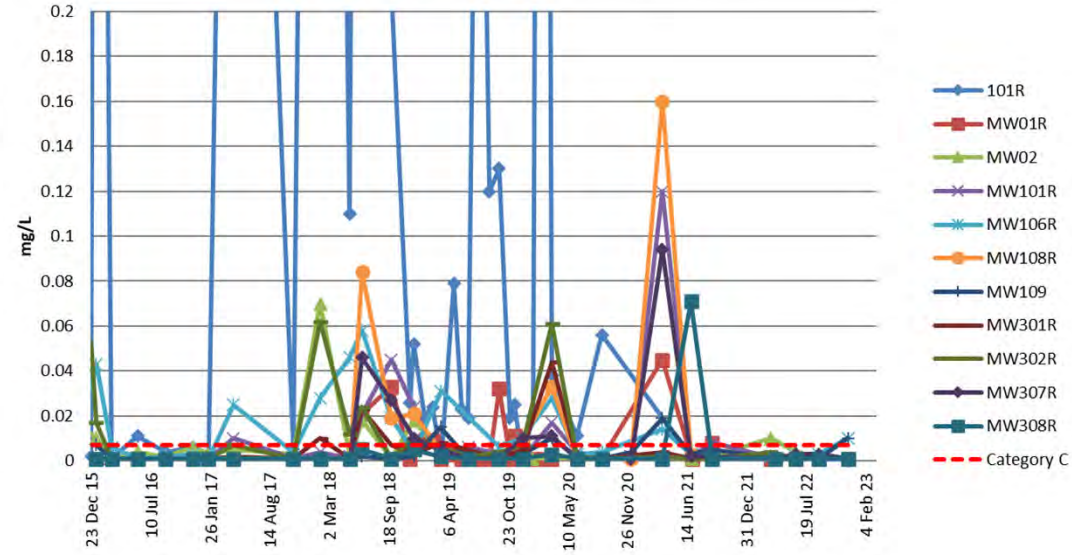
Job Number | 12584780
Revision | 0
Date | 6 February 2023

Appendix E

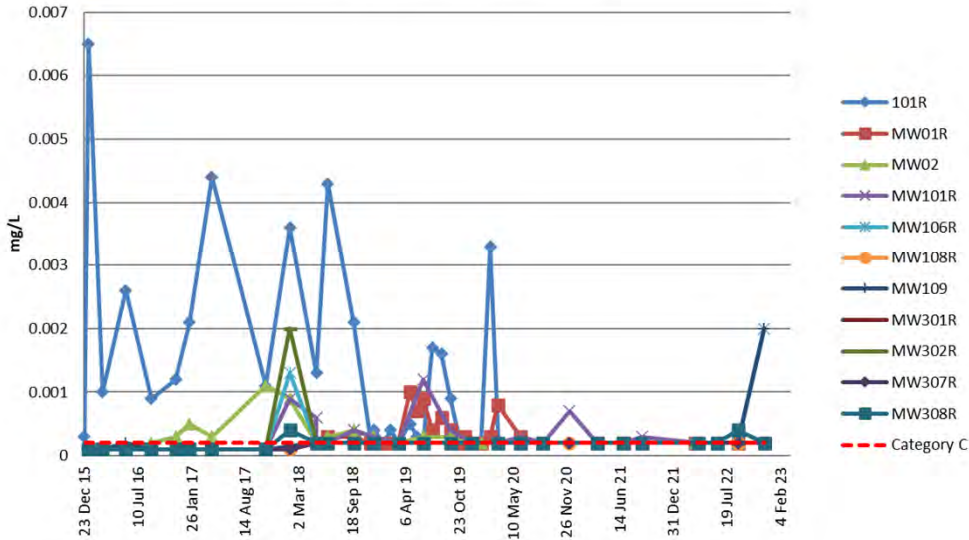
Copper (filtered)



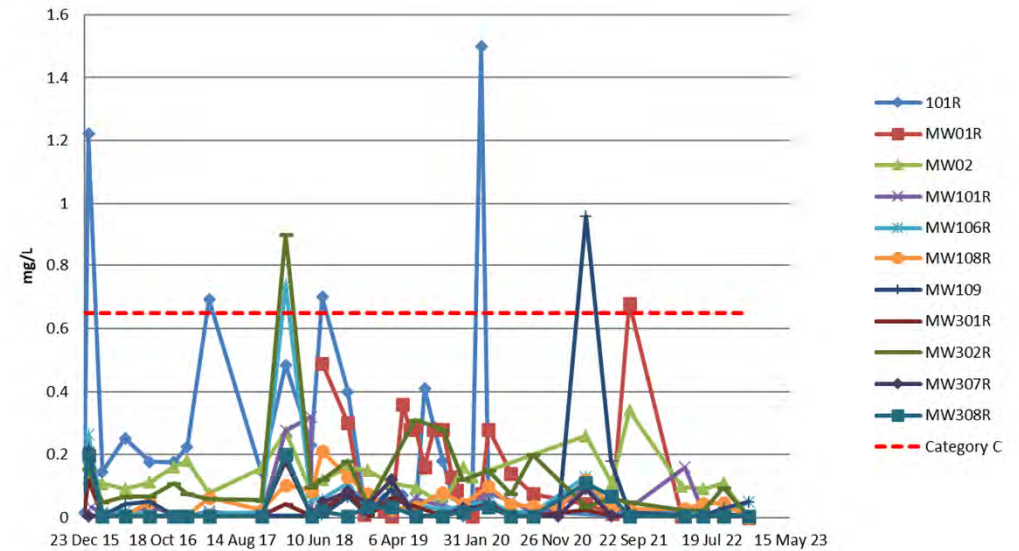
Copper (filtered) - Magnified



Cadmium (filtered)



Zinc (filtered)



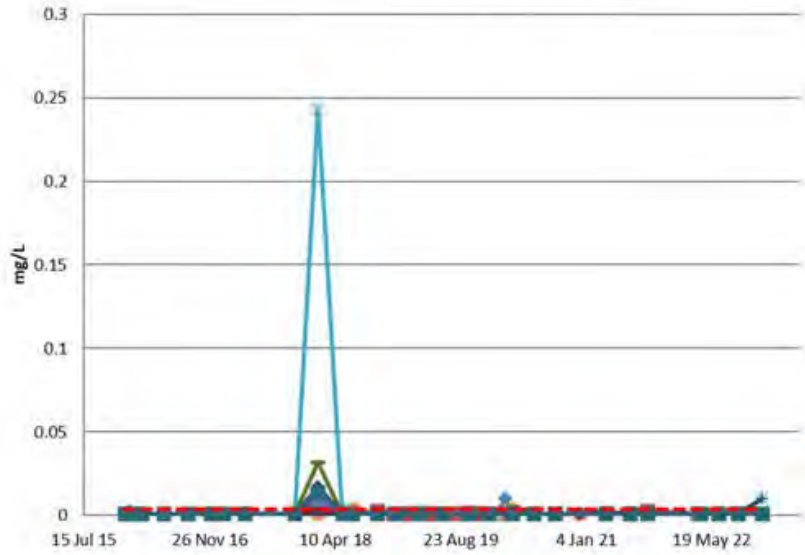
Aurizon Hexham
Long-Term Train Support Facility

Compliance Monitoring 2022
Groundwater Historical Trends

Job Number | 12584780
Revision | 0
Date | 6 February 2023

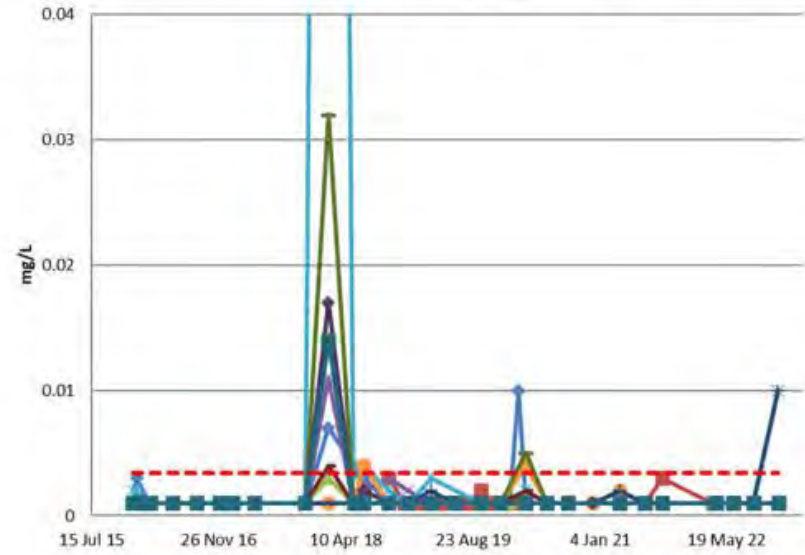
Appendix E

Lead (filtered)



- 101R
- MW01R
- MW02
- MW101R
- MW106R
- MW108R
- MW109
- MW301R
- MW302R
- MW307R
- MW308R
- Category C

Lead (filtered) - Magnified



- 101R
- MW01R
- MW02
- MW101R
- MW106R
- MW108R
- MW109
- MW301R
- MW302R
- MW307R
- MW308R
- Category C

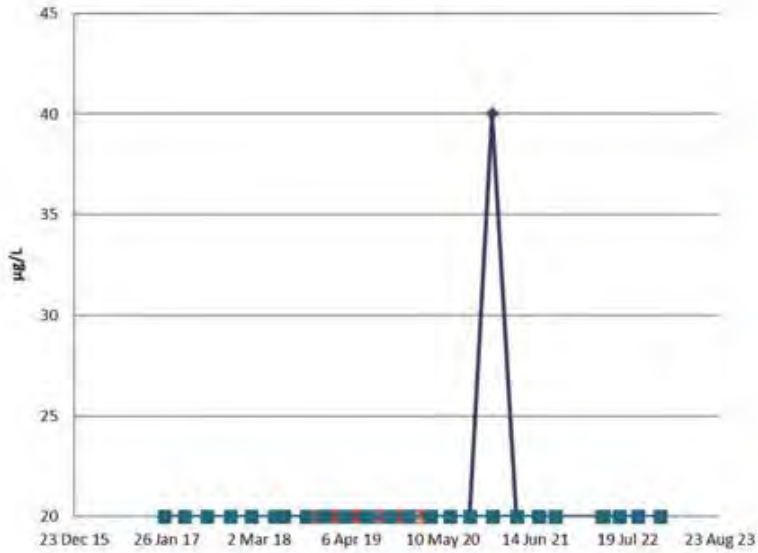


Aurizon Hexham
 Long-Term Train Support Facility
 Compliance Monitoring 2022
 Groundwater Historical Trends

Job Number | 12584780
 Revision | 0
 Date | 6 February 2023

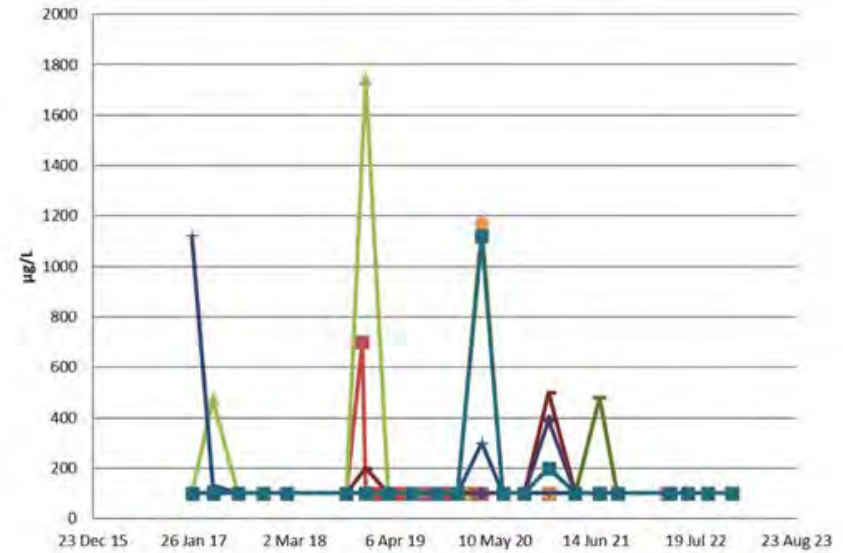
Appendix E

C6-C10 Fraction



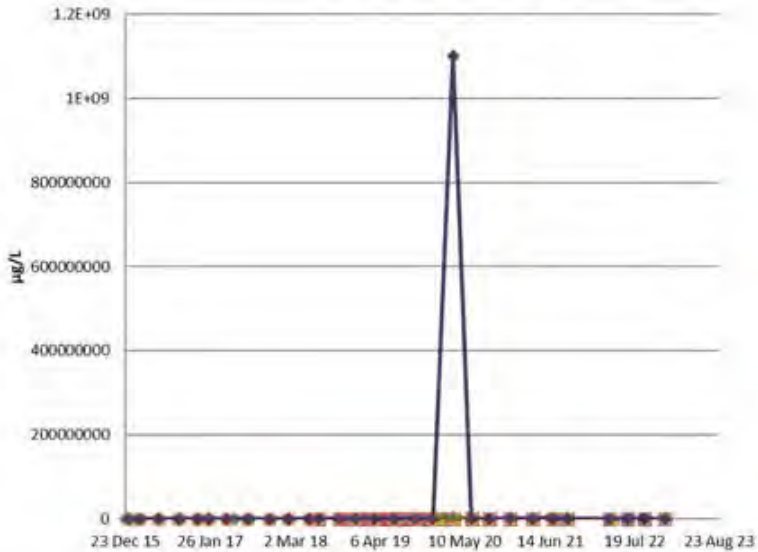
- 101R
- MW01R
- MW02
- MW101R
- MW106R
- MW108R
- MW109
- MW301R
- MW302R
- MW307R
- MW308R

>C10-C40 (Sum of Total)



- 101R
- MW01R
- MW02
- MW101R
- MW106R
- MW108R
- MW109
- MW301R
- MW302R
- MW307R
- MW308R

>C10-C36 (Sum of Total)



- 101R
- MW01R
- MW02
- MW101R
- MW106R
- MW108R
- MW109
- MW301R
- MW302R
- MW307R
- MW308R



Appendix C

Data quality objectives

The Data Quality Objectives (DQOs) for the investigation are based on guidance presented in:

- NEPC (2013) National Environment Protection (Assessment of Site Contamination) Amended Measure (NEPM) No. 1 – Schedule B2, Guideline on Site Characterisation.

The DQOs establish a framework for contamination investigations which incorporates a seven stepped continuum that defines the problem at the Site. A series of stages then optimises the design of the investigation. The seven steps are outlined below:

- Step 1: State the Problem
- Step 2: Identify the Principal Study Question
- Step 3: Inputs to the Decision
- Step 4: Boundaries of the Study
- Step 5: Decision Rules
- Step 6: Tolerable Limits on Decision Errors
- Step 7: Optimisation of the Data Collection Process

An overview of the DQOs for the investigation is presented below:

Step 1: State the problem

The site is subject to compliance monitoring during the operational phase of the TSF and Aurizon are required to comply with the monitoring requirements outlined in the OEMP.

Step 2: Identify the decision/goal of the study

The key study question to be answered as part of the works is:

- Is operation of the site impacting on or presenting risks to surface and groundwater? Do concentrations of COPC exceed the adopted assessment criteria and indicate such potential for impact?

Should results be above the criteria, do these exceedances pose a potentially unacceptable risk to human health or the environment, the other decisions to be made are:

- If detected, is surface and groundwater contamination adequately delineated?
- Is further assessment or remediation/management required?

Step 3: Identify the information inputs

The following inputs are required for the decision:

- Groundwater and surface water field parameters.
- Groundwater and surface water sampling and laboratory analysis.
- Adoption of applicable guideline values for the chemicals of potential concern (COPC).
- Confirmation that data generated by sampling and analysis are of a suitable quality to allow reliable comparison to assessment criteria as per the assessment of the Data Quality Indicators.

Step 4: Define the boundaries of the study

Define the spatial boundaries of the decision

The spatial boundaries for the site are identified as the lot boundaries comprising the total site area (including non-operational vacant areas) as shown in Figure 1.1, and down to a depth of approximately 5 m bgl⁸, which represents the underlying groundwater aquifer in the area.

Define the temporal boundaries of the decision

The time boundaries for this investigation is the period of January to December 2022, inclusive of historical records backdating to December 2015.

⁸ Vertical limit approximated from depth of wells below ground level (bgl).

Define the scale of decision-making

The scale of the decision-making is limited to the lateral extent of the monitoring well and surface water network.

Identify any potential constraints on data collection

Sample locations may be restricted by vegetation and other infrastructure during the time of sampling, and access to wells adjacent to the railway line (Road 1) may be restricted by site activities (train movement, scheduled works etc.).

Step 5: Decision rules

The degree of impact by contaminants and the decisions associated with accepting data will be assessed with reference to the adopted site investigation levels. Site specific investigation levels (discharge criteria) were developed by Douglas Partners (DP, 2014) and are discussed further in Section 3.

The decision rule was considered to be:

- If concentrations of the COPC in groundwater and surface water on-site exceed the adopted site discharge criteria, then further investigation of longer term trends, and possible source identification and delineation, will be required. Continued exceedances in longer term trends of identification of contamination source/s will trigger contingency responses as outlined in the OEMP.

Step 6: Tolerable limits on decision errors

Data generated during this investigation must be appropriate to allow decisions to be made with confidence.

Two types of decision errors are possible:

- Surface and groundwater at the site is considered 'uncontaminated' when in fact it is contaminated (false negative).
- Surface and groundwater at the site is considered 'contaminated' when in fact it is not contaminated (false positive).

The implications of false negative decision errors are considered less acceptable than that of false positives. False negative errors could involve unknown unacceptable risk/s to human health and/or the environment, and potentially lead to litigation action if the site is found to be unsuitable for ongoing use in the future. Conservative investigation criteria which incorporate a safety factor should therefore be applied. As noted, discharge criteria for the site have been established by Douglas Partners. GHD has not reviewed the conservativeness of these criteria.

The risks associated with the false positive errors are primarily limited to additional, unwarranted investigation and/or remediation costs. The risk of false positive errors occurring will be minimised by reducing the potential for unrepresentative data which could arise from the following causes:

- Sampling errors which occur when the sampling program does not adequately detect the variability of a contaminant from point to point across the site, (i.e., the samples collected are not representative of the site conditions).
- Measurement errors which occur during sample collection, handling preparation, analysis and data reduction.

The potential for such errors are reduced by the works being carried out by experienced and trained professionals employing specific and repeatable methodologies and implementing a QA program.

The QA/QC assessment will include data quality indicators (DQIs) for completeness, comparability, representativeness, precision and accuracy.

The DQIs for sampling techniques and laboratory analysis of collected samples identifies the acceptable level of error for this investigation. The data quality objectives will be assessed by reference to data quality indicators as follows:

- Data representativeness - expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples in appropriate locations across the site, and by using an adequate number of sample locations to characterise soil, groundwater and soil vapour at and surrounding the site. Consistent and repeatable sampling techniques and methods are utilised throughout the sampling.
- Completeness - defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study. If there is insufficient valid data, then additional data are required to be collected.
- Comparability - is a qualitative parameter expressing the confidence with which one data set can be compared with the other. This is achieved through maintaining a level of consistency in techniques used to collect samples and ensuring analysing laboratories use consistent analysis techniques and reporting methods.
- Precision - measures the reproducibility of measurements under a given set of conditions. The precision of the data is assessed by calculating the Relative Percent Difference (RPD) between duplicate sample pairs.

$$RPD(\%) = \frac{|C_o - C_d|}{C_o + C_d} \times 200$$

Where Co = Analyte concentration of the original sample

Cd = Analyte concentration of the duplicate sample

GHD adopts a nominal acceptance criterion of $\pm 50\%$ RPD for field duplicates and splits for organics and an acceptance criterion of $\pm 30\%$ RPD for inorganics. However, it is noted that this will not always be achieved, particularly at low analyte concentrations:

- Accuracy - measures the bias in a measurement system. Accuracy can be undermined by such factors as field contamination of samples, poor preservation of samples, poor sample preparation techniques and poor selection of analytical techniques by the analysing laboratory. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes, laboratory blanks and analyses against reference standards. The nominal “acceptance limits” on laboratory control samples are defined as follows
 - Laboratory spikes – 60-130% recovery for metals/inorganics and 60-140% for organics.
 - Laboratory duplicates – Nominal RPD values of 30% or lower. Higher RPD values are generally considered acceptable when the result is close to the LOR.
 - Laboratory Surrogates (Organics only) – 60% - 130% recovery.
 - Laboratory blanks - <LOR.

If any of the DQIs are not met, further investigation will be necessary to determine whether the non-conformance will significantly affect the usefulness of the data.

Step 7: Optimisation of the data collection process

This step involves identifying the most resource effective sampling and analysis design, which is required to satisfy the DQOs. The sampling and analysis plan, which was developed to meet this objective.

Appendix D

Quarterly sampling methodology

General

A summary of the methods employed for monitoring conducted in 2022 is outlined below. Field sampling methodology was conducted in accordance with GHD's sampling SAQP.

Refer to individual reports for detailed sampling methodology and laboratory analytical program (GHD 2022a to 2022c, and 2023a).

HSE

A project specific JSEA was prepared prior to attending site each monitoring round.

All field work was conducted by suitably experienced professionals inducted to the site and who actively participated in the development of the JSEA.

2022 sampling schedule

Table 2.3 provides the 2022 sampling schedule completed at the site.

Laboratory analysis

Water samples were submitted to laboratories accredited by NATA. Specifically, primary and duplicate samples were submitted to Eurofins Mgt (Eurofins) and triplicate samples to ALS Environmental (ALS). The laboratory analytical suite is as per the OEMP.

Table D-1 Hexham water quality analytical suite

Parameter		Units
Physico-chemical	BOD	mg/L
	Conductivity	µS/cm
	pH	pH Units
	Turbidity	NTU
	Total Susp. Solids	mg/L
Heavy Metals	Aluminium (Al)	mg/L
	Arsenic (As)	mg/L
	Cadmium (Cd)	mg/L
	Chromium (Cr)	mg/L
	Copper (Cu)	mg/L
	Iron (Fe)	mg/L
	Lead (Pb)	mg/L
	Mercury (Hg)	mg/L
	Nickel (Ni)	mg/L
	Zinc (Zn)	mg/L
Nutrients	Ammonia	mg/L
	TKN	mg/L
	Total Nitrogen	mg/L
	Total Phosphorus	mg/L
Microbiological	Faecal Coliforms	cfu/100mL
Total hydrocarbon fractions	TRH C6-C36	µg/L
Polycyclic aromatic hydrocarbons	Naphthalene	µg/L
	Phenanthrene	µg/L

Parameter		Units
	Anthracene	µg/L
	Fluoranthene	µg/L
	Benzo(a) pyrene	µg/L
	Total PAHs	µg/L
Volatile hydrocarbons	Benzene	µg/L
	Ethyl Benzene	µg/L
	Toluene	µg/L
	Xylenes (total)	µg/L
	Naphthalene	µg/L

Note: Analysis for surface water metals are to be **total metals** and groundwater is to be **dissolved metals** (filtered)

Appendix E

Laboratory reports

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **Alyssa Barron**

Report **869645-W**
Project name **AURIZON HEXHAM WATER MONITORING**
Project ID **12552139**
Received Date **Mar 09, 2022**

Client Sample ID			SW1 Water N22-Ma17526 Mar 09, 2022	SW2 Water N22-Ma17527 Mar 09, 2022	SW3 Water N22-Ma17528 Mar 09, 2022	SW4 Water N22-Ma17529 Mar 09, 2022
Sample Matrix	LOR	Unit				
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	97	100	97	97
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			SW1 Water N22-Ma17526 Mar 09, 2022	SW2 Water N22-Ma17527 Mar 09, 2022	SW3 Water N22-Ma17528 Mar 09, 2022	SW4 Water N22-Ma17529 Mar 09, 2022
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	135	138	80	129
p-Terphenyl-d14 (surr.)	1	%	135	83	85	92
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Water Quality Parameters						
Ammonia (as N)	0.01	mg/L	0.04	0.08	< 0.01	0.10
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	< 5	10	22
Conductivity (at 25°C)	10	uS/cm	420	990	510	1900
Nitrate & Nitrite (as N)	0.05	mg/L	0.24	< 0.05	< 0.05	< 0.05
pH (at 25 °C)	0.1	pH Units	7.8	8.0	7.3	7.8
Phosphate total (as P)	0.01	mg/L	1.5	1.5	4.6	8.7
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	2.2	1.9	7.6	9.4
Total Nitrogen (as N)*	0.1	mg/L	2.44	1.9	7.6	9.4
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	30	16	68	290
Turbidity	1	NTU	33	6.8	22	160
Heavy Metals						
Aluminium	0.05	mg/L	0.61	0.10	1.1	0.45
Arsenic	0.001	mg/L	0.006	0.005	0.003	0.004
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	0.002	0.002	0.002	< 0.001
Copper	0.001	mg/L	0.011	0.003	0.004	0.004
Iron	0.05	mg/L	2.4	2.3	3.8	16
Lead	0.001	mg/L	0.006	0.002	0.003	0.002
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.006	0.007	0.005	0.005
Zinc	0.005	mg/L	0.039	0.009	0.015	0.024
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			SW4A Water N22-Ma17530 Mar 09, 2022	SW5 Water N22-Ma17531 Mar 09, 2022	SW6 Water N22-Ma17532 Mar 09, 2022	SW7 Water N22-Ma17533 Mar 09, 2022
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			SW4A	SW5	SW6	SW7
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			N22-Ma17530	N22-Ma17531	N22-Ma17532	N22-Ma17533
Date Sampled			Mar 09, 2022	Mar 09, 2022	Mar 09, 2022	Mar 09, 2022
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	102	96	98	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	128	97	138	126
p-Terphenyl-d14 (surr.)	1	%	77	125	82	77
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Water Quality Parameters						
Ammonia (as N)	0.01	mg/L	0.33	0.20	< 0.01	0.05
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	24	6.8	7.5	< 5
Conductivity (at 25°C)	10	uS/cm	1800	1200	710	840
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
pH (at 25 °C)	0.1	pH Units	7.8	7.5	7.7	7.6
Phosphate total (as P)	0.01	mg/L	9.7	2.0	0.50	0.33
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	9.1	3.3	3.4	1.9
Total Nitrogen (as N)*	0.1	mg/L	9.1	3.3	3.4	1.9
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	530	240	160	22
Turbidity	1	NTU	550	300	200	30

Client Sample ID			SW4A Water N22-Ma17530 Mar 09, 2022	SW5 Water N22-Ma17531 Mar 09, 2022	SW6 Water N22-Ma17532 Mar 09, 2022	SW7 Water N22-Ma17533 Mar 09, 2022
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	0.45	0.25	0.24	0.11
Arsenic	0.001	mg/L	0.006	0.011	0.004	0.002
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	0.001	< 0.001	< 0.001	0.002
Copper	0.001	mg/L	0.006	0.004	0.002	0.002
Iron	0.05	mg/L	41	42	65	5.3
Lead	0.001	mg/L	0.002	0.002	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.006	0.023	0.007	0.007
Zinc	0.005	mg/L	0.040	0.024	0.012	0.030
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			SW11 Water N22-Ma17534 Mar 09, 2022	BASIN 1 Water N22-Ma17535 Mar 09, 2022	BASIN 2 Water N22-Ma17536 Mar 09, 2022	BASIN 3 Water N22-Ma17537 Mar 09, 2022
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	104	103	102	104
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			SW11	BASIN 1	BASIN 2	BASIN 3
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			N22-Ma17534	N22-Ma17535	N22-Ma17536	N22-Ma17537
Date Sampled			Mar 09, 2022	Mar 09, 2022	Mar 09, 2022	Mar 09, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	139	136	125	139
p-Terphenyl-d14 (surr.)	1	%	75	89	76	78
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Water Quality Parameters						
Ammonia (as N)	0.01	mg/L	0.07	< 0.01	< 0.01	< 0.01
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	5.6	< 5	< 5	< 5
Conductivity (at 25°C)	10	uS/cm	1100	430	730	1100
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
pH (at 25 °C)	0.1	pH Units	7.9	7.9	8.1	7.6
Phosphate total (as P)	0.01	mg/L	2.1	0.67	0.29	0.98
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	4.0	1.9	1.1	1.7
Total Nitrogen (as N)*	0.1	mg/L	4	1.9	1.1	1.7
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	80	38	6.3	20
Turbidity	1	NTU	17	2.1	4.0	7.7
Heavy Metals						
Aluminium	0.05	mg/L	0.41	0.25	0.07	0.09
Arsenic	0.001	mg/L	0.003	0.007	0.001	< 0.001
Cadmium	0.0002	mg/L	< 0.0002	0.0003	< 0.0002	< 0.0002
Chromium	0.001	mg/L	0.001	0.003	< 0.001	< 0.001
Copper	0.001	mg/L	0.002	0.009	0.001	< 0.001
Iron	0.05	mg/L	2.9	1.4	0.63	5.5
Lead	0.001	mg/L	< 0.001	0.004	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.008	0.005	0.006	0.011
Zinc	0.005	mg/L	0.013	0.019	< 0.005	0.010
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Mar 11, 2022	7 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Melbourne	Mar 11, 2022	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Mar 11, 2022	7 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Mar 11, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Mar 11, 2022	7 Days
Ammonia (as N) - Method: APHA 4500-NH3 Ammonia Nitrogen by FIA	Melbourne	Mar 11, 2022	28 Days
Biochemical Oxygen Demand (BOD-5 Day) - Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water	Melbourne	Mar 11, 2022	2 Days
Conductivity (at 25°C) - Method: LTM-INO-4030 Conductivity	Melbourne	Mar 11, 2022	28 Days
pH (at 25 °C) - Method: LTM-GEN-7090 pH in water by ISE	Melbourne	Mar 11, 2022	0 Hours
Total Suspended Solids Dried at 103°C–105°C - Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry	Melbourne	Mar 11, 2022	7 Days
Turbidity - Method: Turbidity by classical using APHA 2130B (LTM-INO-4140)	Melbourne	Mar 15, 2022	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Mar 11, 2022	28 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Mar 11, 2022	28 Days
Thermotolerant Coliforms (CFU) - Method: LTM-MIC-6607 Microbes by Membrane Filtration AS/NZS 4276.7:2007	WaterTestingVic	Mar 09, 2022	24 Hours
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N) - Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA	Melbourne	Mar 11, 2022	28 Days
Total Kjeldahl Nitrogen (as N) - Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA	Melbourne	Mar 11, 2022	28 Days
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphate total (as P) - Method: LTM-INO-4040 Phosphate by CFA	Melbourne	Mar 15, 2022	28 Days

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.: 12552139
Report #: 869645
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Mar 9, 2022 11:30 AM
Due: Mar 16, 2022
Priority: 5 Day
Contact Name: Alyssa Barron

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12552139

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Ammonia (as N)	Biochemical Oxygen Demand (BOD-5 Day)	Conductivity (at 25°C)	Iron	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103°C-105°C	Turbidity	Metals M8	Eurofins Suite B4	Eurofins Suite B19A: Total N (TKN, NO _x), Total P
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X		X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																	
Brisbane Laboratory - NATA # 1261 Site # 20794																	
Mayfield Laboratory - NATA # 1261 Site # 25079																	
Perth Laboratory - NATA # 2377 Site # 2370																	
External Laboratory												X					
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID												
1	SW1	Mar 09, 2022		Water	N22-Ma17526	X	X	X	X	X	X	X	X	X	X	X	X
2	SW2	Mar 09, 2022		Water	N22-Ma17527	X	X	X	X	X	X	X	X	X	X	X	X
3	SW3	Mar 09, 2022		Water	N22-Ma17528	X	X	X	X	X	X	X	X	X	X	X	X
4	SW4	Mar 09, 2022		Water	N22-Ma17529	X	X	X	X	X	X	X	X	X	X	X	X
5	SW4A	Mar 09, 2022		Water	N22-Ma17530	X	X	X	X	X	X	X	X	X	X	X	X
6	SW5	Mar 09, 2022		Water	N22-Ma17531	X	X	X	X	X	X	X	X	X	X	X	X
7	SW6	Mar 09, 2022		Water	N22-Ma17532	X	X	X	X	X	X	X	X	X	X	X	X
8	SW7	Mar 09, 2022		Water	N22-Ma17533	X	X	X	X	X	X	X	X	X	X	X	X
9	SW11	Mar 09, 2022		Water	N22-Ma17534	X	X	X	X	X	X	X	X	X	X	X	X

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.: 12552139
Report #: 869645
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Mar 9, 2022 11:30 AM
Due: Mar 16, 2022
Priority: 5 Day
Contact Name: Alyssa Barron

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12552139

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Ammonia (as N)	Biochemical Oxygen Demand (BOD-5 Day)	Conductivity (at 25°C)	Iron	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103°C-105°C	Turbidity	Metals M8	Eurofins Suite B4	Eurofins Suite B19A: Total N (TKN, NO _x), Total P
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X		X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																	
Brisbane Laboratory - NATA # 1261 Site # 20794																	
Mayfield Laboratory - NATA # 1261 Site # 25079																	
Perth Laboratory - NATA # 2377 Site # 2370																	
External Laboratory												X					
10	BASIN 1	Mar 09, 2022		Water	N22-Ma17535	X	X	X	X	X	X	X	X	X	X	X	X
11	BASIN 2	Mar 09, 2022		Water	N22-Ma17536	X	X	X	X	X	X	X	X	X	X	X	X
12	BASIN 3	Mar 09, 2022		Water	N22-Ma17537	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						12	12	12	12	12	12	12	12	12	12	12	12

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	mg/L	< 5			5	Pass	
Conductivity (at 25°C)	uS/cm	< 10			10	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Phosphate total (as P)	mg/L	< 0.01			0.01	Pass	
Total Suspended Solids Dried at 103°C–105°C	mg/L	< 5			5	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/L	< 0.05			0.05	Pass	
Arsenic	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Iron	mg/L	< 0.05			0.05	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	95			70-130	Pass	
TRH C10-C14	%	104			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	89			70-130	Pass	
Toluene	%	92			70-130	Pass	
Ethylbenzene	%	103			70-130	Pass	
m&p-Xylenes	%	80			70-130	Pass	
Xylenes - Total*	%	80			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	112			70-130	Pass	
TRH C6-C10	%	94			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	115			70-130	Pass	
Acenaphthylene	%	83			70-130	Pass	
Anthracene	%	85			70-130	Pass	
Benz(a)anthracene	%	96			70-130	Pass	
Benzo(a)pyrene	%	87			70-130	Pass	
Benzo(b&j)fluoranthene	%	107			70-130	Pass	
Benzo(g,h,i)perylene	%	117			70-130	Pass	
Benzo(k)fluoranthene	%	100			70-130	Pass	
Chrysene	%	112			70-130	Pass	
Dibenz(a,h)anthracene	%	117			70-130	Pass	
Fluoranthene	%	106			70-130	Pass	
Fluorene	%	118			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	118			70-130	Pass	
Naphthalene	%	100			70-130	Pass	
Phenanthrene	%	105			70-130	Pass	
Pyrene	%	115			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	104			70-130	Pass	
LCS - % Recovery							
Ammonia (as N)	%	76			70-130	Pass	
Conductivity (at 25°C)	%	98			70-130	Pass	
Nitrate & Nitrite (as N)	%	101			70-130	Pass	
Phosphate total (as P)	%	98			70-130	Pass	
Total Suspended Solids Dried at 103°C–105°C	%	92			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium	%	96			80-120	Pass	
Arsenic	%	93			80-120	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium				%	100			80-120	Pass	
Chromium				%	93			80-120	Pass	
Copper				%	93			80-120	Pass	
Iron				%	101			80-120	Pass	
Lead				%	94			80-120	Pass	
Mercury				%	84			80-120	Pass	
Nickel				%	93			80-120	Pass	
Zinc				%	96			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					Result 1					
TRH C6-C9	M22-Ma21083	NCP	%	107				70-130	Pass	
TRH C10-C14	B22-Ma21318	NCP	%	86				70-130	Pass	
Spike - % Recovery										
BTEX					Result 1					
Benzene	M22-Ma21083	NCP	%	97				70-130	Pass	
Toluene	M22-Ma21083	NCP	%	100				70-130	Pass	
Ethylbenzene	M22-Ma21083	NCP	%	111				70-130	Pass	
m&p-Xylenes	M22-Ma21083	NCP	%	80				70-130	Pass	
o-Xylene	M22-Ma21083	NCP	%	85				70-130	Pass	
Xylenes - Total*	M22-Ma21083	NCP	%	82				70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1					
Naphthalene	M22-Ma21083	NCP	%	125				70-130	Pass	
TRH C6-C10	M22-Ma21083	NCP	%	102				70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1					
TRH >C10-C16	B22-Ma21318	NCP	%	87				70-130	Pass	
Spike - % Recovery										
					Result 1					
Total Suspended Solids Dried at 103°C-105°C	M22-Ma18768	NCP	%	147				70-130	Fail	Q08
Spike - % Recovery										
Heavy Metals					Result 1					
Iron	M22-Ma23150	NCP	%	91				75-125	Pass	
Spike - % Recovery										
Heavy Metals					Result 1					
Aluminium	N22-Ma17534	CP	%	94				75-125	Pass	
Arsenic	N22-Ma17534	CP	%	97				75-125	Pass	
Cadmium	N22-Ma17534	CP	%	103				75-125	Pass	
Chromium	N22-Ma17534	CP	%	96				75-125	Pass	
Copper	N22-Ma17534	CP	%	96				75-125	Pass	
Lead	N22-Ma17534	CP	%	97				75-125	Pass	
Mercury	N22-Ma17534	CP	%	85				75-125	Pass	
Nickel	N22-Ma17534	CP	%	94				75-125	Pass	
Zinc	N22-Ma17534	CP	%	98				75-125	Pass	
Spike - % Recovery										
					Result 1					
Total Kjeldahl Nitrogen (as N)	N22-Ma17537	CP	%	97				70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					Result 1	Result 2	RPD			
TRH C6-C9	M22-Ma21014	NCP	mg/L	< 0.02	< 0.02	<1		30%	Pass	

Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	M22-Ma21014	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Toluene	M22-Ma21014	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Ethylbenzene	M22-Ma21014	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
m&p-Xylenes	M22-Ma21014	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass
o-Xylene	M22-Ma21014	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Xylenes - Total*	M22-Ma21014	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	M22-Ma21014	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass
TRH C6-C10	M22-Ma21014	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Acenaphthylene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Anthracene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benz(a)anthracene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(a)pyrene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(b&j)fluoranthene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(g,h,i)perylene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(k)fluoranthene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Chrysene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Dibenz(a,h)anthracene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluoranthene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluorene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Naphthalene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Phenanthrene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Pyrene	M22-Ma18052	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Conductivity (at 25°C)	N22-Ma17526	CP	uS/cm	420	420	<1	30%	Pass
pH (at 25 °C)	N22-Ma17526	CP	pH Units	7.8	7.8	pass	30%	Pass
Phosphate total (as P)	M22-Ma19654	NCP	mg/L	0.68	0.04	3.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Biochemical Oxygen Demand (BOD-5 Day)	N22-Ma17530	CP	mg/L	24	25	3.0	30%	Pass
Total Suspended Solids Dried at 103°C–105°C	N22-Ma17530	CP	mg/L	530	500	5.4	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Ammonia (as N)	N22-Ma17534	CP	mg/L	0.07	0.08	19	30%	Pass
Nitrate & Nitrite (as N)	N22-Ma17534	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium	N22-Ma17534	CP	mg/L	0.41	0.43	4.0	30%	Pass
Arsenic	N22-Ma17534	CP	mg/L	0.003	0.003	5.0	30%	Pass
Cadmium	N22-Ma17534	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium	N22-Ma17534	CP	mg/L	0.001	0.001	3.0	30%	Pass
Copper	N22-Ma17534	CP	mg/L	0.002	0.002	2.0	30%	Pass
Iron	N22-Ma17534	CP	mg/L	2.9	2.5	12	30%	Pass
Lead	N22-Ma17534	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury	N22-Ma17534	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	N22-Ma17534	CP	mg/L	0.008	0.007	3.0	30%	Pass
Zinc	N22-Ma17534	CP	mg/L	0.013	0.014	5.0	30%	Pass

Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C10-C14	N22-Ma17535	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
TRH C15-C28	N22-Ma17535	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass
TRH C29-C36	N22-Ma17535	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
TRH >C10-C16	N22-Ma17535	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
TRH >C16-C34	N22-Ma17535	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass
TRH >C34-C40	N22-Ma17535	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Total Kjeldahl Nitrogen (as N)	N22-Ma17535	CP	mg/L	1.9	2.5	28	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Turbidity	N22-Ma17536	CP	NTU	4.0	3.9	2.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Total Suspended Solids Dried at 103°C–105°C	N22-Ma17537	CP	mg/L	20	19	6.1	30%	Pass

Comments

Thermotolerant coliforms analysed by; Eurofins Food Testing; accreditation number 20293; report reference AR-22-NV-003236-01

Eurofins | Environment Testing accreditation number 1261, site 18217 is currently in progress of a controlled transition to a new custom built location at 179 Magowar Road, Girraween, NSW 2145. All results on this report denoted as being performed by Eurofins | Environment Testing Unit F3, Building F, 16 Mars road, Lane Cove West, NSW 2066, corporate site 18217, will have been performed on either Lane Cove or new Girraween site

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Andrew Black	Analytical Services Manager
Vivian Wang	Senior Analyst-Volatile (VIC)
Charl Du Preez	Senior Analyst-Inorganic (NSW)
Scott Beddoes	Senior Analyst-Inorganic (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Emily Rosenberg	Senior Analyst-Metal (VIC)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

ANALYTICAL REPORT

REPORT CODE
AR-22-NV-003236-01
REPORT DATE
11/03/2022

For the attention of

Eurofins Environment Testing Australia Pty Ltd

Analytical Reports

6 Monterey Road

Dandenong South

3175 Melbourne

AUSTRALIA

Phone +61 3 8564 5064

Email EnviroReportsau@eurofins.com

Contact for your orders:

Ruvini Herath

Order code:

EUAUTWU-00014694

Submission Reference:

 Merged from order
cau001-order-869645-220310.xml

Purchase Order Number:

869645

SAMPLE CODE
726-2022-00008080
Client Reference:

22-Ma17526

Sample described as:

SW1

Reception Date:

10/03/2022

Analysis Starting Date:

10/03/2022

Analysis Ending Date:

11/03/2022

Sampled Date & Time

09/03/2022 12:00:00

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 10/03/2022 17:00

Thermotolerant coliforms	2200	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE
726-2022-00008081
Client Reference:

22-Ma17527

Sample described as:

SW2

Reception Date:

10/03/2022

Analysis Starting Date:

10/03/2022

Analysis Ending Date:

11/03/2022

Sampled Date & Time

09/03/2022 12:00:00

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 10/03/2022 17:00

Thermotolerant coliforms	1400	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE
726-2022-00008082
Client Reference:

22-Ma17528

Sample described as:

SW3

Reception Date:

10/03/2022

Analysis Starting Date:

10/03/2022

Analysis Ending Date:

11/03/2022

Sampled Date & Time

09/03/2022 12:00:00

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 10/03/2022 17:00

Thermotolerant coliforms	1800	cfu/100 ml	1
--------------------------	------	------------	---

Eurofins Food Testing Australia Pty Ltd

 6 Monterey Road
Dandenong South
Melbourne
VIC 3175
AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

 Accredited for compliance with ISO/IEC
17025 - Testing
NATA is a signatory to the ILAC Mutual
Recognition Arrangement for the mutual
recognition of the equivalence of testing,
medical testing, calibration, inspection,
proficiency testing scheme providers and
reference materials producers reports and
certificates.
Accreditation Number 20293


SAMPLE CODE 726-2022-00008083

Client Reference: 22-Ma17529
Sample described as: SW4
Reception Date: 10/03/2022
Analysis Starting Date: 10/03/2022
Sampled Date & Time: 09/03/2022 12:00:00

Analysis Ending Date: 11/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 10/03/2022 17:00

Parameter	Result	Unit	LOQ
Thermotolerant coliforms	12000	cfu/100 ml	1

SAMPLE CODE 726-2022-00008084

Client Reference: 22-Ma17530
Sample described as: SW4A
Reception Date: 10/03/2022
Analysis Starting Date: 10/03/2022
Sampled Date & Time: 09/03/2022 12:00:00

Analysis Ending Date: 11/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 10/03/2022 17:00

Parameter	Result	Unit	LOQ
Thermotolerant coliforms	14000	cfu/100 ml	1

SAMPLE CODE 726-2022-00008085

Client Reference: 22-Ma17531
Sample described as: SW5
Reception Date: 10/03/2022
Analysis Starting Date: 10/03/2022
Sampled Date & Time: 09/03/2022 12:00:00

Analysis Ending Date: 11/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 10/03/2022 17:00

Parameter	Result	Unit	LOQ
Thermotolerant coliforms	700	cfu/100 ml	1

SAMPLE CODE 726-2022-00008086

Client Reference: 22-Ma17532
Sample described as: SW6
Reception Date: 10/03/2022
Analysis Starting Date: 10/03/2022
Sampled Date & Time: 09/03/2022 12:00:00

Analysis Ending Date: 11/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 10/03/2022 17:00

Parameter	Result	Unit	LOQ
Thermotolerant coliforms	2100	cfu/100 ml	1

SAMPLE CODE 726-2022-00008087

Client Reference: 22-Ma17533
Sample described as: SW7
Reception Date: 10/03/2022
Analysis Starting Date: 10/03/2022
Sampled Date & Time: 09/03/2022 12:00:00

Analysis Ending Date: 11/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 10/03/2022 17:00

Thermotolerant coliforms	1300	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE 726-2022-00008088

Client Reference: 22-Ma17534
Sample described as: SW11
Reception Date: 10/03/2022
Analysis Starting Date: 10/03/2022
Sampled Date & Time: 09/03/2022 12:00:00

Analysis Ending Date: 11/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 10/03/2022 17:00

Thermotolerant coliforms	1700	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE 726-2022-00008089

Client Reference: 22-Ma17535
Sample described as: BASIN 1
Reception Date: 10/03/2022
Analysis Starting Date: 10/03/2022
Sampled Date & Time: 09/03/2022 12:00:00

Analysis Ending Date: 11/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 10/03/2022 17:00

Thermotolerant coliforms	1700	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE 726-2022-00008090

Client Reference: 22-Ma17536
Sample described as: BASIN 2
Reception Date: 10/03/2022
Analysis Starting Date: 10/03/2022
Sampled Date & Time: 09/03/2022 12:00:00

Analysis Ending Date: 11/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 10/03/2022 17:00

Thermotolerant coliforms	2300	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE 726-2022-00008091

Client Reference: 22-Ma17537
Sample described as: BASIN 3
Reception Date: 10/03/2022
Analysis Starting Date: 10/03/2022
Sampled Date & Time: 09/03/2022 12:00:00

Analysis Ending Date: 11/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 10/03/2022 17:00

Parameter	Result	Unit	LOQ
Thermotolerant coliforms	1100	cfu/100 ml	1

LIST OF METHODS

 VQ792 **Thermotolerant Coliforms:** AS 4276.7

Signature
Di Shen Scientist

EXPLANATORY NOTE

- ◆ test is not accredited
- test is subcontracted within Eurofins group and is accredited
- test is subcontracted within Eurofins group and is not accredited
- test is subcontracted outside Eurofins group and is accredited
- test is subcontracted outside Eurofins group and is not accredited

N/A means Not applicable

Not Detected means not detected at or above the Limit of Quantification (LOQ)

LOQ Limit of Quantification

U Measurement Uncertainty

< Less than, ≤ Less than or equal to

> Greater than, ≥ Greater than or equal to

The tests are identified by a 5 digit code, full details can be provided on request.

Information supplied by the client. This information can have an impact on the validity of results.

Samples are tested as received and the results relate only to the sample tested.

Analysis date is reported as the start date of extraction for a method.

The results may not be reproduced except in full, without a written approval from the laboratory.

Eurofins General Terms and Conditions apply.

END OF REPORT
Eurofins Food Testing Australia Pty Ltd

 6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

Accredited for compliance with ISO/IEC 17025 - Testing

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Accreditation Number 20293



CHAIN OF CUSTODY RECORD

CLIENT DETAILS		Page _____ of _____	
Company Name: GHD	Contact Name: Lachlan Parkinson	Purchase Order: 12552139	CQC Number:
Office Address: L3, 24 Honeysuckle Drive Newcastle 2300	Project Manager: Alyssa Barron / Michael Swinfield	PROJECT Number: 12552139	Eurofins | mgt quote ID: 180501GHD
	Email for results: Alyssa.Barron@ghd.com Lachlan.Parkinson@ghd.com Michael.Swinfield@ghd.com	PROJECT Name: Aurizon Hexham Water Monitoring	Data output format: ESDAT

Please ensure fecal coliforms are reported in CFU/100ml

Special Directions & Comments:				Analytes										Some common holding times (with correct preservation). For further information contact the lab							
Sample ID	Date	Matrix		B4 (BTEXN / TRH / PAH)	Total Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	Sulfate B19A (Nutrients, Total N (TKN, NOX), Total P	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day	Waters				Soils						
1	9/3/22	W		X	X	X	X	X	X	X	BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days							
2		W		X	X	X	X	X	X	X	TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days							
3		W		X	X	X	X	X	X	X	Heavy Metals	6 months	Heavy Metals	6 months							
4		W		X	X	X	X	X	X	X	Mercury, CrVI	28 days	Mercury, CrVI	28 days							
5		W		X	X	X	X	X	X	X	Microbiological testing	24 hours	Microbiological testing	72 hours							
6		W		X	X	X	X	X	X	X	BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days							
7		W		X	X	X	X	X	X	X	Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours							
8		W		X	X	X	X	X	X	X	Ferrous iron	7 days	ASLP, TCLP	7 days							
9		W		X	X	X	X	X	X	X	Containers: 8 1LP 250P 125P 1LA 40mL wa 125mL A Jar										
10		W		X	X	X	X	X	X	X											
11		W		X	X	X	X	X	X	X											
12		W		X	X	X	X	X	X	X											
13		W		X	X	X	X	X	X	X											
14		W		X	X	X	X	X	X	X											
16		W		X	X	X	X	X	X	X											
16		W		X	X	X	X	X	X	X											
17		W		X	X	X	X	X	X	X											
18		W		X	X	X	X	X	X	X											
19		W		X	X	X	X	X	X	X											
20		W		X	X	X	X	X	X	X											

Relinquished By: L Parkinson	Laboratory Staff	Turn around time	Method Of Shipment	Temperature on arrival:
Date & Time: 9/3/22	Received By: AK	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>	<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal Courier Consignment #:	11.3
Signature: [Signature]	Date & Time: 9.3.22 1:30am	5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:		Report number: 869645

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **Lachlan Parkinson**

Report **874983-W**
Project name **AURIZON HEXHAM WATER MONITORING**
Project ID **12552139**
Received Date **Mar 28, 2022**

Client Sample ID			MW01R Water M22-Ma57973 Mar 24, 2022	101R Water M22-Ma57974 Mar 24, 2022	MW106R Water M22-Ma57975 Mar 24, 2022	MW301R Water M22-Ma57976 Mar 24, 2022
Sample Matrix	LOR	Unit				
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	124	113	117	112
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			MW01R	101R	MW106R	MW301R
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22-Ma57973	M22-Ma57974	M22-Ma57975	M22-Ma57976
Date Sampled			Mar 24, 2022	Mar 24, 2022	Mar 24, 2022	Mar 24, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	138	55	128	82
p-Terphenyl-d14 (surr.)	1	%	82	112	91	102
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	0.70	3.1	0.16	0.58
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	17	< 5	< 5	< 5
Conductivity (at 25°C)						
Conductivity (at 25°C)	10	uS/cm	9000	9400	1100	6000
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	0.15	< 0.05	0.07	< 0.05
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	6.4	6.9	7.5	7.3
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.15	0.16	0.26	2.0
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	1.7	6.1	0.4	1.2
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	1.85	6.1	0.47	1.2
Total Suspended Solids Dried at 103°C–105°C						
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	220	370	23	53
Turbidity						
Turbidity	1	NTU	360	550	18	93
Heavy Metals						
Aluminium (filtered)						
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)						
Arsenic (filtered)	0.001	mg/L	0.002	0.002	< 0.001	0.002
Cadmium (filtered)						
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)						
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)						
Copper (filtered)	0.001	mg/L	< 0.001	0.002	0.002	< 0.001
Iron (filtered)						
Iron (filtered)	0.05	mg/L	120	37	1.1	6.7
Lead (filtered)						
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)						
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)						
Nickel (filtered)	0.001	mg/L	0.019	0.017	0.004	0.004
Zinc (filtered)						
Zinc (filtered)	0.005	mg/L	< 0.005	0.016	0.010	< 0.005
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			MW02	MW302R	FD01	RB01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22-Ma57977	M22-Ma57978	M22-Ma57979	M22-Ma57980
Date Sampled			Mar 24, 2022	Mar 24, 2022	Mar 24, 2022	Mar 24, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene^{N02}						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10						
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)^{N04}						
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)^{N01}						
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34						
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			MW02	MW302R	FD01	RB01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22-Ma57977	M22-Ma57978	M22-Ma57979	M22-Ma57980
Date Sampled			Mar 24, 2022	Mar 24, 2022	Mar 24, 2022	Mar 24, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	116	118	120	116
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	136	63	62	54
p-Terphenyl-d14 (surr.)	1	%	58	118	122	69
Water Quality Parameters						
Ammonia (as N)	0.01	mg/L	^{R09} 2.1	^{R09} 0.22	-	-
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	5.1	< 5	-	-
Conductivity (at 25°C)	10	uS/cm	2500	370	-	-
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	0.07	0.07	< 0.05
pH (at 25 °C)	0.1	pH Units	3.6	7.3	-	-
Phosphate total (as P)	0.01	mg/L	0.55	0.40	0.40	0.01
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	^{R09} 1.5	^{R09} < 0.2	0.4	0.7
Total Nitrogen (as N)*	0.2	mg/L	1.5	< 0.2	0.47	0.7
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	6.2	45	-	-
Turbidity	1	NTU	5.1	23	-	-
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	0.015	< 0.001	< 0.001	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.010	0.004	0.003	< 0.001
Iron (filtered)	0.05	mg/L	82	3.6	3.7	< 0.05
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			MW02	MW302R	FD01	RB01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22-Ma57977	M22-Ma57978	M22-Ma57979	M22-Ma57980
Date Sampled			Mar 24, 2022	Mar 24, 2022	Mar 24, 2022	Mar 24, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.066	0.004	0.004	< 0.001
Zinc (filtered)	0.005	mg/L	0.10	0.024	0.021	< 0.005
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	-	-

Client Sample ID			BASIN 2
Sample Matrix			Water
Eurofins Sample No.			M22-Ma57981
Date Sampled			Mar 24, 2022
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	121
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001

Client Sample ID			BASIN 2
Sample Matrix			Water
Eurofins Sample No.			M22-Ma57981
Date Sampled			Mar 24, 2022
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	86
p-Terphenyl-d14 (surr.)	1	%	75
Ammonia (as N)			
	0.01	mg/L	0.29
Biochemical Oxygen Demand (BOD-5 Day)			
	5	mg/L	< 5
Conductivity (at 25°C)			
	10	uS/cm	1300
Nitrate & Nitrite (as N)			
	0.05	mg/L	0.21
pH (at 25 °C)			
	0.1	pH Units	7.7
Phosphate total (as P)			
	0.01	mg/L	1.5
Total Kjeldahl Nitrogen (as N)			
	0.2	mg/L	1.9
Total Nitrogen (as N)*			
	0.2	mg/L	2.11
Total Suspended Solids Dried at 103°C–105°C			
	5	mg/L	8.9
Turbidity			
	1	NTU	2.1
Heavy Metals			
Aluminium	0.05	mg/L	< 0.05
Arsenic	0.001	mg/L	0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Copper	0.001	mg/L	< 0.001
Iron	0.05	mg/L	0.13
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	0.004
Zinc	0.005	mg/L	0.018
Pathogens			
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Mar 31, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Mar 31, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Mar 31, 2022	7 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Melbourne	Mar 31, 2022	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Mar 31, 2022	7 Days
Ammonia (as N) - Method: APHA 4500-NH3 Ammonia Nitrogen by FIA	Melbourne	Mar 31, 2022	28 Days
Biochemical Oxygen Demand (BOD-5 Day) - Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water	Melbourne	Mar 31, 2022	2 Days
Conductivity (at 25°C) - Method: LTM-INO-4030 Conductivity	Melbourne	Mar 31, 2022	28 Days
pH (at 25 °C) - Method: LTM-GEN-7090 pH in water by ISE	Melbourne	Mar 31, 2022	0 Hours
Total Suspended Solids Dried at 103°C–105°C - Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry	Melbourne	Mar 31, 2022	7 Days
Turbidity - Method: Turbidity by classical using APHA 2130B (LTM-INO-4140)	Melbourne	Mar 31, 2022	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Mar 31, 2022	28 Days
Heavy Metals (filtered) - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Mar 31, 2022	180 Days
Mobil Metals : Metals M15 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Mar 31, 2022	28 Days
Thermotolerant Coliforms (CFU) - Method: LTM-MIC-6607 Microbes by Membrane Filtration AS/NZS 4276.7:2007	WaterTestingVic	Mar 29, 2022	24 Hours
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N) - Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA	Melbourne	Mar 31, 2022	28 Days
Total Kjeldahl Nitrogen (as N) - Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA	Melbourne	Mar 31, 2022	28 Days
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphate total (as P) - Method: LTM-INO-4040 Phosphate by CFA	Melbourne	Apr 01, 2022	28 Days

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.: 12552139
Report #: 874983
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Mar 28, 2022 3:00 PM
Due: Apr 4, 2022
Priority: 5 Day
Contact Name: Lachlan Parkinson

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12552139

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Aluminium (filtered)	Ammonia (as N)	Arsenic	Arsenic (filtered)	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Cadmium (filtered)	Chromium	Chromium (filtered)	Conductivity (at 25°C)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103°C-105°C	Turbidity	Zinc	Zinc (filtered)	Eurofins Suite B4	Total P	Eurofins Suite B19A: Total N (TKN, NOx)						
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Sydney Laboratory - NATA # 1261 Site # 18217																																									
Brisbane Laboratory - NATA # 1261 Site # 20794																																									
Mayfield Laboratory - NATA # 1261 Site # 25079																																									
Perth Laboratory - NATA # 2377 Site # 2370																																									
External Laboratory																												X													
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																																				
1	MW01R	Mar 24, 2022		Water	M22-Ma57973	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X	X	X	X				
2	101R	Mar 24, 2022		Water	M22-Ma57974	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X			
3	MW106R	Mar 24, 2022		Water	M22-Ma57975	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X			
4	MW301R	Mar 24, 2022		Water	M22-Ma57976	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X			
5	MW02	Mar 24, 2022		Water	M22-Ma57977	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X			
6	MW302R	Mar 24, 2022		Water	M22-Ma57978	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X			
7	FD01	Mar 24, 2022		Water	M22-Ma57979	X			X			X		X				X		X		X		X		X									X	X	X	X			
8	RB01	Mar 24, 2022		Water	M22-Ma57980		X		X			X		X				X		X		X		X		X									X	X	X	X			
9	BASIN 2	Mar 24, 2022		Water	M22-Ma57981	X		X	X		X	X		X		X	X		X		X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X			

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.: 12552139
Report #: 874983
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Mar 28, 2022 3:00 PM
Due: Apr 4, 2022
Priority: 5 Day
Contact Name: Lachlan Parkinson

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12552139

Eurofins Analytical Services Manager : Andrew Black

Sample Detail	Aluminium	Aluminium (filtered)	Ammonia (as N)	Arsenic	Arsenic (filtered)	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Cadmium (filtered)	Chromium	Chromium (filtered)	Conductivity (at 25°C)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103°C-105°C	Turbidity	Zinc	Zinc (filtered)	Eurofins Suite B4	Total P	Eurofins Suite B19A: Total N (TKN, NOx)
Melbourne Laboratory - NATA # 1261 Site # 1254	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																														
Brisbane Laboratory - NATA # 1261 Site # 20794																														
Mayfield Laboratory - NATA # 1261 Site # 25079																														
Perth Laboratory - NATA # 2377 Site # 2370																														
External Laboratory																						X								
Test Counts	1	8	7	1	8	7	1	8	1	8	7	1	8	1	8	1	8	1	8	1	8	7	7	7	7	1	8	9	9	

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank						
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	mg/L	< 0.001		0.001	Pass	
Acenaphthylene	mg/L	< 0.001		0.001	Pass	
Anthracene	mg/L	< 0.001		0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001		0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001		0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001		0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001		0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001		0.001	Pass	
Chrysene	mg/L	< 0.001		0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001		0.001	Pass	
Fluoranthene	mg/L	< 0.001		0.001	Pass	
Fluorene	mg/L	< 0.001		0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001		0.001	Pass	
Naphthalene	mg/L	< 0.001		0.001	Pass	
Phenanthrene	mg/L	< 0.001		0.001	Pass	
Pyrene	mg/L	< 0.001		0.001	Pass	
Method Blank						
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2		0.2	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons						
TRH C6-C9	%	108		70-130	Pass	
Naphthalene	%	90		70-130	Pass	
TRH C6-C10	%	106		70-130	Pass	
LCS - % Recovery						
BTEX						
Benzene	%	109		70-130	Pass	
Toluene	%	105		70-130	Pass	
Ethylbenzene	%	120		70-130	Pass	
m&p-Xylenes	%	121		70-130	Pass	
Xylenes - Total*	%	121		70-130	Pass	
LCS - % Recovery						
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	%	89		70-130	Pass	
Acenaphthylene	%	126		70-130	Pass	
Anthracene	%	95		70-130	Pass	
Benz(a)anthracene	%	111		70-130	Pass	
Benzo(a)pyrene	%	79		70-130	Pass	
Benzo(b&j)fluoranthene	%	102		70-130	Pass	
Benzo(g,h,i)perylene	%	86		70-130	Pass	
Benzo(k)fluoranthene	%	115		70-130	Pass	
Chrysene	%	108		70-130	Pass	
Dibenz(a,h)anthracene	%	75		70-130	Pass	
Fluoranthene	%	100		70-130	Pass	
Fluorene	%	117		70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	77		70-130	Pass	
Naphthalene	%	73		70-130	Pass	
Phenanthrene	%	72		70-130	Pass	
Pyrene	%	101		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Total Kjeldahl Nitrogen (as N)	M22-Ma63606	NCP	%	121			70-130	Pass	
Total Suspended Solids Dried at 103°C–105°C	M22-Ma63513	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M22-Ma57974	CP	%	98			70-130	Pass	
Acenaphthylene	M22-Ma57974	CP	%	95			70-130	Pass	
Anthracene	M22-Ma57974	CP	%	79			70-130	Pass	
Benz(a)anthracene	M22-Ma57974	CP	%	91			70-130	Pass	
Benzo(a)pyrene	M22-Ma57974	CP	%	92			70-130	Pass	
Benzo(b&j)fluoranthene	M22-Ma57974	CP	%	117			70-130	Pass	
Benzo(g,h,i)perylene	M22-Ma57974	CP	%	123			70-130	Pass	
Benzo(k)fluoranthene	M22-Ma57974	CP	%	90			70-130	Pass	
Chrysene	M22-Ma57974	CP	%	106			70-130	Pass	
Dibenz(a,h)anthracene	M22-Ma57974	CP	%	95			70-130	Pass	
Fluoranthene	M22-Ma57974	CP	%	107			70-130	Pass	
Fluorene	M22-Ma57974	CP	%	84			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M22-Ma57974	CP	%	75			70-130	Pass	
Naphthalene	M22-Ma57974	CP	%	71			70-130	Pass	
Phenanthrene	M22-Ma57974	CP	%	90			70-130	Pass	
Pyrene	M22-Ma57974	CP	%	107			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	M22-Ma57981	CP	%	107			70-130	Pass	
Naphthalene	M22-Ma57981	CP	%	87			70-130	Pass	
TRH C6-C10	M22-Ma57981	CP	%	103			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M22-Ma57981	CP	%	106			70-130	Pass	
Toluene	M22-Ma57981	CP	%	105			70-130	Pass	
Ethylbenzene	M22-Ma57981	CP	%	118			70-130	Pass	
m&p-Xylenes	M22-Ma57981	CP	%	112			70-130	Pass	
o-Xylene	M22-Ma57981	CP	%	111			70-130	Pass	
Xylenes - Total*	M22-Ma57981	CP	%	111			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	M22-Ma57973	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Naphthalene	M22-Ma57973	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M22-Ma57973	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M22-Ma57973	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M22-Ma57973	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M22-Ma57973	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M22-Ma57973	CP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M22-Ma57973	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	M22-Ma57973	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	S22-Ma63547	NCP	mg/L	0.12	0.12	1.0	30%	Pass	
Nitrate & Nitrite (as N)	S22-Ma63547	NCP	mg/L	0.19	0.18	4.0	30%	Pass	
Phosphate total (as P)	B22-Ma58208	NCP	mg/L	2.8	2.8	<1	30%	Pass	
Total Suspended Solids Dried at 103°C–105°C	M22-Ma63821	NCP	mg/L	18	17	10	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium (filtered)	M22-Ma63823	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Arsenic (filtered)	M22-Ma63823	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	M22-Ma63823	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	M22-Ma63823	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	M22-Ma63823	NCP	mg/L	0.006	0.006	<1	30%	Pass	
Iron (filtered)	M22-Ma63823	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Lead (filtered)	M22-Ma63823	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	M22-Ma63823	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	M22-Ma63823	NCP	mg/L	0.006	0.006	1.0	30%	Pass	
Zinc (filtered)	M22-Ma63823	NCP	mg/L	0.007	0.007	2.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C10-C14	M22-Ma57975	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M22-Ma57975	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M22-Ma57975	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C10-C16	M22-Ma57975	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M22-Ma57975	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M22-Ma57975	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g,h,i)perylene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a,h)anthracene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M22-Ma57975	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (at 25°C)	M22-Ma57976	CP	uS/cm	6000	5300	11	30%	Pass	
pH (at 25 °C)	M22-Ma57976	CP	pH Units	7.3	7.3	pass	30%	Pass	
Total Kjeldahl Nitrogen (as N)	M22-Ma57976	CP	mg/L	1.2	1.3	5.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Biochemical Oxygen Demand (BOD-5 Day)	M22-Ma57978	CP	mg/L	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Turbidity	M22-Ma57981	CP	NTU	2.1	1.3	47	30%	Fail	Q15

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium	M22-Ma63717	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Arsenic	M22-Ma63717	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Cadmium	M22-Ma63717	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium	M22-Ma63717	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper	M22-Ma63717	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Iron	M22-Ma63717	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Lead	M22-Ma63717	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury	M22-Ma63717	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	M22-Ma63717	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Zinc	M22-Ma63717	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass

Comments

Thermotolerant coliforms analysed by; Eurofins Food Testing; accreditation number 20293; report reference; AR-22-NV-003945-01

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	N/A
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
R09	Theoretically the TKN result should be greater or equal to the ammonia concentration. However the difference reported is within the measurement uncertainty of the individual tests

Authorised by:

Andrew Black	Analytical Services Manager
Vivian Wang	Senior Analyst (VIC)
Mary Makarios	Senior Analyst (NSW)
Joseph Edouard	Senior Analyst (VIC)
Caitlin Breeze	Senior Analyst (VIC)
Edward Lee	Senior Analyst (VIC)
Scott Beddoes	Senior Analyst (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

ANALYTICAL REPORT

REPORT CODE
AR-22-NV-003945-01
REPORT DATE
30/03/2022

For the attention of

Eurofins Environment Testing Australia Pty Ltd

Analytical Reports

6 Monterey Road

Dandenong South

3175 Melbourne

AUSTRALIA

Phone +61 3 8564 5064

Email EnviroReportsau@eurofins.com

Contact for your orders:

Ruvini Herath

Order code:

EUAUTWU-00015373

Submission Reference:

 Merged from order
cau001-order-874983-220329.xml

Purchase Order Number:

874983

SAMPLE CODE
726-2022-00011131
Client Reference:

22-Ma57973

Sample described as:

MW01R

Reception Date:

28/03/2022

Analysis Starting Date:

29/03/2022

Sampled Date & Time

24/03/2022 12:00:00

Reception temperature:

2.9 °C

Analysis Ending Date:

30/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 30/03/2022 11:02

Thermotolerant coliforms	<10	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE
726-2022-00011132
Client Reference:

22-Ma57974

Sample described as:

101R

Reception Date:

28/03/2022

Analysis Starting Date:

30/03/2022

Sampled Date & Time

24/03/2022 12:00:00

Reception temperature:

2.9 °C

Analysis Ending Date:

30/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 30/03/2022 11:02

Thermotolerant coliforms	<10	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE
726-2022-00011133
Client Reference:

22-Ma57975

Sample described as:

MW106R

Reception Date:

28/03/2022

Analysis Starting Date:

30/03/2022

Sampled Date & Time

24/03/2022 12:00:00

Reception temperature:

2.9 °C

Analysis Ending Date:

30/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 30/03/2022 11:02

Thermotolerant coliforms	220	cfu/100 ml	1
--------------------------	-----	------------	---

Eurofins Food Testing Australia Pty Ltd

 6 Monterey Road
Dandenong South
Melbourne
VIC 3175
AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

Accredited for compliance with ISO/IEC 17025 - Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
Accreditation Number 20293



SAMPLE CODE 726-2022-00011134

Client Reference: 22-Ma57976
Sample described as: MW301R
Reception Date: 28/03/2022
Analysis Starting Date: 30/03/2022
Sampled Date & Time: 24/03/2022 12:00:00

Reception temperature: 2.9 °C
Analysis Ending Date: 30/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 30/03/2022 11:02

Thermotolerant coliforms	50	cfu/100 ml	1
--------------------------	----	------------	---

SAMPLE CODE 726-2022-00011135

Client Reference: 22-Ma57977
Sample described as: MW02
Reception Date: 28/03/2022
Analysis Starting Date: 30/03/2022
Sampled Date & Time: 24/03/2022 12:00:00

Reception temperature: 2.9 °C
Analysis Ending Date: 30/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 30/03/2022 11:02

Thermotolerant coliforms	<10	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE 726-2022-00011136

Client Reference: 22-Ma57978
Sample described as: MW302R
Reception Date: 28/03/2022
Analysis Starting Date: 30/03/2022
Sampled Date & Time: 24/03/2022 12:00:00

Reception temperature: 2.9 °C
Analysis Ending Date: 30/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 30/03/2022 11:02

Thermotolerant coliforms	4900	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE 726-2022-00011137

Client Reference: 22-Ma57981
Sample described as: BASIN 2
Reception Date: 28/03/2022
Analysis Starting Date: 30/03/2022
Sampled Date & Time: 24/03/2022 12:00:00

Reception temperature: 2.9 °C
Analysis Ending Date: 30/03/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 30/03/2022 11:02

Thermotolerant coliforms	7700	cfu/100 ml	1
--------------------------	------	------------	---

LIST OF METHODS

VQ792 Thermotolerant Coliforms: AS 4276.7

Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

Accredited for compliance with ISO/IEC 17025 - Testing
 NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
 Accreditation Number 20293



Signature



Di Shen Scientist

EXPLANATORY NOTE

- ◆ test is not accredited
- test is subcontracted within Eurofins group and is accredited
- test is subcontracted within Eurofins group and is not accredited
- test is subcontracted outside Eurofins group and is accredited
- test is subcontracted outside Eurofins group and is not accredited

N/A means Not applicable

Not Detected means not detected at or above the Limit of Quantification (LOQ)

LOQ Limit of Quantification

U Measurement Uncertainty

< Less than, ≤ Less than or equal to

> Greater than, ≥ Greater than or equal to

The tests are identified by a 5 digit code, full details can be provided on request.

Information supplied by the client. This information can have an impact on the validity of results.

Samples are tested as received and the results relate only to the sample tested.

Analysis date is reported as the start date of extraction for a method.

The results may not be reproduced except in full, without a written approval from the laboratory.

Eurofins General Terms and Conditions apply.

END OF REPORT

Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

Accredited for compliance with ISO/IEC 17025 - Testing
 NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
 Accreditation Number 20293



CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name: GHD	Contact Name: Lachlan Parkinson	Purchase Order: 12552139	Page 1 of 1
Office Address: L3, 24 Honeysuckle Drive	Project Manager: Leslie Maranciak	PROJECT Number: 12552139	COC Number:
Newcastle 2300	Email for results: Lachlan.Parkinson@ghd.com Leslie.Maranciak@ghd.com	PROJECT Name: Aurizon Hexham Water Monitoring	Eurofins | mgt quota ID: 180501GHD
			Data output format: ESDAT

Special Directions & Comments:
Please ensure fecal coliforms are reported in CFU/100ml

Sample ID	Date	Matrix	B4 (BTEXN / TRH / PAH)	Dissolved Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	Some B19A (Nutrients, Total N (TKN, NOX), Total P)	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day	Total Metals (Pb, As, Cr, Ni, Cu, Zn)	Send to ALS - same analysis as FDD1 at ALS please
1	MW01R	W	X	X	X	X	X	X	X		
2	101R	W	X	X	X	X	X	X	X		
3	MW101R	W	X	X	X	X	X	X	X		
4	MW106R	W	X	X	X	X	X	X	X		
5	MW108R	W	X	X	X	X	X	X	X		
6	MW409	W	X	X	X	X	X	X	X		
7	MW301R	W	X	X	X	X	X	X	X		
8	MW02	W	X	X	X	X	X	X	X		
9	MW307R	W	X	X	X	X	X	X	X		
10	MW306R	W	X	X	X	X	X	X	X		
11	MW302R	W	X	X	X	X	X	X	X		
12	FDD1	W	X	X			X				
13	FDD1	W									X
14	RB01	W	X	X			X				
15	<i>Basin 2</i>		X	X	X	X	X	X	X		
16	<i>Basin</i>		X	X	X	X	X	X	X		
17											

Some common holding times (with correct preservation). For further information contact the lab			
Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Eurofins | mgt DI water batch number:

Containers:							Sample comments:
1LP	250P	125P	1LA	40mL Vial	125mL A	Jar	

Relinquished By: <i>L Parkinson</i>	Laboratory Staff	Turn around time	Method Of Shipment	Temperature on arrival:
Date & Time: <i>24/3/22</i>	Received By: <i>AR</i>	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>	<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal	<i>12.2</i>
Signature: <i>AR</i>	Date & Time: <i>24-3-22 3pm</i>	5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:	Courier Consignment # :	Report number:
	Signature: <i>AR</i>			

R 874983
28/3/22
TY

#AU_CAU001_EnviroSampleVic

From: Leslie Maranciak <Leslie.Maranciak@ghd.com>
Sent: Monday, 28 March 2022 4:25 PM
To: #AU_CAU001_EnviroSampleVic; Lachlan Parkinson
Subject: RE: Eurofins Sample Receipt Advice - Report 874983 : Site AURIZON HEXHAM WATER MONITORING (12552139)

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Tyrone-

Can you please update sampling date to be 24 March (2022) for all samples?

Thanks,
Leslie

874983
G/L EF
28/3/22

From: EnviroSampleVic@eurofins.com <EnviroSampleVic@eurofins.com>
Sent: Monday, 28 March 2022 3:54 PM
To: Lachlan Parkinson <lachlan.parkinson@ghd.com>
Cc: Leslie Maranciak <leslie.maranciak@ghd.com>
Subject: Eurofins Sample Receipt Advice - Report 874983 : Site AURIZON HEXHAM WATER MONITORING (12552139)

Dear Valued Client,

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Tyrone Gowans
Sample Receipt

Eurofins Environment Testing
6 Monterey Road Dandenong South VIC 3175
AUSTRALIA
Phone: 03 8564 5043
Email: Envirosamplevic@eurofins.com
Website: environment.eurofins.com.au

[View our latest EnviroNotes](#)
[How did we do? Provide your feedback here](#)

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: Alyssa Barron

Report **875298-W**
Project name **AURIZON**
Project ID **12552139**
Received Date **Mar 29, 2022**

Client Sample ID			SW1 Water N22-Ma60699 Mar 29, 2022	SW2 Water N22-Ma60700 Mar 29, 2022	SW3 Water N22-Ma60701 Mar 29, 2022	SW4 Water N22-Ma60702 Mar 29, 2022
Sample Matrix	LOR	Unit				
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	87	87	86	90
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			SW1 Water N22-Ma60699 Mar 29, 2022	SW2 Water N22-Ma60700 Mar 29, 2022	SW3 Water N22-Ma60701 Mar 29, 2022	SW4 Water N22-Ma60702 Mar 29, 2022
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	81	83	67	54
p-Terphenyl-d14 (surr.)	1	%	81	83	70	57
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	0.2	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	0.2	< 0.1	< 0.1
Water Quality Parameters						
Ammonia (as N)	0.01	mg/L	0.09	0.07	0.27	0.47
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	< 5	8.1	< 5
Conductivity (at 25°C)	10	uS/cm	450	440	1600	2000
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
pH (at 25 °C)	0.1	pH Units	7.8	7.8	7.7	8.0
Phosphate total (as P)	0.01	mg/L	0.91	0.79	16	6.3
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	2.3	4.3	4.0	12
Total Nitrogen (as N)*	0.2	mg/L	2.3	4.3	4	12
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	< 5	15	5.9	150
Turbidity	1	NTU	3.9	6.6	5.5	250
Heavy Metals						
Aluminium	0.05	mg/L	0.87	0.07	0.11	0.41
Arsenic	0.001	mg/L	0.001	0.002	0.002	0.013
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	< 0.001	0.003	0.004
Iron	0.05	mg/L	2.8	3.1	1.7	100
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.002
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.002	0.002	0.005	0.007
Zinc	0.005	mg/L	0.005	< 0.005	0.010	0.026
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			SW4A Water N22-Ma60703 Mar 29, 2022	SW5 Water N22-Ma60704 Mar 29, 2022	SW6 Water N22-Ma60705 Mar 29, 2022	SW7 Water N22-Ma60706 Mar 29, 2022
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			SW4A	SW5	SW6	SW7
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			N22-Ma60703	N22-Ma60704	N22-Ma60705	N22-Ma60706
Date Sampled			Mar 29, 2022	Mar 29, 2022	Mar 29, 2022	Mar 29, 2022
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	90	88	87	90
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	55	58	68	76
p-Terphenyl-d14 (surr.)	1	%	71	71	69	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Water Quality Parameters						
Ammonia (as N)	0.01	mg/L	0.02	0.34	0.02	0.04
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	15	21	< 5	< 5
Conductivity (at 25°C)	10	uS/cm	2200	1500	990	1400
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	0.06	< 0.05	0.09
pH (at 25 °C)	0.1	pH Units	8.2	7.6	7.8	3.8
Phosphate total (as P)	0.01	mg/L	2.5	2.6	0.25	0.58
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	1.8	2.0	0.7	0.3
Total Nitrogen (as N)*	0.2	mg/L	1.8	2.06	0.7	0.39
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	13	40	< 5	< 5
Turbidity	1	NTU	8.5	99	15	60

Client Sample ID			SW4A Water N22-Ma60703 Mar 29, 2022	SW5 Water N22-Ma60704 Mar 29, 2022	SW6 Water N22-Ma60705 Mar 29, 2022	SW7 Water N22-Ma60706 Mar 29, 2022
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	0.08	0.11	< 0.05	0.88
Arsenic	0.001	mg/L	0.002	0.010	< 0.001	0.002
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	0.0004
Chromium	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.001
Iron	0.05	mg/L	4.3	45	4.4	43
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.006	0.029	0.004	0.063
Zinc	0.005	mg/L	0.009	0.011	0.005	0.27
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			SW8 Water N22-Ma60707 Mar 29, 2022	SW9 Water N22-Ma60708 Mar 29, 2022	SW11 Water N22-Ma60709 Mar 29, 2022	BASIN 1 Water N22-Ma60710 Mar 29, 2022
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	58	54	106	103
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			SW8	SW9	SW11	BASIN 1
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			N22-Ma60707	N22-Ma60708	N22-Ma60709	N22-Ma60710
Date Sampled			Mar 29, 2022	Mar 29, 2022	Mar 29, 2022	Mar 29, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	81	58	67	89
p-Terphenyl-d14 (surr.)	1	%	82	67	69	96
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	0.16	0.36	0.15	0.23
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	< 5	< 5	< 5
Conductivity (at 25°C)						
Conductivity (at 25°C)	10	uS/cm	960	2600	460	250
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	0.28	0.19	< 0.05	< 0.05
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	8.1	8.2	7.6	8.0
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.38	0.52	0.75	0.51
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	0.8	1.1	1.1	1.6
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	1.08	1.29	1.1	1.6
Total Suspended Solids Dried at 103°C–105°C						
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	5.6	7.6	16	< 5
Turbidity						
Turbidity	1	NTU	40	12	10	2.1
Heavy Metals						
Aluminium	0.05	mg/L	2.2	0.43	0.07	< 0.05
Arsenic	0.001	mg/L	0.002	0.002	0.002	0.003
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	0.003	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	0.004	0.003	< 0.001	0.001
Iron	0.05	mg/L	4.1	1.3	2.5	0.19
Lead	0.001	mg/L	0.002	< 0.001	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.007	0.002	0.002	< 0.001
Zinc	0.005	mg/L	0.032	0.005	0.007	0.006
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			BASIN 2	BASIN 3
Sample Matrix			Water	Water
Eurofins Sample No.			N22-Ma60711	N22-Ma60712
Date Sampled			Mar 29, 2022	Mar 29, 2022
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1
BTEX				
Benzene	0.001	mg/L	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	91	99
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	0.001	mg/L	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	92	76
p-Terphenyl-d14 (surr.)	1	%	106	84
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1
Ammonia (as N)				
Ammonia (as N)	0.01	mg/L	0.14	0.14
Biochemical Oxygen Demand (BOD-5 Day)				
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	5.3
Conductivity (at 25°C)				
Conductivity (at 25°C)	10	uS/cm	< 10	< 10
Nitrate & Nitrite (as N)				
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05
pH (at 25 °C)				
pH (at 25 °C)	0.1	pH Units	8.0	7.5

Client Sample ID			BASIN 2	BASIN 3
Sample Matrix			Water	Water
Eurofins Sample No.			N22-Ma60711	N22-Ma60712
Date Sampled			Mar 29, 2022	Mar 29, 2022
Test/Reference	LOR	Unit		
Phosphate total (as P)	0.01	mg/L	0.66	1.7
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	4.9	< 0.2
Total Nitrogen (as N)*	0.2	mg/L	4.9	< 0.2
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	10	74
Turbidity	1	NTU	3.6	21
Heavy Metals				
Aluminium	0.05	mg/L	0.07	0.12
Arsenic	0.001	mg/L	< 0.001	0.002
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001
Copper	0.001	mg/L	0.001	0.003
Iron	0.05	mg/L	0.76	5.8
Lead	0.001	mg/L	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.005	0.005
Zinc	0.005	mg/L	0.008	0.019
Pathogens				
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B7			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 07, 2022	7 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Melbourne	Apr 04, 2022	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 04, 2022	7 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Apr 04, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 07, 2022	7 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Apr 04, 2022	28 Days
Ammonia (as N) - Method: APHA 4500-NH3 Ammonia Nitrogen by FIA	Melbourne	Apr 04, 2022	28 Days
Biochemical Oxygen Demand (BOD-5 Day) - Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water	Melbourne	Apr 04, 2022	2 Days
Conductivity (at 25°C) - Method: LTM-INO-4030 Conductivity	Melbourne	Apr 04, 2022	28 Days
pH (at 25 °C) - Method: LTM-GEN-7090 pH in water by ISE	Melbourne	Apr 04, 2022	0 Hours
Total Suspended Solids Dried at 103°C–105°C - Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry	Melbourne	Apr 04, 2022	7 Days
Turbidity - Method: Turbidity by classical using APHA 2130B (LTM-INO-4140)	Melbourne	Apr 04, 2022	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Apr 04, 2022	28 Days
Thermotolerant Coliforms (CFU) - Method: LTM-MIC-6607 Microbes by Membrane Filtration AS/NZS 4276.7:2007	WaterTestingVic	Mar 31, 2022	24 Hours
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N) - Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA	Melbourne	Apr 04, 2022	28 Days
Total Kjeldahl Nitrogen (as N) - Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA	Melbourne	Apr 04, 2022	28 Days
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphate total (as P) - Method: LTM-INO-4040 Phosphate by CFA	Melbourne	Apr 04, 2022	28 Days

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Project Name: AURIZON
Project ID: 12552139

Order No.: 12552139
Report #: 875298
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Mar 29, 2022 1:40 PM
Due: Apr 5, 2022
Priority: 5 Day
Contact Name: Alyssa Barron

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Ammonia (as N)	Biochemical Oxygen Demand (BOD-5 Day)	Conductivity (at 25°C)	HOLD	Iron	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103°C-105°C	Turbidity	Eurofins Suite B7	Eurofins Suite B19A: Total N (TKN, NO _x), Total P
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																	
Brisbane Laboratory - NATA # 1261 Site # 20794																	
Mayfield Laboratory - NATA # 1261 Site # 25079																	
Perth Laboratory - NATA # 2377 Site # 2370																	
External Laboratory													X				
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID												
1	SW1	Mar 29, 2022		Water	N22-Ma60699	X	X	X	X		X	X	X	X	X	X	X
2	SW2	Mar 29, 2022		Water	N22-Ma60700	X	X	X	X		X	X	X	X	X	X	X
3	SW3	Mar 29, 2022		Water	N22-Ma60701	X	X	X	X		X	X	X	X	X	X	X
4	SW4	Mar 29, 2022		Water	N22-Ma60702	X	X	X	X		X	X	X	X	X	X	X
5	SW4A	Mar 29, 2022		Water	N22-Ma60703	X	X	X	X		X	X	X	X	X	X	X
6	SW5	Mar 29, 2022		Water	N22-Ma60704	X	X	X	X		X	X	X	X	X	X	X
7	SW6	Mar 29, 2022		Water	N22-Ma60705	X	X	X	X		X	X	X	X	X	X	X
8	SW7	Mar 29, 2022		Water	N22-Ma60706	X	X	X	X		X	X	X	X	X	X	X
9	SW8	Mar 29, 2022		Water	N22-Ma60707	X	X	X	X		X	X	X	X	X	X	X

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Project Name: AURIZON
Project ID: 12552139

Order No.: 12552139
Report #: 875298
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Mar 29, 2022 1:40 PM
Due: Apr 5, 2022
Priority: 5 Day
Contact Name: Alyssa Barron

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Ammonia (as N)	Biochemical Oxygen Demand (BOD-5 Day)	Conductivity (at 25°C)	HOLD	Ion	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103°C-105°C	Turbidity	Eurofins Suite B7	Eurofins Suite B19A: Total N (TKN, NO _x), Total P
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																	
Brisbane Laboratory - NATA # 1261 Site # 20794																	
Mayfield Laboratory - NATA # 1261 Site # 25079																	
Perth Laboratory - NATA # 2377 Site # 2370																	
External Laboratory													X				
10	SW9	Mar 29, 2022		Water	N22-Ma60708	X	X	X	X		X	X	X	X	X	X	X
11	SW11	Mar 29, 2022		Water	N22-Ma60709	X	X	X	X		X	X	X	X	X	X	X
12	BASIN 1	Mar 29, 2022		Water	N22-Ma60710	X	X	X	X		X	X	X	X	X	X	X
13	BASIN 2	Mar 29, 2022		Water	N22-Ma60711	X	X	X	X		X	X	X	X	X	X	X
14	BASIN 3	Mar 29, 2022		Water	N22-Ma60712	X	X	X	X		X	X	X	X	X	X	X
15	TS	Mar 29, 2022		Water	N22-Ma60713					X							
16	TB	Mar 29, 2022		Water	N22-Ma60714					X							
Test Counts						14	14	14	14	2	14	14	14	14	14	14	14

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	mg/L	< 5			5	Pass	
Conductivity (at 25°C)	uS/cm	< 10			10	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Phosphate total (as P)	mg/L	< 0.01			0.01	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Total Suspended Solids Dried at 103°C–105°C	mg/L	< 5			5	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/L	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Iron	mg/L	< 0.05			0.05	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	108			70-130	Pass	
TRH C10-C14	%	114			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	103			70-130	Pass	
Toluene	%	99			70-130	Pass	
Ethylbenzene	%	95			70-130	Pass	
m&p-Xylenes	%	89			70-130	Pass	
Xylenes - Total*	%	88			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	93			70-130	Pass	
TRH C6-C10	%	106			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	74			70-130	Pass	
Acenaphthylene	%	105			70-130	Pass	
Anthracene	%	78			70-130	Pass	
Benz(a)anthracene	%	115			70-130	Pass	
Benzo(a)pyrene	%	80			70-130	Pass	
Benzo(b&j)fluoranthene	%	102			70-130	Pass	
Benzo(g,h,i)perylene	%	91			70-130	Pass	
Benzo(k)fluoranthene	%	105			70-130	Pass	
Chrysene	%	111			70-130	Pass	
Dibenz(a,h)anthracene	%	83			70-130	Pass	
Fluoranthene	%	100			70-130	Pass	
Fluorene	%	128			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	85			70-130	Pass	
Naphthalene	%	89			70-130	Pass	
Phenanthrene	%	116			70-130	Pass	
Pyrene	%	101			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	119			70-130	Pass	
LCS - % Recovery							
Ammonia (as N)	%	89			70-130	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	%	105			85-115	Pass	
Conductivity (at 25°C)	%	91			70-130	Pass	
Nitrate & Nitrite (as N)	%	94			70-130	Pass	
Phosphate total (as P)	%	102			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	121			70-130	Pass	
Total Suspended Solids Dried at 103°C–105°C	%	104			70-130	Pass	
LCS - % Recovery							

Test		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heavy Metals								
Aluminium		%	90			80-120	Pass	
Arsenic		%	91			80-120	Pass	
Cadmium		%	94			80-120	Pass	
Chromium		%	91			80-120	Pass	
Copper		%	93			80-120	Pass	
Iron		%	90			80-120	Pass	
Lead		%	90			80-120	Pass	
Mercury		%	99			80-120	Pass	
Nickel		%	94			80-120	Pass	
Zinc		%	95			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C6-C9	M22-Ma67643	NCP	%	81		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	M22-Ma67643	NCP	%	105		70-130	Pass	
Toluene	M22-Ma67643	NCP	%	100		70-130	Pass	
Ethylbenzene	M22-Ma67643	NCP	%	81		70-130	Pass	
m&p-Xylenes	M22-Ma67643	NCP	%	76		70-130	Pass	
o-Xylene	M22-Ma67643	NCP	%	73		70-130	Pass	
Xylenes - Total*	M22-Ma67643	NCP	%	75		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	M22-Ma67643	NCP	%	90		70-130	Pass	
TRH C6-C10	M22-Ma67643	NCP	%	77		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C10-C14	N22-Ma60704	CP	%	108		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
TRH >C10-C16	N22-Ma60704	CP	%	111		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Aluminium	N22-Ma60708	CP	%	100		75-125	Pass	
Arsenic	N22-Ma60708	CP	%	97		75-125	Pass	
Cadmium	N22-Ma60708	CP	%	98		75-125	Pass	
Chromium	N22-Ma60708	CP	%	98		75-125	Pass	
Copper	N22-Ma60708	CP	%	96		75-125	Pass	
Iron	N22-Ma60708	CP	%	85		75-125	Pass	
Lead	N22-Ma60708	CP	%	100		75-125	Pass	
Mercury	N22-Ma60708	CP	%	106		75-125	Pass	
Nickel	N22-Ma60708	CP	%	97		75-125	Pass	
Zinc	N22-Ma60708	CP	%	90		75-125	Pass	
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	W22-Ma59698	NCP	%	80		70-130	Pass	
Acenaphthylene	W22-Ma59698	NCP	%	106		70-130	Pass	
Anthracene	W22-Ma59698	NCP	%	89		70-130	Pass	
Benz(a)anthracene	W22-Ma59698	NCP	%	90		70-130	Pass	
Benzo(a)pyrene	W22-Ma59698	NCP	%	88		70-130	Pass	
Benzo(b&j)fluoranthene	W22-Ma59698	NCP	%	112		70-130	Pass	
Benzo(g,h,i)perylene	W22-Ma59698	NCP	%	98		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(k)fluoranthene	W22-Ma59698	NCP	%	101			70-130	Pass	
Chrysene	W22-Ma59698	NCP	%	110			70-130	Pass	
Dibenz(a,h)anthracene	W22-Ma59698	NCP	%	95			70-130	Pass	
Fluoranthene	W22-Ma59698	NCP	%	94			70-130	Pass	
Fluorene	W22-Ma59698	NCP	%	99			70-130	Pass	
Indeno(1.2.3-cd)pyrene	W22-Ma59698	NCP	%	94			70-130	Pass	
Naphthalene	W22-Ma59698	NCP	%	84			70-130	Pass	
Phenanthrene	W22-Ma59698	NCP	%	94			70-130	Pass	
Pyrene	W22-Ma59698	NCP	%	93			70-130	Pass	
Spike - % Recovery									
				Result 1					
Total Kjeldahl Nitrogen (as N)	N22-Ma60709	CP	%	110			70-130	Pass	
Spike - % Recovery									
				Result 1					
Total Suspended Solids Dried at 103°C–105°C	N22-Ma60710	CP	%	94			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	N22-Ma60712	CP	%	84			75-125	Pass	
Arsenic	N22-Ma60712	CP	%	89			75-125	Pass	
Cadmium	N22-Ma60712	CP	%	88			75-125	Pass	
Chromium	N22-Ma60712	CP	%	87			75-125	Pass	
Copper	N22-Ma60712	CP	%	90			75-125	Pass	
Lead	N22-Ma60712	CP	%	87			75-125	Pass	
Mercury	N22-Ma60712	CP	%	92			75-125	Pass	
Nickel	N22-Ma60712	CP	%	89			75-125	Pass	
Zinc	N22-Ma60712	CP	%	93			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	M22-Ma61145	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Conductivity (at 25°C)	N22-Ma60699	CP	uS/cm	450	480	5.0	30%	Pass	
Nitrate & Nitrite (as N)	M22-Ma61145	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
pH (at 25 °C)	N22-Ma60699	CP	pH Units	7.8	7.9	pass	30%	Pass	
Phosphate total (as P)	M22-Ma67268	NCP	mg/L	0.16	0.15	5.0	30%	Pass	
Total Kjeldahl Nitrogen (as N)	N22-Ma60699	CP	mg/L	2.3	2.2	3.2	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (at 25°C)	N22-Ma60700	CP	uS/cm	440	460	3.0	30%	Pass	
pH (at 25 °C)	N22-Ma60700	CP	pH Units	7.8	7.8	pass	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	N22-Ma60702	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	N22-Ma60702	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	N22-Ma60702	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g,h,i)perylene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(k)fluoranthene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a,h)anthracene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	N22-Ma60702	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	N22-Ma60702	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	N22-Ma60702	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	N22-Ma60702	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	N22-Ma60708	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	N22-Ma60708	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	N22-Ma60708	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	N22-Ma60708	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	N22-Ma60708	CP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	N22-Ma60708	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	N22-Ma60708	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	N22-Ma60708	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	N22-Ma60708	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Biochemical Oxygen Demand (BOD-5 Day)	N22-Ma60708	CP	mg/L	< 5	< 5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	N22-Ma60708	CP	mg/L	0.43	0.45	3.0	30%	Pass	
Arsenic	N22-Ma60708	CP	mg/L	0.002	0.002	6.0	30%	Pass	
Cadmium	N22-Ma60708	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	N22-Ma60708	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	N22-Ma60708	CP	mg/L	0.003	0.003	<1	30%	Pass	
Iron	N22-Ma60708	CP	mg/L	1.3	1.3	1.0	30%	Pass	
Lead	N22-Ma60708	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	N22-Ma60708	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	N22-Ma60708	CP	mg/L	0.002	0.002	18	30%	Pass	
Zinc	N22-Ma60708	CP	mg/L	0.005	0.039	150	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (at 25°C)	N22-Ma60709	CP	uS/cm	460	460	<1	30%	Pass	
pH (at 25 °C)	N22-Ma60709	CP	pH Units	7.6	7.6	pass	30%	Pass	
Total Suspended Solids Dried at 103°C–105°C	N22-Ma60709	CP	mg/L	16	19	19	30%	Pass	
Turbidity	N22-Ma60709	CP	NTU	10	7.4	31	30%	Fail	Q15

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium	N22-Ma60712	CP	mg/L	0.12	0.13	6.0	30%	Pass
Arsenic	N22-Ma60712	CP	mg/L	0.002	0.002	12	30%	Pass
Cadmium	N22-Ma60712	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium	N22-Ma60712	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper	N22-Ma60712	CP	mg/L	0.003	0.003	6.0	30%	Pass
Iron	N22-Ma60712	CP	mg/L	5.8	5.8	<1	30%	Pass
Lead	N22-Ma60712	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury	N22-Ma60712	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	N22-Ma60712	CP	mg/L	0.005	0.006	10	30%	Pass
Zinc	N22-Ma60712	CP	mg/L	0.019	0.028	40	30%	Fail

Q15

Comments

Thermotolerant coliforms analysed by; Eurofins Food Testing; accreditation number 20293; report reference AR-22-NV-004097-01

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Andrew Black	Analytical Services Manager
Joseph Edouard	Senior Analyst (VIC)
Mary Makarios	Senior Analyst (NSW)
Caitlin Breeze	Senior Analyst (VIC)
Vivian Wang	Senior Analyst (VIC)
Scott Beddoes	Senior Analyst (NSW)
Edward Lee	Senior Analyst (VIC)
Harry Bacalis	Senior Analyst (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

ANALYTICAL REPORT

REPORT CODE
AR-22-NV-004097-01
REPORT DATE
01/04/2022

For the attention of

Eurofins Environment Testing Australia Pty Ltd

Analytical Reports

6 Monterey Road

Dandenong South

3175 Melbourne

AUSTRALIA

Phone +61 3 8564 5064

Email EnviroReportsau@eurofins.com

Contact for your orders:

Ruvini Herath

Order code:

EUAUTWU-00015461

Submission Reference:

 Merged from order
cau001-order-875298-220330.xml

Purchase Order Number:

875298

SAMPLE CODE
726-2022-00011515
Client Reference:

22-Ma60699

Sample described as:

SW1

Reception Date:

30/03/2022

Analysis Starting Date:

31/03/2022

Sampled Date & Time

29/03/2022 12:00:00

Reception temperature:

3.9 °C

Analysis Ending Date:

01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	430	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE
726-2022-00011516
Client Reference:

22-Ma60700

Sample described as:

SW2

Reception Date:

30/03/2022

Analysis Starting Date:

31/03/2022

Sampled Date & Time

29/03/2022 12:00:00

Reception temperature:

3.9 °C

Analysis Ending Date:

01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	1900	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE
726-2022-00011517
Client Reference:

22-Ma60701

Sample described as:

SW3

Reception Date:

30/03/2022

Analysis Starting Date:

31/03/2022

Sampled Date & Time

29/03/2022 12:00:00

Reception temperature:

3.9 °C

Analysis Ending Date:

01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	7700	cfu/100 ml	1
--------------------------	------	------------	---

Eurofins Food Testing Australia Pty Ltd

 6 Monterey Road
Dandenong South
Melbourne
VIC 3175
AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

Accredited for compliance with ISO/IEC 17025 - Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
Accreditation Number 20293



SAMPLE CODE 726-2022-00011518

Client Reference: 22-Ma60702
Sample described as: SW4
Reception Date: 30/03/2022
Analysis Starting Date: 31/03/2022
Sampled Date & Time: 29/03/2022 12:00:00

Reception temperature: 3.9 °C
Analysis Ending Date: 01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	17000	cfu/100 ml	1
--------------------------	-------	------------	---

SAMPLE CODE 726-2022-00011519

Client Reference: 22-Ma60703
Sample described as: SW4A
Reception Date: 30/03/2022
Analysis Starting Date: 31/03/2022
Sampled Date & Time: 29/03/2022 12:00:00

Reception temperature: 3.9 °C
Analysis Ending Date: 01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	2500	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE 726-2022-00011520

Client Reference: 22-Ma60704
Sample described as: SW5
Reception Date: 30/03/2022
Analysis Starting Date: 31/03/2022
Sampled Date & Time: 29/03/2022 12:00:00

Reception temperature: 3.9 °C
Analysis Ending Date: 01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	4100	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE 726-2022-00011521

Client Reference: 22-Ma60705
Sample described as: SW6
Reception Date: 30/03/2022
Analysis Starting Date: 31/03/2022
Sampled Date & Time: 29/03/2022 12:00:00

Reception temperature: 3.9 °C
Analysis Ending Date: 01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	880	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE 726-2022-00011522

Client Reference: 22-Ma60706
Sample described as: SW7
Reception Date: 30/03/2022
Analysis Starting Date: 31/03/2022
Sampled Date & Time: 29/03/2022 12:00:00

Reception temperature: 3.9 °C
Analysis Ending Date: 01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	810	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE 726-2022-00011523

Client Reference: 22-Ma60707
Sample described as: SW8
Reception Date: 30/03/2022
Analysis Starting Date: 31/03/2022
Sampled Date & Time: 29/03/2022 12:00:00

Reception temperature: 3.9 °C
Analysis Ending Date: 01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	1300	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE 726-2022-00011524

Client Reference: 22-Ma60708
Sample described as: SW9
Reception Date: 30/03/2022
Analysis Starting Date: 31/03/2022
Sampled Date & Time: 29/03/2022 12:00:00

Reception temperature: 3.9 °C
Analysis Ending Date: 01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	52	cfu/100 ml	1
--------------------------	----	------------	---

SAMPLE CODE 726-2022-00011525

Client Reference: 22-Ma60709
Sample described as: SW11
Reception Date: 30/03/2022
Analysis Starting Date: 31/03/2022
Sampled Date & Time: 29/03/2022 12:00:00

Reception temperature: 3.9 °C
Analysis Ending Date: 01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	110	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE 726-2022-00011526

Client Reference: 22-Ma60710
Sample described as: BASIN 1
Reception Date: 30/03/2022
Analysis Starting Date: 31/03/2022
Sampled Date & Time: 29/03/2022 12:00:00

Reception temperature: 3.9 °C
Analysis Ending Date: 01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	52	cfu/100 ml	1
--------------------------	----	------------	---

SAMPLE CODE 726-2022-00011527

Client Reference: 22-Ma60711
Sample described as: BASIN 2
Reception Date: 30/03/2022
Analysis Starting Date: 31/03/2022
Sampled Date & Time: 29/03/2022 12:00:00

Reception temperature: 3.9 °C
Analysis Ending Date: 01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	3300	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE 726-2022-00011528

Client Reference: 22-Ma60712
Sample described as: BASIN 3
Reception Date: 30/03/2022
Analysis Starting Date: 31/03/2022
Sampled Date & Time: 29/03/2022 12:00:00

Reception temperature: 3.9 °C
Analysis Ending Date: 01/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 31/03/2022 0:00

Thermotolerant coliforms	4100	cfu/100 ml	1
--------------------------	------	------------	---

LIST OF METHODS

VQ792 Thermotolerant Coliforms: AS 4276.7

Signature

Di Shen Scientist

Eurofins Food Testing Australia Pty Ltd

 6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

Accredited for compliance with ISO/IEC 17025 - Testing
 NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
 Accreditation Number 20293



EXPLANATORY NOTE

- ◆ test is not accredited
- test is subcontracted within Eurofins group and is accredited
- test is subcontracted within Eurofins group and is not accredited
- test is subcontracted outside Eurofins group and is accredited
- test is subcontracted outside Eurofins group and is not accredited

N/A means Not applicable

Not Detected means not detected at or above the Limit of Quantification (LOQ)

LOQ Limit of Quantification

U Measurement Uncertainty

< Less than, ≤ Less than or equal to

> Greater than, ≥ Greater than or equal to

The tests are identified by a 5 digit code, full details can be provided on request.

Information supplied by the client. This information can have an impact on the validity of results.

Samples are tested as received and the results relate only to the sample tested.

Analysis date is reported as the start date of extraction for a method.

The results may not be reproduced except in full, without a written approval from the laboratory.

Eurofins General Terms and Conditions apply.

END OF REPORT

Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

Accredited for compliance with ISO/IEC 17025 - Testing
 NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
 Accreditation Number 20293





CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 065 521

Sydney Laboratory
179 Magower Road, Goswain, NSW 2145
+61 2 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1/21 Smallwood Place, Muramba, QLD 4172
+61 7 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
48-48 Banksia Road, Welshpool, WA 6105
+61 8 6253 4444 EnviroSampleWA@eurofins.com

Melbourne Laboratory
8 Montrose Road Dandenong South VIC 3175
+61 3 8564 5000 EnviroSampleVic@eurofins.com

1 of 2.

Company	GHD.	Project No	A 125525 12552139	Project Manager	A. Barron	Sampler(s)	Michael Swinfeld.
Address	GHD Tower, honeyuckle	Project Name	Avizo	EDD Format	ESdel, EQS etc	Handed over by	M. Swinfeld.
Contact Name	Michael Swinfeld	Analyses Where metals are requested, please specify "Total" or "Filtered". SULTE code must be used for all acid SULTE pricing.	Total metals. pH, conductivity, turbidity Suspended Solids Suite B19A. Thermotolerant coliforms BOD 5 day.	Email for Invoice	alyson.barron@ghd.com	Email for Results	" + Leslie.
Phone No	0431453335			Containers		Required Turnaround Time (TAT)	
Special Directions				Change container type & size if necessary.		Default will be 5 days, if not ticked.	
Purchase Order	12552139.			<input type="checkbox"/> Overnight (reporting by 9am) <input type="checkbox"/> Same day <input type="checkbox"/> 1 day <input type="checkbox"/> 2 days <input checked="" type="checkbox"/> 5 days (Standard) <input type="checkbox"/> 3 <input type="checkbox"/> Other			
Quote ID No						<input type="checkbox"/> 500mL Plastic <input type="checkbox"/> 250mL Plastic <input type="checkbox"/> 125mL Plastic <input type="checkbox"/> 200mL Amber Glass <input type="checkbox"/> 40mL VOA vial <input type="checkbox"/> 500mL PFAS Bottle <input type="checkbox"/> Jar (Glass or HDPE) <input checked="" type="checkbox"/> Jar (Polyester AS4964, WA Quinacres)	

Client Sample ID	Sampled Date/Time	Matrix	Analyses							Containers			Sample Comments					
	dd/mm/yyyy hh:mm	Solid (S) Water (W)	B4	Total metals	pH, conductivity, turbidity	Suspended Solids	Suite B19A	Thermotolerant coliforms	BOD 5 day	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Jar (Polyester AS4964, WA Quinacres)	/ Dangerous Goods Hazard Warning
SW1	29-3-22	Water	X	X	X	X	X	X	X	2			1	2		4		
SW2																		
SW3																		
SW4																		
SW4A																		
SW5																		
SW6																		
SW7																		
SW8																		
SW9																		
Total Counts																		

Method of Shipment	<input type="checkbox"/> Courier (#)	<input type="checkbox"/> Hand-Delivered	<input type="checkbox"/> Postal	Name	Signature	Date	Time
Laboratory Use Only	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature	4.2
	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report No	875298



CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

Sydney Laboratory
179 Magowar Road, Girraween, NSW 2145
+61 2 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1/21 Smallwood Place, Murarie, QLD 4172
+61 7 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
46-48 Bankala Road, Westpool, WA 6106
+61 8 6253 4444 EnviroSampleWA@eurofins.com

Melbourne Laboratory
8 Montfery Road Dandenong South VIC 3175
+61 3 8564 5000 EnviroSampleVIC@eurofins.com

2 OK 2

Company: GH0.		Project No: 72552139.		Project Manager:		Sampler(s): M-Saint-John												
Address:		Project Name: Aurizon		EOD Format: ES&I, EC&IS etc		Handed over by:												
Contact Name:		Analyses: B4. Total metals. pH conductivity turbidity, suspended solids. Suite B19A. Thermo. coliforms. BOD 5 day. Hold.		Email for Invoice:		Email for Results:												
Phone No: 0431453335				Containers: Change container type & size if necessary.		Required Turnaround Time (TAT): Default will be 5 days if not ticked.		<input type="checkbox"/> Overnight (reporting by 9am) <input type="checkbox"/> Same day <input type="checkbox"/> 1 day <input type="checkbox"/> 2 days <input checked="" type="checkbox"/> 5 days (Standard) <input type="checkbox"/> 3 <input type="checkbox"/> Other										
Special Directions:				500mL Plastic		250mL Plastic		125mL Plastic										
Purchase Order:				200mL Amber Glass		40mL VOA vial		500mL PFAS Bottle										
Quote ID No:		Jar (Glass or HDPE)		Other (Asbestos AB&P&A, WA G (d&I) Ina)		Sample Comments / Dangerous Goods Hazard Warning												
Client Sample ID	Sampled Date/Time	Matrix Solid (S) Water (W)	B4. Total metals. pH conductivity turbidity, suspended solids. Suite B19A. Thermo. coliforms. BOD 5 day. Hold.							500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AB&P&A, WA G (d&I) Ina)	Sample Comments / Dangerous Goods Hazard Warning
1 SW11	29.3.22	Water	X	X	X	X	X	X	X									
2 Basin 1																		
3 ↓ 2																		
4 ↓ 3																		
5 TS/TB.		Soil																
Total Counts																		

Method of Shipment: <input type="checkbox"/> Courier (#) <input type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal	Name:	Signature:	Date:	Time:
Received By: AR	SYD | BNE | MEL | PER | ADX | NTL | DRW	Signature:	Date:	Time:
Received By: AR	SYD | BNE | MEL | PER | ADX | NTL | DRW	Signature:	Date: 29.3.22	Time: 1:40pm
Report No: 875298				

From: Leslie Maranciak <Leslie.Maranciak@ghd.com>
Sent: Wednesday, 30 March 2022 4:53 PM
To: #AU08_EnviroSampleNTL <EnviroSampleNTL@eurofins.com>
Cc: Alyssa Barron <Alyssa.Barron@ghd.com>
Subject: RE: Eurofins Sample Receipt Advice - Report 875298 : Site AURIZON (12552139)

Hi Quinn-

Can you please add ammonia, iron and aluminium analysis to all samples? Also the faecal coliforms should be reported in CFU/100mL (if won't already).

Thanks,
Leslie

From: EnviroSampleNTL@eurofins.com <EnviroSampleNTL@eurofins.com>
Sent: Wednesday, 30 March 2022 4:34 PM
To: Alyssa Barron <alyssa.barron@ghd.com>
Cc: Leslie Maranciak <leslie.maranciak@ghd.com>
Subject: Eurofins Sample Receipt Advice - Report 875298 : Site AURIZON (12552139)

Dear Valued Client,

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins Analytical Services Manager as soon as possible to make certain that they get changed.

Kind Regards,

Quinn Raw
Sample Receipt Officer
(she / they)

Eurofins Environment Testing Australia Pty Ltd
Unit 7, 7 Friesian Close
Sandgate, NSW Australia, 2304
Mobile: +61 459 786 036

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **Leslie Maranciak**

Report **878796-W**
Project name **AURIZON HEXHAM WATER MONITORING**
Project ID **12552139**
Received Date **Apr 07, 2022**

Client Sample ID			MW101R	MW108R	MW109	MW307R
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Ap0020161	M22- Ap0020162	M22- Ap0020163	M22- Ap0020164
Date Sampled			Apr 07, 2022	Apr 07, 2022	Apr 07, 2022	Apr 07, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	109	108	114	103
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			MW101R	MW108R	MW109	MW307R
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Ap0020161	M22- Ap0020162	M22- Ap0020163	M22- Ap0020164
Date Sampled			Apr 07, 2022	Apr 07, 2022	Apr 07, 2022	Apr 07, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	81	53	55	87
p-Terphenyl-d14 (surr.)	1	%	132	58	103	60
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	1.6	0.33	0.02	R0942
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 20	< 5	< 5	< 5
Conductivity (at 25°C)						
Conductivity (at 25°C)	10	uS/cm	19000	3400	3100	33000
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	0.13	< 0.05	< 0.05	0.07
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	7.1	7.3	7.9	7.7
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.84	0.06	4.1	7.4
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	2.7	0.4	11	R0926
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	2.83	0.4	11	26.07
Total Suspended Solids Dried at 103°C–105°C						
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	54	31	95	41
Turbidity						
Turbidity	1	NTU	220	43	54	13
Heavy Metals						
Arsenic (filtered)						
Arsenic (filtered)	0.001	mg/L	0.010	< 0.001	< 0.001	< 0.001
Cadmium (filtered)						
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)						
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	0.001	0.001
Copper (filtered)						
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Iron (filtered)						
Iron (filtered)	0.05	mg/L	22	0.91	0.52	0.12
Lead (filtered)						
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)						
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)						
Nickel (filtered)	0.001	mg/L	0.028	0.005	< 0.001	< 0.001
Zinc (filtered)						
Zinc (filtered)	0.005	mg/L	0.16	0.028	< 0.005	< 0.005
Pathogens						
Thermotolerant Coliforms (CFU)						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			MW308R	RB02
Sample Matrix			Water	Water
Eurofins Sample No.			M22- Ap0020165	M22- Ap0020166
Date Sampled			Apr 07, 2022	Apr 07, 2022
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons				
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1
Naphthalene^{N02}				
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01
TRH C6-C10				
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)^{N04}				
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02
TRH >C10-C16				
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)^{N01}				
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05
TRH >C16-C34				
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1

Client Sample ID			MW308R	RB02
Sample Matrix			Water	Water
Eurofins Sample No.			M22- Ap0020165	M22- Ap0020166
Date Sampled			Apr 07, 2022	Apr 07, 2022
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons				
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1
BTEX				
Benzene	0.001	mg/L	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	105	103
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	0.001	mg/L	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	60	136
p-Terphenyl-d14 (surr.)	1	%	52	71
Ammonia (as N)				
Ammonia (as N)	0.01	mg/L	1.1	-
Biochemical Oxygen Demand (BOD-5 Day)				
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	-
Conductivity (at 25°C)				
Conductivity (at 25°C)	10	uS/cm	8400	-
Nitrate & Nitrite (as N)				
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05
pH (at 25 °C)				
pH (at 25 °C)	0.1	pH Units	7.0	-
Phosphate total (as P)				
Phosphate total (as P)	0.01	mg/L	0.34	< 0.01
Total Kjeldahl Nitrogen (as N)				
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	1.6	0.8
Total Nitrogen (as N)*				
Total Nitrogen (as N)*	0.2	mg/L	1.6	0.8
Total Suspended Solids Dried at 103°C–105°C				
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	59	-
Turbidity				
Turbidity	1	NTU	160	-
Heavy Metals				
Arsenic	0.001	mg/L	-	< 0.001
Arsenic (filtered)	0.001	mg/L	0.003	-
Cadmium	0.0002	mg/L	-	< 0.0002
Cadmium (filtered)	0.0002	mg/L	< 0.0002	-
Chromium	0.001	mg/L	-	< 0.001
Chromium (filtered)	0.001	mg/L	< 0.001	-

Client Sample ID			MW308R	RB02
Sample Matrix			Water	Water
Eurofins Sample No.			M22- Ap0020165	M22- Ap0020166
Date Sampled			Apr 07, 2022	Apr 07, 2022
Test/Reference	LOR	Unit		
Heavy Metals				
Copper	0.001	mg/L	-	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	-
Iron	0.05	mg/L	-	< 0.05
Iron (filtered)	0.05	mg/L	51	-
Lead	0.001	mg/L	-	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	-
Mercury	0.0001	mg/L	-	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	-
Nickel	0.001	mg/L	-	< 0.001
Nickel (filtered)	0.001	mg/L	0.003	-
Zinc	0.005	mg/L	-	< 0.005
Zinc (filtered)	0.005	mg/L	< 0.005	-
Pathogens				
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 13, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 13, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 13, 2022	7 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Melbourne	Apr 13, 2022	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Apr 13, 2022	7 Days
Ammonia (as N) - Method: APHA 4500-NH3 Ammonia Nitrogen by FIA	Melbourne	Apr 13, 2022	28 Days
Biochemical Oxygen Demand (BOD-5 Day) - Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water	Melbourne	Apr 13, 2022	2 Days
Conductivity (at 25°C) - Method: LTM-INO-4030 Conductivity	Melbourne	Apr 13, 2022	28 Days
pH (at 25 °C) - Method: LTM-GEN-7090 pH in water by ISE	Melbourne	Apr 13, 2022	0 Hours
Total Suspended Solids Dried at 103°C–105°C - Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry	Melbourne	Apr 13, 2022	7 Days
Turbidity - Method: Turbidity by classical using APHA 2130B (LTM-INO-4140)	Melbourne	Apr 13, 2022	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Apr 13, 2022	28 Days
Heavy Metals (filtered) - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Apr 13, 2022	180 Days
Mobil Metals : Metals M15 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Apr 13, 2022	28 Days
Thermotolerant Coliforms (CFU) - Method: LTM-MIC-6607 Microbes by Membrane Filtration AS/NZS 4276.7:2007	WaterTestingVic	Apr 09, 2022	24 Hours
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N) - Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA	Melbourne	Apr 13, 2022	28 Days
Total Kjeldahl Nitrogen (as N) - Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA	Melbourne	Apr 13, 2022	28 Days
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphate total (as P) - Method: LTM-INO-4040 Phosphate by CFA	Melbourne	Apr 13, 2022	28 Days

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.:
Report #: 878796
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Apr 7, 2022 2:59 PM
Due: Apr 14, 2022
Priority: 5 Day
Contact Name: Leslie Maranciak

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12552139

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Ammonia (as N)	Arsenic	Arsenic (filtered)	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Cadmium (filtered)	Chromium	Chromium (filtered)	Conductivity (at 25°C)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	pH (at 25 °C)	Thermolabile Coliforms (CFU)	Total Suspended Solids Dried at 103°C-105°C	Turbidity	Zinc	Zinc (filtered)	Eurofins Suite B4	Eurofins Suite B19A: Total N (TKN, NOx), Total P	Eurofins Suite B16A: SO4, CH4, NO3, Fe2+			
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Sydney Laboratory - NATA # 1261 Site # 18217																																				
Brisbane Laboratory - NATA # 1261 Site # 20794																																				
Mayfield Laboratory - NATA # 1261 Site # 25079																																				
Perth Laboratory - NATA # 2377 Site # 2370																																				
External Laboratory																									X											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																															
1	MW101R	Apr 07, 2022		Water	M22-Ap0020161	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
2	MW108R	Apr 07, 2022		Water	M22-Ap0020162	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	MW109	Apr 07, 2022		Water	M22-Ap0020163	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	MW307R	Apr 07, 2022		Water	M22-Ap0020164	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	MW308R	Apr 07, 2022		Water	M22-Ap0020165	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	RB02	Apr 07, 2022		Water	M22-		X		X	X				X		X	X	X	X	X	X	X					X		X						X	

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.:
Report #: 878796
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Apr 7, 2022 2:59 PM
Due: Apr 14, 2022
Priority: 5 Day
Contact Name: Leslie Maranciak

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12552139

Eurofins Analytical Services Manager : Andrew Black

Sample Detail	Ammonia (as N)	Arsenic	Arsenic (filtered)	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Cadmium (filtered)	Chromium	Chromium (filtered)	Conductivity (at 25°C)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	pH (at 25 °C)	Thermolabile Coliforms (CFU)	Total Suspended Solids Dried at 103°C-105°C	Turbidity	Zinc	Zinc (filtered)	Eurofins Suite B4	Eurofins Suite B19A: Total N (TKN, NOx), Total P	Eurofins Suite B16A: SO4, CH4, NO3, Fe2+
Melbourne Laboratory - NATA # 1261 Site # 1254	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																												
Brisbane Laboratory - NATA # 1261 Site # 20794																												
Mayfield Laboratory - NATA # 1261 Site # 25079																												
Perth Laboratory - NATA # 2377 Site # 2370																												
External Laboratory																					X							
Test Counts	5	1	5	5	1	5	1	5	5	1	5	1	5	1	5	1	5	1	5	5	5	5	5	1	5	6	6	1

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	mg/L	< 5			5	Pass	
Conductivity (at 25°C)	uS/cm	< 10			10	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Phosphate total (as P)	mg/L	< 0.01			0.01	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Total Suspended Solids Dried at 103°C–105°C	mg/L	< 5			5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Chromium (filtered)	mg/L	< 0.001		0.001	Pass	
Copper	mg/L	< 0.001		0.001	Pass	
Copper (filtered)	mg/L	< 0.001		0.001	Pass	
Iron	mg/L	< 0.05		0.05	Pass	
Iron (filtered)	mg/L	< 0.05		0.05	Pass	
Lead	mg/L	< 0.001		0.001	Pass	
Lead (filtered)	mg/L	< 0.001		0.001	Pass	
Mercury	mg/L	< 0.0001		0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001		0.0001	Pass	
Nickel	mg/L	< 0.001		0.001	Pass	
Nickel (filtered)	mg/L	< 0.001		0.001	Pass	
Zinc	mg/L	< 0.005		0.005	Pass	
Zinc (filtered)	mg/L	< 0.005		0.005	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons						
TRH C6-C9	%	119		70-130	Pass	
TRH C10-C14	%	101		70-130	Pass	
Naphthalene	%	107		70-130	Pass	
TRH C6-C10	%	119		70-130	Pass	
TRH >C10-C16	%	106		70-130	Pass	
LCS - % Recovery						
BTEX						
Benzene	%	115		70-130	Pass	
Toluene	%	106		70-130	Pass	
Ethylbenzene	%	96		70-130	Pass	
m&p-Xylenes	%	104		70-130	Pass	
Xylenes - Total*	%	108		70-130	Pass	
LCS - % Recovery						
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	%	116		70-130	Pass	
Acenaphthylene	%	79		70-130	Pass	
Anthracene	%	92		70-130	Pass	
Benz(a)anthracene	%	77		70-130	Pass	
Benzo(a)pyrene	%	76		70-130	Pass	
Benzo(b&j)fluoranthene	%	112		70-130	Pass	
Benzo(g,h,i)perylene	%	114		70-130	Pass	
Benzo(k)fluoranthene	%	97		70-130	Pass	
Chrysene	%	91		70-130	Pass	
Dibenz(a,h)anthracene	%	80		70-130	Pass	
Fluoranthene	%	96		70-130	Pass	
Fluorene	%	103		70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	101		70-130	Pass	
Naphthalene	%	112		70-130	Pass	
Phenanthrene	%	116		70-130	Pass	
Pyrene	%	105		70-130	Pass	
LCS - % Recovery						
Ammonia (as N)	%	99		70-130	Pass	
Conductivity (at 25°C)	%	101		70-130	Pass	
Nitrate & Nitrite (as N)	%	101		70-130	Pass	
Phosphate total (as P)	%	107		70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	90		70-130	Pass	
LCS - % Recovery						
Heavy Metals						
Arsenic	%	90		80-120	Pass	

Test				Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Cadmium				%	92		80-120	Pass	
Chromium				%	95		80-120	Pass	
Copper				%	96		80-120	Pass	
Iron				%	92		80-120	Pass	
Lead				%	90		80-120	Pass	
Mercury				%	94		80-120	Pass	
Nickel				%	96		80-120	Pass	
Zinc				%	93		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons					Result 1				
TRH C6-C9	M22-Ap0026929	NCP	%	112			70-130	Pass	
TRH C10-C14	S22-Ap0024639	NCP	%	256			70-130	Fail	Q08
Naphthalene	M22-Ap0020429	NCP	%	115			70-130	Pass	
TRH C6-C10	M22-Ap0026929	NCP	%	109			70-130	Pass	
TRH >C10-C16	S22-Ap0024639	NCP	%	267			70-130	Fail	Q08
Spike - % Recovery									
BTEX					Result 1				
Benzene	M22-Ap0026929	NCP	%	98			70-130	Pass	
Toluene	M22-Ap0026929	NCP	%	94			70-130	Pass	
Ethylbenzene	M22-Ap0026929	NCP	%	84			70-130	Pass	
m&p-Xylenes	M22-Ap0026929	NCP	%	100			70-130	Pass	
o-Xylene	M22-Ap0026929	NCP	%	105			70-130	Pass	
Xylenes - Total*	M22-Ap0026929	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons					Result 1				
Acenaphthene	B22-Ap0023767	NCP	%	90			70-130	Pass	
Acenaphthylene	B22-Ap0023767	NCP	%	80			70-130	Pass	
Anthracene	B22-Ap0023767	NCP	%	103			70-130	Pass	
Benz(a)anthracene	B22-Ap0023767	NCP	%	73			70-130	Pass	
Benzo(a)pyrene	B22-Ap0023767	NCP	%	92			70-130	Pass	
Benzo(b&i)fluoranthene	B22-Ap0023767	NCP	%	90			70-130	Pass	
Benzo(g,h,i)perylene	B22-Ap0023767	NCP	%	105			70-130	Pass	
Benzo(k)fluoranthene	B22-Ap0023767	NCP	%	84			70-130	Pass	
Chrysene	B22-Ap0023767	NCP	%	106			70-130	Pass	
Dibenz(a,h)anthracene	B22-Ap0023767	NCP	%	76			70-130	Pass	
Fluoranthene	B22-Ap0023767	NCP	%	93			70-130	Pass	
Fluorene	B22-Ap0023767	NCP	%	78			70-130	Pass	
Indeno(1,2,3-cd)pyrene	B22-Ap0023767	NCP	%	88			70-130	Pass	
Naphthalene	B22-Ap0023767	NCP	%	81			70-130	Pass	
Phenanthrene	B22-Ap0023767	NCP	%	86			70-130	Pass	
Pyrene	B22-Ap0023767	NCP	%	96			70-130	Pass	
Spike - % Recovery									
					Result 1				
Total Kjeldahl Nitrogen (as N)	M22-Ap0020337	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Heavy Metals					Result 1				
Iron (filtered)	M22-Ap0015718	NCP	%	88			75-125	Pass	
Spike - % Recovery									
Heavy Metals					Result 1				
Arsenic (filtered)	M22-Ap0020165	CP	%	97			75-125	Pass	
Cadmium (filtered)	M22-Ap0020165	CP	%	91			75-125	Pass	
Chromium (filtered)	M22-Ap0020165	CP	%	95			75-125	Pass	
Copper (filtered)	M22-Ap0020165	CP	%	91			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead (filtered)	M22-Ap0020165	CP	%	86			75-125	Pass	
Mercury (filtered)	M22-Ap0020165	CP	%	90			75-125	Pass	
Nickel (filtered)	M22-Ap0020165	CP	%	93			75-125	Pass	
Zinc (filtered)	M22-Ap0020165	CP	%	91			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M22-Ap0026920	NCP	%	92			75-125	Pass	
Cadmium	M22-Ap0026920	NCP	%	90			75-125	Pass	
Chromium	M22-Ap0026920	NCP	%	95			75-125	Pass	
Copper	M22-Ap0026920	NCP	%	92			75-125	Pass	
Iron	M22-Ap0026920	NCP	%	79			75-125	Pass	
Lead	M22-Ap0026920	NCP	%	90			75-125	Pass	
Mercury	M22-Ap0026920	NCP	%	95			75-125	Pass	
Nickel	M22-Ap0026920	NCP	%	92			75-125	Pass	
Zinc	M22-Ap0026920	NCP	%	91			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	M22-Ap0026928	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M22-Ap0020161	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M22-Ap0020161	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M22-Ap0020161	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Naphthalene	M22-Ap0026928	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M22-Ap0026928	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	M22-Ap0020161	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M22-Ap0020161	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M22-Ap0020161	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M22-Ap0026928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M22-Ap0026928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M22-Ap0026928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M22-Ap0026928	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M22-Ap0026928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	M22-Ap0026928	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&i)fluoranthene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g,h,i)perylene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a,h)anthracene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M22-Ap0019646	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate				Result 1	Result 2	RPD		
Biochemical Oxygen Demand (BOD-5 Day)	S22-Ap0019713	NCP	mg/L	< 5	< 5	<1	30%	Pass
Conductivity (at 25°C)	B22-Ap0021379	NCP	uS/cm	8900	8900	<1	30%	Pass
pH (at 25 °C)	B22-Ap0021379	NCP	pH Units	7.7	7.7	pass	30%	Pass
Total Kjeldahl Nitrogen (as N)	M22-Ap0015302	NCP	mg/L	< 0.2	< 0.2	<1	30%	Pass
Turbidity	M22-Ap0027719	NCP	NTU	< 1	< 1	<1	30%	Pass
Duplicate				Result 1	Result 2	RPD		
Phosphate total (as P)	M22-Ap0020163	CP	mg/L	4.1	5.3	25	30%	Pass
Duplicate				Result 1	Result 2	RPD		
Ammonia (as N)	M22-Ap0020165	CP	mg/L	1.1	1.1	1.0	30%	Pass
Nitrate & Nitrite (as N)	M22-Ap0020165	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate				Result 1	Result 2	RPD		
Heavy Metals				Result 1	Result 2	RPD		
Arsenic (filtered)	M22-Ap0020165	CP	mg/L	0.003	0.003	3.0	30%	Pass
Cadmium (filtered)	M22-Ap0020165	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium (filtered)	M22-Ap0020165	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper (filtered)	M22-Ap0020165	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Iron (filtered)	M22-Ap0020165	CP	mg/L	51	52	3.0	30%	Pass
Lead (filtered)	M22-Ap0020165	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury (filtered)	M22-Ap0020165	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel (filtered)	M22-Ap0020165	CP	mg/L	0.003	0.003	10	30%	Pass
Zinc (filtered)	M22-Ap0020165	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Duplicate				Result 1	Result 2	RPD		
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0026920	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Cadmium	M22-Ap0026920	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium	M22-Ap0026920	NCP	mg/L	0.003	0.002	7.0	30%	Pass
Copper	M22-Ap0026920	NCP	mg/L	0.002	0.002	10	30%	Pass
Iron	M22-Ap0026920	NCP	mg/L	1.4	1.4	<1	30%	Pass
Lead	M22-Ap0026920	NCP	mg/L	0.003	0.003	3.0	30%	Pass
Mercury	M22-Ap0026920	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	M22-Ap0026920	NCP	mg/L	0.005	0.005	4.0	30%	Pass
Zinc	M22-Ap0026920	NCP	mg/L	0.008	0.010	14	30%	Pass

Comments

Thermotolerant coliforms analysed by; Eurofins Food Testing; accreditation number 20293; report reference AR-22-NV-004683-01

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.
R09	Theoretically the TKN result should be greater or equal to the ammonia concentration. However the difference reported is within the measurement uncertainty of the individual tests

Authorised by:

Andrew Black	Analytical Services Manager
Caitlin Breeze	Senior Analyst (VIC)
Scott Beddoes	Senior Analyst (NSW)
Harry Bacalis	Senior Analyst (NSW)
Mary Makarios	Senior Analyst (NSW)
Alex Petridis	Senior Analyst (NSW)
Edward Lee	Senior Analyst (VIC)
Joseph Edouard	Senior Analyst (VIC)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

ANALYTICAL REPORT

REPORT CODE
AR-22-NV-004683-01
REPORT DATE
12/04/2022

For the attention of

Eurofins Environment Testing Australia Pty Ltd

Analytical Reports

6 Monterey Road

Dandenong South

3175 Melbourne

AUSTRALIA

Phone +61 3 8564 5064

Email EnviroReportsau@eurofins.com

Contact for your orders:

Ruvini Herath

Order code:

EUAUTWU-00015964

Submission Reference:

 Merged from order
cau001-order-878796-220409.xml

Purchase Order Number:

878796

SAMPLE CODE
726-2022-00013148
Client Reference:

22-Ap0020161

Sample described as:

MW101R

Reception Date:

09/04/2022

Analysis Starting Date:

09/04/2022

Sampled Date & Time

07/04/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

11/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 9/04/2022 10:00

Thermotolerant coliforms	20	cfu/100 ml	1
--------------------------	----	------------	---

SAMPLE CODE
726-2022-00013149
Client Reference:

22-Ap0020162

Sample described as:

MW108R

Reception Date:

09/04/2022

Analysis Starting Date:

09/04/2022

Sampled Date & Time

07/04/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

12/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 9/04/2022 10:00

Thermotolerant coliforms	900	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE
726-2022-00013150
Client Reference:

22-Ap0020163

Sample described as:

MW109

Reception Date:

09/04/2022

Analysis Starting Date:

09/04/2022

Sampled Date & Time

07/04/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

12/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 9/04/2022 10:00

Thermotolerant coliforms	3100	cfu/100 ml	1
--------------------------	------	------------	---

Eurofins Food Testing Australia Pty Ltd

 6 Monterey Road
Dandenong South
Melbourne
VIC 3175
AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

Accredited for compliance with ISO/IEC 17025 - Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
Accreditation Number 20293



SAMPLE CODE 726-2022-00013151

Client Reference: 22-Ap0020164
Sample described as: MW307R
Reception Date: 09/04/2022
Analysis Starting Date: 09/04/2022
Sampled Date & Time: 07/04/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 11/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 9/04/2022 10:00

Thermotolerant coliforms	370	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE 726-2022-00013152

Client Reference: 22-Ap0020165
Sample described as: MW308R
Reception Date: 09/04/2022
Analysis Starting Date: 09/04/2022
Sampled Date & Time: 07/04/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 11/04/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 9/04/2022 10:00

Thermotolerant coliforms	30	cfu/100 ml	1
--------------------------	----	------------	---

LIST OF METHODS

 VQ792 **Thermotolerant Coliforms:** AS 4276.7

Signature

Di Shen Scientist

EXPLANATORY NOTE

- ◆ test is not accredited
- test is subcontracted within Eurofins group and is accredited
- test is subcontracted within Eurofins group and is not accredited
- test is subcontracted outside Eurofins group and is accredited
- test is subcontracted outside Eurofins group and is not accredited

N/A means Not applicable

Not Detected means not detected at or above the Limit of Quantification (LOQ)

LOQ Limit of Quantification

U Measurement Uncertainty

< Less than, ≤ Less than or equal to

> Greater than, ≥ Greater than or equal to

The tests are identified by a 5 digit code, full details can be provided on request.

Information supplied by the client. This information can have an impact on the validity of results.

Samples are tested as received and the results relate only to the sample tested.

Analysis date is reported as the start date of extraction for a method.

The results may not be reproduced except in full, without a written approval from the laboratory.

Eurofins General Terms and Conditions apply.

END OF REPORT

Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

Accredited for compliance with ISO/IEC
 17025 - Testing
 NATA is a signatory to the ILAC Mutual
 Recognition Arrangement for the mutual
 recognition of the equivalence of testing,
 medical testing, calibration, inspection,
 proficiency testing scheme providers and
 reference materials producers reports and
 certificates.
 Accreditation Number 20293





mgt

Sydney
 Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
 Phone: +612 9900 8400
 Email: enviro.syd@mgflabmark.com.au

Brisbane
 Unit 1-21 Smallwood Place, Murrarie
 Phone: +617 3902 4600
 Email: enviro.bns@mgflabmark.com.au

Melbourne
 2 Kingston Town Close, Oakleigh, VIC 3166
 Phone: +613 8564 5000 Fax: +613 8564 5090
 Email: enquiries.melb@mgflabmark.com.au

CHAIN OF CUSTODY RECORD

Page 1 of 1

CLIENT DETAILS		Contact Name: Lachlan Parkinson		Purchase Order: 12552139	COC Number:
Company Name: GHD		Project Manager: Leslie Maranciak		PROJECT Number: 12552139	Eurofins | mgt quote ID: 180501GHD
Office Address: L3, 24 Honeysuckle Drive Newcastle 2300		Email for results: Lachlan.Parkinson@ghd.com Leslie.Maranciak@ghd.com		PROJECT Name: Aurizon Hexham Water Monitoring	Data output format: ESDAT

Special Directions & Comments: Please ensure fecal coliforms are reported in CFU/100ml	Analytes				Some common holding times with correct preservation For further information contact the lab			
					Waters		Soils	
					BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
					TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
					Heavy Metals	6 months	Heavy Metals	6 months
					Mercury, CrVI	28 days	Mercury, CrVI	28 days
					Microbiological testing	24 hours	Microbiological testing	72 hours
					BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
					Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
					Ferrous iron	7 days	ASLP, TCLP	7 days

Sample ID	Date	Matrix	B4 (BTEXN / TRH / PAH)	Dissolved Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	Suite B19A (Nutrients, Total N (TKN, NOX), Total P)	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day	Containers:							Sample comments:	
										1LP	250P	125P	1LA	40mL vial	125mL A	Jar		
1																		
2																		
3	MW101R	7/04/2022	W	X	X	X	X	X	X									
4																		
5	MW108R	7/04/2022	W	X	X	X	X	X	X									
6	MW109	7/04/2022	W	X	X	X	X	X	X									
7																		
8																		
9	MW307R	7/04/2022	W	X	X	X	X	X	X									
10	MW308R	7/04/2022	W	X	X	X	X	X	X									
11																		
12																		
13																		
14	RB02	7/04/2022	W	X	X			X										
15																		
16																		
17																		

Relinquished By: L.parkinson	Received By: <i>ER</i>	Turn around time		Method Of Shipment	Temperature on arrival:
Date & Time: 7/4/2022	Date & Time: 7.4.22 2.59pm	1 DAY <input type="checkbox"/>	2 DAY <input type="checkbox"/>	3 DAY <input type="checkbox"/>	11.7
Signature: <i>[Signature]</i>	Signature: <i>[Signature]</i>	5 DAY <input checked="" type="checkbox"/>	10 DAY <input type="checkbox"/>	Other: <input type="checkbox"/>	Report number: 878796
				<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal Courier Consignment #:	<i>EF 8/4/22</i> <i>[Signature]</i>

CERTIFICATE OF ANALYSIS

Work Order	: EM2205559	Page	: 1 of 6
Client	: GHD PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: Leslie Maranciak	Contact	: Shirley LeCornu
Address	: Level 3, GHD Tower, 24 Honeysuckle Drive Newcastle 2300	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9630
Project	: 12552139	Date Samples Received	: 29-Mar-2022 09:45
Order number	: 12552139	Date Analysis Commenced	: 30-Mar-2022
C-O-C number	: ----	Issue Date	: 05-Apr-2022 20:53
Sampler	: LP		
Site	: ----		
Quote number	: ME/875/20 B - SECONDARY WORK ONLY		
No. of samples received	: 1		
No. of samples analysed	: 1		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Jarwis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	FD02	----	----	----	----
Sampling date / time			24-Mar-2022 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	EM2205559-001	-----	-----	-----	-----
				Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.06	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	0.002	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	0.004	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.004	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	0.028	----	----	----	----
Iron	7439-89-6	0.05	mg/L	4.23	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.23	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.04	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.04	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.3	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	1.3	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.31	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FD02	----	----	----	----
Sampling date / time				24-Mar-2022 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	EM2205559-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----	
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----	
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----	
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----	
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----	
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----	
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----	
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----	
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----	
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----	
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	----	----	----	----	
Toluene	108-88-3	2	µg/L	<2	----	----	----	----	
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----	
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----	
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----	
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----	
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FD02	----	----	----	----
Sampling date / time				24-Mar-2022 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	EM2205559-001	-----	-----	-----	-----	
Result				----	----	----	----		
EP080: BTEXN - Continued									
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%	13.9	----	----	----	----	
2-Chlorophenol-D4	93951-73-6	1.0	%	54.4	----	----	----	----	
2,4,6-Tribromophenol	118-79-6	1.0	%	78.1	----	----	----	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%	77.8	----	----	----	----	
Anthracene-d10	1719-06-8	1.0	%	79.0	----	----	----	----	
4-Terphenyl-d14	1718-51-0	1.0	%	76.6	----	----	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%	96.4	----	----	----	----	
Toluene-D8	2037-26-5	2	%	86.5	----	----	----	----	
4-Bromofluorobenzene	460-00-4	2	%	93.9	----	----	----	----	



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	51
2-Chlorophenol-D4	93951-73-6	30	114
2,4,6-Tribromophenol	118-79-6	26	133
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	35	127
Anthracene-d10	1719-06-8	44	122
4-Terphenyl-d14	1718-51-0	44	124
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

QUALITY CONTROL REPORT

Work Order	: EM2205559	Page	: 1 of 6
Client	: GHD PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: Leslie Maranciak	Contact	: Shirley LeCornu
Address	: Level 3, GHD Tower, 24 Honeysuckle Drive Newcastle 2300	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9630
Project	: 12552139	Date Samples Received	: 29-Mar-2022
Order number	: 12552139	Date Analysis Commenced	: 30-Mar-2022
C-O-C number	: ----	Issue Date	: 05-Apr-2022
Sampler	: LP		
Site	: ----		
Quote number	: ME/875/20 B - SECONDARY WORK ONLY		
No. of samples received	: 1		
No. of samples analysed	: 1		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Jarwis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4261631)									
EM2205342-009	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0002	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.005	0.006	17.3	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.015	0.017	10.7	0% - 50%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.952	1.08	12.2	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.037	0.043	15.6	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2205544-005	Anonymous	EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.061	0.071	15.9	0% - 50%
EM2205511-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EM2205667-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4259961)									
EM2205517-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1.69	1.68	0.0	0% - 20%
EM2205544-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.15	0.16	0.0	0% - 50%



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4257651)										
EM2205545-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.03	0.03	0.0	No Limit	
EM2205546-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4259962)										
EM2205517-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.08	0.08	0.0	No Limit	
EM2205544-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.01	0.01	0.0	No Limit	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4259806)										
EM2205517-005	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	0.8	0.0	No Limit	
EM2205570-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	676	776	13.8	0% - 20%	
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4259805)										
EM2205517-005	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.07	0.06	23.8	No Limit	
EM2205497-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.05	0.03	49.5	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4258232)										
EM2205572-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
EM2205572-007	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4258232)										
EM2205572-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
EM2205572-007	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
EP080: BTEXN (QC Lot: 4258232)										
EM2205572-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
EM2205572-007	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit			
EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit			



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EG020F: Dissolved Metals by ICP-MS (QCLot: 4261631)									
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	95.2	90.4	111	
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	101	89.0	111	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.4	83.5	111	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.9	83.2	109	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.8	83.1	107	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	100	84.6	108	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	100	84.3	110	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	97.3	86.3	112	
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.1	91.8	112	
EG035F: Dissolved Mercury by FIMS (QCLot: 4261633)									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	107	71.6	116	
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4259961)									
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	100	84.1	116	
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4257651)									
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	98.3	90.9	112	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4259962)									
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	108	90.0	117	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4259806)									
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	92.2	70.0	117	
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4259805)									
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	82.6	71.9	114	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4257868)									
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	60.0	42.8	114	
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	72.9	48.6	119	
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	74.8	47.0	117	
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	74.4	49.5	119	
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	70.8	49.4	121	
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	69.6	48.4	122	
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	73.5	50.3	124	
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	74.0	50.0	126	
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	72.7	49.4	127	
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	73.6	48.7	126	



Sub-Matrix: WATER

Method: Compound				CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report		
								Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4257868) - continued										
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	1	µg/L	<1.0	5 µg/L	67.3	54.5	134		
	205-82-3									
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	69.9	56.1	134		
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	71.2	55.6	135		
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	72.2	54.4	126		
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	72.5	54.5	126		
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	72.6	54.4	126		
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4257867)										
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4000 µg/L	68.0	47.2	122		
EP071: C15 - C28 Fraction	----	100	µg/L	<100	16900 µg/L	75.5	52.9	131		
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8090 µg/L	73.3	50.4	127		
EP071: C10 - C36 Fraction (sum)	----	50	µg/L	<50	28990 µg/L	74.0	51.5	128		
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4258232)										
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	100	66.2	134		
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4257867)										
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5830 µg/L	67.5	49.1	125		
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	21700 µg/L	73.9	51.6	128		
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1560 µg/L	71.6	47.2	130		
EP071: >C10 - C40 Fraction (sum)	----	100	µg/L	<100	29090 µg/L	72.4	51.2	127		
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4258232)										
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	106	66.2	132		
EP080: BTEXN (QCLot: 4258232)										
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	106	68.8	127		
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	106	72.9	129		
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	107	71.7	130		
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	40 µg/L	115	72.3	136		
	106-42-3									
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	113	75.9	134		
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	100	68.3	131		

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER

Laboratory sample ID				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Acceptable Limits (%) Low High	
EG020F: Dissolved Metals by ICP-MS (QCLot: 4261631)							



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 4261631) - continued							
EM2205342-009	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	104	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	85.5	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	80.3	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	82.3	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	84.9	75.0	133
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	# Not Determined	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	95.0	75.0	131
EG035F: Dissolved Mercury by FIMS (QCLot: 4261633)							
EM2205511-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	103	70.0	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4259961)							
EM2205517-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	111	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4257651)							
EM2205545-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	81.8	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4259962)							
EM2205517-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	104	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4259806)							
EM2205517-006	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	109	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4259805)							
EM2205497-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	105	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4258232)							
EM2205572-002	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	72.8	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4258232)							
EM2205572-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	66.3	34.0	122
EP080: BTEXN (QCLot: 4258232)							
EM2205572-002	Anonymous	EP080: Benzene	71-43-2	20 µg/L	95.8	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	92.1	60.4	132

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM2205559	Page	: 1 of 7
Client	: GHD PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: Leslie Maranciak	Telephone	: +6138549 9630
Project	: 12552139	Date Samples Received	: 29-Mar-2022
Site	: ----	Issue Date	: 05-Apr-2022
Sampler	: LP	No. of samples received	: 1
Order number	: 12552139	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG020F: Dissolved Metals by ICP-MS	EM2205342--009	Anonymous	Nickel	7440-02-0	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural FD02	----	----	----	30-Mar-2022	26-Mar-2022	4

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	4	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatle Fraction	0	16	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	4	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatle Fraction	0	16	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for **VOC in soils** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) FD02	24-Mar-2022	----	----	----	01-Apr-2022	20-Sep-2022	✓



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) FD02	24-Mar-2022	----	----	----	04-Apr-2022	21-Apr-2022	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) FD02	24-Mar-2022	----	----	----	01-Apr-2022	21-Apr-2022	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) FD02	24-Mar-2022	----	----	----	30-Mar-2022	26-Mar-2022	*
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) FD02	24-Mar-2022	----	----	----	31-Mar-2022	21-Apr-2022	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) FD02	24-Mar-2022	01-Apr-2022	21-Apr-2022	✓	01-Apr-2022	21-Apr-2022	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) FD02	24-Mar-2022	01-Apr-2022	21-Apr-2022	✓	01-Apr-2022	21-Apr-2022	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) FD02	24-Mar-2022	31-Mar-2022	31-Mar-2022	✓	31-Mar-2022	10-May-2022	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) FD02	24-Mar-2022	31-Mar-2022	31-Mar-2022	✓	31-Mar-2022	10-May-2022	✓
Clear glass VOC vial - HCl (EP080) FD02	24-Mar-2022	30-Mar-2022	07-Apr-2022	✓	31-Mar-2022	07-Apr-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) FD02	24-Mar-2022	31-Mar-2022	31-Mar-2022	✓	31-Mar-2022	10-May-2022	✓
Clear glass VOC vial - HCl (EP080) FD02	24-Mar-2022	30-Mar-2022	07-Apr-2022	✓	31-Mar-2022	07-Apr-2022	✓
EP080: BTEXN							
Clear glass VOC vial - HCl (EP080) FD02	24-Mar-2022	30-Mar-2022	07-Apr-2022	✓	31-Mar-2022	07-Apr-2022	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	10	20.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	13	15.38	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	8	25.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	4	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	16	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							
Matrix Spikes (MS) - Continued							
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	4	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	16	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH ₃ G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO ₂ - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NO _x) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatle Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)



<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.



CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name: GHD Contact Name: Lachlan Parkinson Purchase Order: 12552139 Page: of

Office Address: L3, 24 Honeysuckle Drive Project Manager: Leslie Maranciak PROJECT Number: 12552139 COC Number:

Newcastle 2300 Email for results: Lachlan.Parkinson@ghd.com, Leslie.Maranciak@ghd.com PROJECT Name: Aurizon Hexham Water Monitoring Eurofins | mgt quote ID: 180501GHD

Data output format: ESQAT

COPY

Special Directions & Comments: Please ensure fecal coliforms are reported in CFU/100ml

Some common holding times (with correct preservation). For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Sample ID	Date	Matrix	B4 (BTEXN / TRH / PAH)	Dissolved Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	Sulfate B79A (Nutrients: Total N (TKN), NOX), Total P	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day	Total Metals (As, Pb, Cd, Cr, Cu, Fe, Ni, Zn)	Send to ALS - same analysis as F01 at ALS please	Containers:								Sample comments:	
												1LP	250P	125P	1LA	40mL vial	125mL A	Jar			
1 MW01R		W	X	X	X	X	X	X	X												
2 101R		W	X	X	X	X	X	X	X												
3 MW01R		W	X	X	X	X	X	X	X												
4 MW100R		W	X	X	X	X	X	X	X												
5 MW100R		W	X	X	X	X	X	X	X												
6 MW400		W	X	X	X	X	X	X	X												
7 MW301R		W	X	X	X	X	X	X	X												
8 MW02		W	X	X	X	X	X	X	X												
9 MW007R		W	X	X	X	X	X	X	X												
10 MW000R		W	X	X	X	X	X	X	X												
11 MW302R		W	X	X	X	X	X	X	X												
12 FD01		W	X	X			X	X	X												
13 FD02		W	X	X			X	X	X												
14 RB01		W	X	X			X	X	X												X
15 B01			X	X			X	X	X												
16 B02			X	X			X	X	X												
17																					

Environmental Division
Melbourne
Work Order Reference
EM2205559



Telephone: +61-3-8549 9800

Relinquished By: L. Parkinson Received By: [Signature] Laboratory Staff

Date & Time: 24/3/22 Date & Time: 24-3-22 3pm Turn around time

Signature: [Signature] Signature: [Signature]

Method of Shipment: Courier Hand Delivered Postal Temperature on arrival: 12.2

Courier Consignment #: Emily D Report number: 29/03/22 8:00am

Rec. by Scott [Signature]
29/3/22, 945

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **Lachlan Parkinson**

Report **893252-W-V3**
Project name **AURIZON HEXHAM WATER MONITORING**
Project ID **12552139**
Received Date **May 30, 2022**

Client Sample ID			SW1	SW2	SW3	G01SW4
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22-My0074638	M22-My0074639	M22-My0074640	M22-My0074641
Date Sampled			May 30, 2022	May 30, 2022	May 30, 2022	May 30, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.04
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.02
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.04
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.04
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.002
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.002
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.002
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.004
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.002
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.006
4-Bromofluorobenzene (surr.)	1	%	86	92	93	87
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID Sample Matrix			SW1 Water M22-My0074638 May 30, 2022	SW2 Water M22-My0074639 May 30, 2022	SW3 Water M22-My0074640 May 30, 2022	G01 SW4 Water M22-My0074641 May 30, 2022
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	58	51	53	59
p-Terphenyl-d14 (surr.)	1	%	112	103	51	137
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	0.06	0.03	0.09	0.14
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	< 5	< 5	9.1
Conductivity (at 25°C)						
Conductivity (at 25°C)	10	uS/cm	510	530	1100	2600
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	7.8	7.5	7.2	7.1
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.23	0.34	3.0	3.8
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	2.2	2.4	3.0	16
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	2.2	2.4	3	16
Total Suspended Solids Dried at 103°C–105°C						
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	20	17	130	970
Turbidity						
Turbidity	1	NTU	16	15	23	1000
Heavy Metals						
Aluminium	0.05	mg/L	0.62	0.59	0.88	1.2
Arsenic	0.001	mg/L	0.001	< 0.001	0.001	0.038
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.001
Chromium	0.001	mg/L	< 0.001	0.002	< 0.001	< 0.01
Copper	0.001	mg/L	0.001	0.002	0.001	< 0.01
Iron	0.05	mg/L	1.8	1.7	1.9	290
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.01
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.001
Nickel	0.001	mg/L	0.003	0.003	0.003	0.012
Zinc	0.005	mg/L	0.006	0.006	0.005	0.051
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID Sample Matrix			G01 SW4A Water M22-My0074642 May 30, 2022	G01 SW5 Water M22-My0074643 May 30, 2022	SW6 Water M22-My0074644 May 30, 2022	G01 SW7 Water M22-My0074645 May 30, 2022
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.04	< 0.04	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	0.10	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	0.1	< 0.1	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.02	< 0.02	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.04	< 0.04	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.04	< 0.04	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			G01 SW4A	G01 SW5	SW6	G01 SW7
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22-My0074642	M22-My0074643	M22-My0074644	M22-My0074645
Date Sampled			May 30, 2022	May 30, 2022	May 30, 2022	May 30, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.002	< 0.002	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.002	< 0.002	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.002	< 0.002	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.004	< 0.004	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.002	< 0.002	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.006	< 0.006	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	72	86	89	87
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	79	72	99	57
p-Terphenyl-d14 (surr.)	1	%	123	79	109	127
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	0.17	0.90	0.09	^{R09} 0.57
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	5.7	26	< 5	< 5
Conductivity (at 25°C)						
Conductivity (at 25°C)	10	uS/cm	2400	1900	2100	2200
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.5	< 0.05	< 0.5
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	7.7	6.5	7.4	6.9
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	4.2	6.0	0.59	0.86
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	6.8	27	< 0.2	^{R09} < 0.2
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	6.8	27	< 0.2	< 0.5
Total Suspended Solids Dried at 103°C–105°C						
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	170	4200	77	200
Turbidity						
Turbidity	1	NTU	210	26000	180	680
Heavy Metals						
Aluminium	0.05	mg/L	1.7	3.8	0.11	0.77
Arsenic	0.001	mg/L	0.039	0.19	0.002	0.012
Cadmium	0.0002	mg/L	< 0.001	< 0.001	< 0.0002	< 0.001
Chromium	0.001	mg/L	< 0.01	< 0.01	< 0.001	< 0.01
Copper	0.001	mg/L	< 0.01	0.049	0.002	< 0.01

Client Sample ID			G01 SW4A	G01 SW5	SW6	G01 SW7
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22-My0074642	M22-My0074643	M22-My0074644	M22-My0074645
Date Sampled			May 30, 2022	May 30, 2022	May 30, 2022	May 30, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Iron	0.05	mg/L	330	970	30	130
Lead	0.001	mg/L	< 0.01	0.012	< 0.001	< 0.01
Mercury	0.0001	mg/L	< 0.001	< 0.001	< 0.0001	< 0.001
Nickel	0.001	mg/L	0.013	0.23	0.004	0.032
Zinc	0.005	mg/L	0.044	0.40	0.006	0.075
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			SW9	SW11	BASIN 1	BASIN 2
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22-My0074646	M22-My0074647	M22-My0074648	M22-My0074649
Date Sampled			May 30, 2022	May 30, 2022	May 30, 2022	May 30, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	90	92	95	78
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			SW9	SW11	BASIN 1	BASIN 2
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22-My0074646	M22-My0074647	M22-My0074648	M22-My0074649
Date Sampled			May 30, 2022	May 30, 2022	May 30, 2022	May 30, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	82	71	91	113
p-Terphenyl-d14 (surr.)	1	%	91	59	93	99
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	^{R09} 0.37	0.03	0.08	0.01
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	< 5	< 5	< 5
Conductivity (at 25°C)	10	uS/cm	29000	530	890	1300
Nitrate & Nitrite (as N)	0.05	mg/L	0.14	< 0.05	0.06	< 0.05
pH (at 25 °C)	0.1	pH Units	7.9	7.5	7.8	7.8
Phosphate total (as P)	0.01	mg/L	0.42	0.17	0.48	0.33
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	^{R09} < 0.2	0.5	0.3	< 0.2
Total Nitrogen (as N)*	0.2	mg/L	< 0.2	0.5	0.36	< 0.2
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	5.5	12	< 5	56
Turbidity	1	NTU	8.9	15	2.6	1.2
Heavy Metals						
Aluminium	0.05	mg/L	0.06	0.73	< 0.05	< 0.05
Arsenic	0.001	mg/L	0.002	< 0.001	0.002	0.001
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	0.001	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	0.001	< 0.001	< 0.001
Iron	0.05	mg/L	1.1	2.0	0.14	0.41
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	< 0.001	0.003	< 0.001	0.005
Zinc	0.005	mg/L	< 0.005	0.007	< 0.005	< 0.005
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			BASIN 3
Sample Matrix			Water
Eurofins Sample No.			M22-My0074650
Date Sampled			May 30, 2022
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02

Client Sample ID			BASIN 3
Sample Matrix			Water
Eurofins Sample No.			M22-My0074650
Date Sampled			May 30, 2022
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	86
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	68
p-Terphenyl-d14 (surr.)	1	%	70
Ammonia (as N)			
Ammonia (as N)	0.01	mg/L	0.12
Biochemical Oxygen Demand (BOD-5 Day)			
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5
Conductivity (at 25°C)			
Conductivity (at 25°C)	10	uS/cm	1700
Nitrate & Nitrite (as N)			
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05
pH (at 25 °C)			
pH (at 25 °C)	0.1	pH Units	7.0
Phosphate total (as P)			
Phosphate total (as P)	0.01	mg/L	0.23
Total Kjeldahl Nitrogen (as N)			
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	0.5
Total Nitrogen (as N)*			
Total Nitrogen (as N)*	0.2	mg/L	0.5
Total Suspended Solids Dried at 103°C–105°C			
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	7.5
Turbidity			
Turbidity	1	NTU	32

Client Sample ID			BASIN 3
Sample Matrix			Water
Eurofins Sample No.			M22-My0074650
Date Sampled			May 30, 2022
Test/Reference	LOR	Unit	
Heavy Metals			
Aluminium	0.05	mg/L	< 0.05
Arsenic	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Copper	0.001	mg/L	< 0.001
Iron	0.05	mg/L	4.6
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	0.010
Zinc	0.005	mg/L	< 0.005
Pathogens			
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	May 31, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	May 31, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	May 31, 2022	7 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Melbourne	May 31, 2022	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	May 31, 2022	7 Days
Ammonia (as N) - Method: APHA 4500-NH3 Ammonia Nitrogen by FIA	Melbourne	May 31, 2022	28 Days
Biochemical Oxygen Demand (BOD-5 Day) - Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water	Melbourne	May 31, 2022	2 Days
Conductivity (at 25°C) - Method: LTM-INO-4030 Conductivity	Melbourne	May 31, 2022	28 Days
pH (at 25 °C) - Method: LTM-GEN-7090 pH in water by ISE	Melbourne	May 31, 2022	0 Hours
Total Suspended Solids Dried at 103°C–105°C - Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry	Melbourne	May 31, 2022	7 Days
Turbidity - Method: Turbidity by classical using APHA 2130B (LTM-INO-4140)	Melbourne	Jun 01, 2022	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	May 31, 2022	28 Days
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N) - Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA	Melbourne	May 31, 2022	28 Days
Total Kjeldahl Nitrogen (as N) - Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA	Melbourne	May 31, 2022	28 Days
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphate total (as P) - Method: LTM-INO-4040 Phosphate by CFA	Melbourne	May 31, 2022	28 Days

ABN: 50 005 085 521

ABN: 91 05 0159 898

NZBN: 9429046024954

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261 Site # 1254

Sydney
179 Magowar Road
Girraween NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

Perth
46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 6253 4444
NATA # 2377 Site # 2370

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Company Name:	GHD Pty Ltd NEWCASTLE	Order No.:		Received:	May 30, 2022 1:45 PM
Address:	3/24 Honeysuckle Dve Newcastle NSW 2300	Report #:	893252	Due:	Jun 6, 2022
Project Name:	AURIZON HEXHAM WATER MONITORING	Phone:	02 4979 9999	Priority:	5 Day
Project ID:	12552139	Fax:	02 4979 9988	Contact Name:	Lachlan Parkinson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Ammonia (as N)	Arsenic	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Chromium	Conductivity (at 25°C)	Copper	Iron	Lead	Mercury	Nickel	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103°C-105°C	Turbidity	Zinc	Eurofins Suite B4	Eurofins Suite B19A- Total N (TKN, NOx), Total P
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																								
Brisbane Laboratory - NATA # 1261 Site # 20794																								
Mayfield Laboratory - NATA # 1261 Site # 25079																								
Perth Laboratory - NATA # 2377 Site # 2370																								
External Laboratory																		X						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																			
1	SW1	May 30, 2022		Water	M22-My0074638	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	SW2	May 30, 2022		Water	M22-My0074639	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	SW3	May 30, 2022		Water	M22-My0074640	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	SW4	May 30, 2022		Water	M22-My0074641	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	SW4A	May 30, 2022		Water	M22-My0074642	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	SW5	May 30, 2022		Water	M22-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.:
Report #: 893252
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: May 30, 2022 1:45 PM
Due: Jun 6, 2022
Priority: 5 Day
Contact Name: Lachlan Parkinson

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12552139

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Ammonia (as N)	Arsenic	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Chromium	Conductivity (at 25°C)	Copper	Iron	Lead	Mercury	Nickel	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103°C-105°C	Turbidity	Zinc	Eurofins Suite B4	Eurofins Suite B19A- Total N (TKN, NOx), Total P
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																								
Brisbane Laboratory - NATA # 1261 Site # 20794																								
Mayfield Laboratory - NATA # 1261 Site # 25079																								
Perth Laboratory - NATA # 2377 Site # 2370																								
External Laboratory																		X						
					My0074643																			
7	SW6	May 30, 2022		Water	M22-My0074644	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8	SW7	May 30, 2022		Water	M22-My0074645	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
9	SW9	May 30, 2022		Water	M22-My0074646	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10	SW11	May 30, 2022		Water	M22-My0074647	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
11	BASIN 1	May 30, 2022		Water	M22-My0074648	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12	BASIN 2	May 30, 2022		Water	M22-My0074649	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Company Name:	GHD Pty Ltd NEWCASTLE	Order No.:		Received:	May 30, 2022 1:45 PM
Address:	3/24 Honeysuckle Dve Newcastle NSW 2300	Report #:	893252	Due:	Jun 6, 2022
Project Name:	AURIZON HEXHAM WATER MONITORING	Phone:	02 4979 9999	Priority:	5 Day
Project ID:	12552139	Fax:	02 4979 9988	Contact Name:	Lachlan Parkinson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Ammonia (as N)	Arsenic	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Chromium	Conductivity (at 25°C)	Copper	Iron	Lead	Mercury	Nickel	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103°C-105°C	Turbidity	Zinc	Eurofins Suite B4	Eurofins Suite B19A- Total N (TKN, NOx), Total P
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																								
Brisbane Laboratory - NATA # 1261 Site # 20794																								
Mayfield Laboratory - NATA # 1261 Site # 25079																								
Perth Laboratory - NATA # 2377 Site # 2370																								
External Laboratory																		X						
13	BASIN 3	May 30, 2022		Water	M22-My0074650	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Turbidity	NTU	< 1			1	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	108			70-130	Pass	
TRH C10-C14	%	109			70-130	Pass	
Naphthalene	%	83			70-130	Pass	
TRH C6-C10	%	108			70-130	Pass	
TRH >C10-C16	%	112			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	90			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
Toluene	%	88			70-130	Pass		
Ethylbenzene	%	87			70-130	Pass		
m&p-Xylenes	%	88			70-130	Pass		
Xylenes - Total*	%	95			70-130	Pass		
LCS - % Recovery								
Polycyclic Aromatic Hydrocarbons								
Acenaphthene	%	115			70-130	Pass		
Acenaphthylene	%	96			70-130	Pass		
Benz(a)anthracene	%	95			70-130	Pass		
Benzo(b&j)fluoranthene	%	85			70-130	Pass		
Benzo(g,h,i)perylene	%	88			70-130	Pass		
Benzo(k)fluoranthene	%	105			70-130	Pass		
Chrysene	%	129			70-130	Pass		
Dibenz(a,h)anthracene	%	80			70-130	Pass		
Fluoranthene	%	93			70-130	Pass		
Fluorene	%	113			70-130	Pass		
Indeno(1,2,3-cd)pyrene	%	87			70-130	Pass		
Naphthalene	%	76			70-130	Pass		
Phenanthrene	%	117			70-130	Pass		
Pyrene	%	98			70-130	Pass		
LCS - % Recovery								
Ammonia (as N)	%	102			70-130	Pass		
Nitrate & Nitrite (as N)	%	93			70-130	Pass		
Total Kjeldahl Nitrogen (as N)	%	85			70-130	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Total Recoverable Hydrocarbons				Result 1				
TRH C6-C9	M22-My0073082	NCP	%	126		70-130	Pass	
TRH C10-C14	M22-My0075937	NCP	%	124		70-130	Pass	
Naphthalene	M22-My0073082	NCP	%	91		70-130	Pass	
TRH C6-C10	M22-My0073082	NCP	%	122		70-130	Pass	
TRH >C10-C16	M22-My0075937	NCP	%	127		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	M22-My0073082	NCP	%	102		70-130	Pass	
Toluene	M22-My0073082	NCP	%	118		70-130	Pass	
Ethylbenzene	M22-My0073082	NCP	%	105		70-130	Pass	
m&p-Xylenes	M22-My0073082	NCP	%	104		70-130	Pass	
o-Xylene	M22-My0073082	NCP	%	104		70-130	Pass	
Xylenes - Total*	M22-My0073082	NCP	%	104		70-130	Pass	
Spike - % Recovery								
				Result 1				
Total Suspended Solids Dried at 103°C-105°C	M22-My0074217	NCP	%	50		70-130	Fail	Q08
Spike - % Recovery								
				Result 1				
Total Kjeldahl Nitrogen (as N)	M22-My0074643	CP	%	76		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Aluminium	M22-My0074644	CP	%	94		75-125	Pass	
Arsenic	M22-My0074644	CP	%	96		75-125	Pass	
Cadmium	M22-My0074644	CP	%	102		75-125	Pass	
Chromium	M22-My0074644	CP	%	93		75-125	Pass	
Copper	M22-My0074644	CP	%	93		75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead	M22-My0074644	CP	%	113			75-125	Pass	
Mercury	M22-My0074644	CP	%	93			75-125	Pass	
Nickel	M22-My0074644	CP	%	91			75-125	Pass	
Zinc	M22-My0074644	CP	%	106			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	B22-My0068853	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M22-Jn0001610	NCP	mg/L	0.48	0.47	2.0	30%	Pass	
TRH C15-C28	M22-Jn0001610	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M22-Jn0001610	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Naphthalene	B22-My0068853	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	B22-My0068853	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	M22-Jn0001610	NCP	mg/L	0.22	0.20	8.0	30%	Pass	
TRH >C16-C34	M22-Jn0001610	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M22-Jn0001610	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B22-My0068853	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	B22-My0068853	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	B22-My0068853	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	B22-My0068853	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	B22-My0068853	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	B22-My0068853	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&i)fluoranthene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g,h,i)perylene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a,h)anthracene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	K22-My0018554	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	M22-My0075339	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Conductivity (at 25°C)	S22-My0069765	NCP	uS/cm	5100	5200	1.0	30%	Pass	
Nitrate & Nitrite (as N)	M22-My0075339	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
pH (at 25 °C)	S22-My0069765	NCP	pH Units	8.2	8.2	pass	30%	Pass	
Total Suspended Solids Dried at 103°C–105°C	M22-My0074482	NCP	mg/L	7.2	13	59	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
Total Kjeldahl Nitrogen (as N)	M22-My0074639	CP	mg/L	2.4	1.8	29	30%	Pass	

Duplicate				Result 1	Result 2	RPD		
Phosphate total (as P)	M22-My0074640	CP	mg/L	3.0	3.4	10	30%	Pass
Total Kjeldahl Nitrogen (as N)	M22-My0074640	CP	mg/L	3.0	2.5	17	30%	Pass
Duplicate				Result 1	Result 2	RPD		
Total Kjeldahl Nitrogen (as N)	M22-My0074641	CP	mg/L	16	17	<1	30%	Pass
Duplicate				Result 1	Result 2	RPD		
Total Kjeldahl Nitrogen (as N)	M22-My0074642	CP	mg/L	6.8	5.7	17	30%	Pass
Turbidity	M22-My0074642	CP	NTU	210	210	1.0	30%	Pass
Duplicate				Result 1	Result 2	RPD		
Heavy Metals				Result 1	Result 2	RPD		
Aluminium	M22-My0074644	CP	mg/L	0.11	0.12	11	30%	Pass
Arsenic	M22-My0074644	CP	mg/L	0.002	0.002	7.0	30%	Pass
Cadmium	M22-My0074644	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium	M22-My0074644	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper	M22-My0074644	CP	mg/L	0.002	0.002	5.0	30%	Pass
Iron	M22-My0074644	CP	mg/L	30	30	<1	30%	Pass
Lead	M22-My0074644	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury	M22-My0074644	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	M22-My0074644	CP	mg/L	0.004	0.004	2.0	30%	Pass
Zinc	M22-My0074644	CP	mg/L	0.006	0.007	24	30%	Pass
Duplicate				Result 1	Result 2	RPD		
Biochemical Oxygen Demand (BOD-5 Day)	M22-My0074645	CP	mg/L	< 5	< 5	<1	30%	Pass
Total Kjeldahl Nitrogen (as N)	M22-My0074645	CP	mg/L	< 0.2	< 0.2	<1	30%	Pass
Duplicate				Result 1	Result 2	RPD		
Biochemical Oxygen Demand (BOD-5 Day)	M22-My0074647	CP	mg/L	< 5	< 5	<1	30%	Pass

Comments

Thermotolerant coliforms analysed by; Eurofins Food Testing; accreditation number 20293; report reference AR-22-NV-006959-01

V2- new version to update the sampling date as per client request.

V3 - New Version created to add Matrix Interference qualifiers.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
G01	The LORs have been raised due to matrix interference
I12	Where sampling date has not been provided, Eurofins | Environment Testing is not able to determine whether analysis has been performed within recommended holding times.
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
R09	Theoretically the TKN result should be greater or equal to the ammonia concentration. However the difference reported is within the measurement uncertainty of the individual tests

Authorised by:

Quinn Raw	Analytical Services Manager
Caitlin Breeze	Senior Analyst-Inorganic
Edward Lee	Senior Analyst-Organic
Joseph Edouard	Senior Analyst-Organic
Joseph Edouard	Senior Analyst-Volatile
Mary Makarios	Senior Analyst-Inorganic
Mary Makarios	Senior Analyst-Metal
Mele Singh	Senior Analyst-Organic
Scott Beddoes	Senior Analyst-Inorganic
Scott Beddoes	Senior Analyst-Metal



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

ANALYTICAL REPORT

REPORT CODE

AR-22-NV-006959-01

REPORT DATE

02/06/2022

For the attention of

Eurofins Environment Testing Australia Pty Ltd

Analytical Reports

6 Monterey Road

Dandenong South

3175 Melbourne

AUSTRALIA

Phone +61 3 8564 5064

Email EnviroReportsau@eurofins.com



Contact for your orders: Ruvini Herath

Order code: EUAUTWU-00017882

Purchase Order Number: 893252

SAMPLE CODE
726-2022-00019459

Client Reference: 893252

Sample described as: MY-0074638

Reception Date: 31/05/2022

Analysis Starting Date: 01/06/2022

Reception temperature: 5.3 °C

Analysis Ending Date: 02/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 1/06/2022 14:00

Thermotolerant coliforms	700	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE
726-2022-00019460

Client Reference: 893252

Sample described as: MY-0074639

Reception Date: 31/05/2022

Analysis Starting Date: 01/06/2022

Reception temperature: 5.3 °C

Analysis Ending Date: 02/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 1/06/2022 14:00

Thermotolerant coliforms	1000	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE
726-2022-00019461

Client Reference: 893252

Sample described as: MY-0074640

Reception Date: 31/05/2022

Analysis Starting Date: 01/06/2022

Reception temperature: 5.3 °C

Analysis Ending Date: 02/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 1/06/2022 14:00

Thermotolerant coliforms	200	cfu/100 ml	1
--------------------------	-----	------------	---

Eurofins Food Testing Australia Pty Ltd

 6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

 Accredited for compliance with ISO/IEC
 17025 - Testing
 NATA is a signatory to the ILAC Mutual
 Recognition Arrangement for the mutual
 recognition of the equivalence of testing,
 medical testing, calibration, inspection,
 proficiency testing scheme providers and
 reference materials producers reports and
 certificates.
 Accreditation Number 20293


SAMPLE CODE 726-2022-00019462

Client Reference: 893252
Sample described as: MY-0074641
Reception Date: 31/05/2022
Analysis Starting Date: 01/06/2022

Reception temperature: 5.3 °C
Analysis Ending Date: 02/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 1/06/2022 14:00

Thermotolerant coliforms	2500	cfu/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE 726-2022-00019463

Client Reference: 893252
Sample described as: MY-0074642
Reception Date: 31/05/2022
Analysis Starting Date: 01/06/2022

Reception temperature: 5.3 °C
Analysis Ending Date: 02/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 1/06/2022 14:00

Thermotolerant coliforms	500	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE 726-2022-00019464

Client Reference: 893252
Sample described as: MY-0074643
Reception Date: 31/05/2022
Analysis Starting Date: 01/06/2022

Reception temperature: 5.3 °C
Analysis Ending Date: 02/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 1/06/2022 14:00

Thermotolerant coliforms	600	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE 726-2022-00019465

Client Reference: 893252
Sample described as: MY-0074644
Reception Date: 31/05/2022
Analysis Starting Date: 01/06/2022

Reception temperature: 5.3 °C
Analysis Ending Date: 02/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 1/06/2022 14:00

Thermotolerant coliforms	300	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE 726-2022-00019466

Client Reference: 893252
Sample described as: MY-0074645
Reception Date: 31/05/2022
Analysis Starting Date: 01/06/2022

Reception temperature: 5.3 °C
Analysis Ending Date: 02/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 1/06/2022 14:00

Thermotolerant coliforms	300	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE
726-2022-00019467
Client Reference: 893252

Sample described as: MY-0074646

Reception Date: 31/05/2022

Analysis Starting Date: 01/06/2022

Reception temperature: 5.3 °C

Analysis Ending Date: 02/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 1/06/2022 14:00

Thermotolerant coliforms	20	cfu/100 ml	1
--------------------------	----	------------	---

SAMPLE CODE
726-2022-00019468
Client Reference: 893252

Sample described as: MY-0074647

Reception Date: 31/05/2022

Analysis Starting Date: 01/06/2022

Reception temperature: 5.3 °C

Analysis Ending Date: 02/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 1/06/2022 14:00

Thermotolerant coliforms	100	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE
726-2022-00019469
Client Reference: 893252

Sample described as: MY-0074648

Reception Date: 31/05/2022

Analysis Starting Date: 01/06/2022

Reception temperature: 5.3 °C

Analysis Ending Date: 02/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 1/06/2022 14:00

Thermotolerant coliforms	300	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE
726-2022-00019470
Client Reference: 893252

Sample described as: MY-0074649

Reception Date: 31/05/2022

Analysis Starting Date: 01/06/2022

Reception temperature: 5.3 °C

Analysis Ending Date: 02/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 1/06/2022 14:00

Thermotolerant coliforms	200	cfu/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE 726-2022-00019471

Client Reference: 893252
Sample described as: MY-0074650
Reception Date: 31/05/2022
Analysis Starting Date: 01/06/2022

Reception temperature: 5.3 °C
Analysis Ending Date: 02/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 1/06/2022 14:00

Method	Result	Unit	LOQ
Thermotolerant coliforms	170	cfu/100 ml	1

LIST OF METHODS

 VQ792 **Thermotolerant Coliforms:** AS 4276.7

Signature
Di Shen Scientist

EXPLANATORY NOTE

- ◆ test is not accredited
- test is subcontracted within Eurofins group and is accredited
- test is subcontracted within Eurofins group and is not accredited
- test is subcontracted outside Eurofins group and is accredited
- test is subcontracted outside Eurofins group and is not accredited

N/A means Not applicable

Not Detected means not detected at or above the Limit of Quantification (LOQ)

LOQ Limit of Quantification

U Measurement Uncertainty

< Less than, ≤ Less than or equal to

> Greater than, ≥ Greater than or equal to

The tests are identified by a 5 digit code, full details can be provided on request.

Information supplied by the client. This information can have an impact on the validity of results.

Samples are tested as received and the results relate only to the sample tested.

Analysis date is reported as the start date of extraction for a method.

The results may not be reproduced except in full, without a written approval from the laboratory.

Eurofins General Terms and Conditions apply.

END OF REPORT
Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

Accredited for compliance with ISO/IEC 17025 - Testing

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Accreditation Number 20293



Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne 6 Monterey Road Dandenong South VIC 3175 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Geelong 19/8 Lewalan Street Grovedale VIC 3216 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Sydney 179 Magowar Road Girraween NSW 2145 Tel: +61 2 9900 8400 NATA# 1261 Site# 18217
---	---	--

Canberra Unit 1,2 Dacre Street Mitchell ACT 2911 Tel: +61 2 6113 8091	Brisbane 1/21 Smallwood Place Murarie QLD 4172 Tel: +61 7 3902 4600 NATA# 1261 Site# 20794	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Tel: +61 2 4968 8448 NATA# 1261 Site# 25079
--	--	---

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth 46-48 Banksia Road Welshpool WA 6106 Tel: +61 8 6253 4444 NATA# 2377 Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland 35 O'Rorke Road Penrose, Auckland 1061 Tel: +64 9 526 45 51 IANZ# 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Tel: 0800 856 450 IANZ# 1290
---	---

Sample Receipt Advice

Company name:	GHD Pty Ltd NEWCASTLE
Contact name:	Lachlan Parkinson
Project name:	AURIZON HEXHAM WATER MONITORING
Project ID:	12552139
Turnaround time:	5 Day
Date/Time received	May 30, 2022 1:45 PM
Eurofins reference	893252

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 16.2 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✓ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Lachlan Parkinson - lachlan.parkinson@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NEWCASTLE email address.

CHAIN OF CUSTODY RECORD

CLIENT DETAILS		Page 1 of 1
Company Name : GHD	Contact Name: Lachlan Parkinson	Purchase Order : 12552139
Office Address : L3, 24 Honeysuckle Drive Newcastle 2300	Project Manager : Leslie Maranciak	PROJECT Number : 12552139
	Email for results : Lachlan.Parkinson@ghd.com Leslie.Maranciak@ghd.com	PROJECT Name : Aurizon Hexham Water Monitoring
		COC Number : Eurofins | mgt quote ID : 180501GHD Data output format: ESDAT

Please ensure fecal coliforms are reported in CFU/100ml		Analytes										Some common holding times (with correct preservation). For further information contact the lab																																																							
		B4 (BTEXN / TRH / PAH)	Total Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	Suite B19A (Nutrients, Total N (TKN, NOX), Total P	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day					<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="3">Waters</th> <th colspan="3">Soils</th> </tr> <tr> <td>BTEX, MAH, VOC</td> <td>14 days</td> <td></td> <td>BTEX, MAH, VOC</td> <td>14 days</td> <td></td> </tr> <tr> <td>TRH, PAH, Phenols, Pesticides</td> <td>7 days</td> <td></td> <td>TRH, PAH, Phenols, Pesticides</td> <td>14 days</td> <td></td> </tr> <tr> <td>Heavy Metals</td> <td>6 months</td> <td></td> <td>Heavy Metals</td> <td>6 months</td> <td></td> </tr> <tr> <td>Mercury, CrVI</td> <td>28 days</td> <td></td> <td>Mercury, CrVI</td> <td>28 days</td> <td></td> </tr> <tr> <td>Microbiological testing</td> <td>24 hours</td> <td></td> <td>Microbiological testing</td> <td>72 hours</td> <td></td> </tr> <tr> <td>BOD, Nitrate, Nitrite, Total N</td> <td>2 days</td> <td></td> <td>Anions</td> <td>28 days</td> <td></td> </tr> <tr> <td>Solids - TSS, TDS etc</td> <td>7 days</td> <td></td> <td>SPOCAS, pH Field and FOX, CrS</td> <td>24 hours</td> <td></td> </tr> <tr> <td>Ferrous iron</td> <td>7 days</td> <td></td> <td>ASLP, TCLP</td> <td>7 days</td> <td></td> </tr> </table>			Waters			Soils			BTEX, MAH, VOC	14 days		BTEX, MAH, VOC	14 days		TRH, PAH, Phenols, Pesticides	7 days		TRH, PAH, Phenols, Pesticides	14 days		Heavy Metals	6 months		Heavy Metals	6 months		Mercury, CrVI	28 days		Mercury, CrVI	28 days		Microbiological testing	24 hours		Microbiological testing	72 hours		BOD, Nitrate, Nitrite, Total N	2 days		Anions	28 days		Solids - TSS, TDS etc	7 days		SPOCAS, pH Field and FOX, CrS	24 hours		Ferrous iron	7 days		ASLP, TCLP
Waters			Soils																																																																
BTEX, MAH, VOC	14 days		BTEX, MAH, VOC	14 days																																																															
TRH, PAH, Phenols, Pesticides	7 days		TRH, PAH, Phenols, Pesticides	14 days																																																															
Heavy Metals	6 months		Heavy Metals	6 months																																																															
Mercury, CrVI	28 days		Mercury, CrVI	28 days																																																															
Microbiological testing	24 hours		Microbiological testing	72 hours																																																															
BOD, Nitrate, Nitrite, Total N	2 days		Anions	28 days																																																															
Solids - TSS, TDS etc	7 days		SPOCAS, pH Field and FOX, CrS	24 hours																																																															
Ferrous iron	7 days		ASLP, TCLP	7 days																																																															
Eurofins mgt DI water batch number:														Containers: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>1LP</td> <td>250P</td> <td>125P</td> <td>1LA</td> <td>40m_val</td> <td>125mLA</td> <td>Jer</td> <td colspan="3">Sample comments:</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td colspan="3"></td> </tr> </table>						1LP	250P	125P	1LA	40m_val	125mLA	Jer	Sample comments:																																								
1LP	250P	125P	1LA	40m_val	125mLA	Jer	Sample comments:																																																												
Sample ID	Date	Matrix	B4	Total Metals	pH	Ammonia	Suite B19A	Thermotolerant Coliforms	BOD																																																										
1		W	X	X	X	X	X	X	X																																																										
2		W	X	X	X	X	X	X	X																																																										
3		W	X	X	X	X	X	X	X																																																										
4		W	X	X	X	X	X	X	X																																																										
5		W	X	X	X	X	X	X	X																																																										
6		W	X	X	X	X	X	X	X																																																										
7		W	X	X	X	X	X	X	X																																																										
8		W	X	X	X	X	X	X	X																																																										
9		W	X	X	X	X	X	X	X																																																										
10		W	X	X	X	X	X	X	X																																																										
11		W	X	X	X	X	X	X	X																																																										
12		W	X	X	X	X	X	X	X																																																										
13		W	X	X	X	X	X	X	X																																																										
14		W	X	X	X	X	X	X	X																																																										
15		W	X	X	X	X	X	X	X																																																										
16																																																																			
17																																																																			
18																																																																			
19																																																																			
20																																																																			

893252
Ty

Relinquished By: L.parkinson	Received By: <i>Jaidyn Slouy-ove</i>	Turn around time	Method Of Shipment	Temperature on arrival:
Date & Time: 30/5/2022	Date & Time: 30/05/22 1:45 PM	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/> 5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:	<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal Courier Consignment #:	16.2
Signature: <i>[Signature]</i>	Signature: <i>[Signature]</i>			Report number:

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **Leslie Maranciak**

Report **897967-W-V2**
Project name **AURIZON HEXHAM WATER MONITORING**
Project ID **12584780**
Received Date **Jun 15, 2022**

Client Sample ID			MW01R	101R	MW101R	MW106R
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Jn0035619	M22- Jn0035620	M22- Jn0035621	M22- Jn0035622
Date Sampled			Jun 15, 2022	Jun 15, 2022	Jun 15, 2022	Jun 15, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	79	94	98	97
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			MW01R	101R	MW101R	MW106R
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Jn0035619	M22- Jn0035620	M22- Jn0035621	M22- Jn0035622
Date Sampled			Jun 15, 2022	Jun 15, 2022	Jun 15, 2022	Jun 15, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	107	83	112	102
p-Terphenyl-d14 (surr.)	1	%	142	113	141	135
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	0.55	3.1	1.9	0.08
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	20	< 5	< 5	< 5
Conductivity (at 25°C)						
Conductivity (at 25°C)	10	uS/cm	5100	12000	20000	850
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	1.3
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	6.3	7.6	7.4	7.6
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.07	0.27	0.76	0.24
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	1.3	10	4.5	1.0
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	1.3	10	4.5	2.3
Total Suspended Solids Dried at 103°C–105°C						
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	39	450	73	72
Turbidity						
Turbidity	1	NTU	210	790	180	35
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	0.07	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	0.002	< 0.001	0.005	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	0.001	< 0.001	0.002
Iron (filtered)	0.05	mg/L	190	8.7	11	0.24
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.075	0.006	0.024	0.003
Zinc (filtered)	0.005	mg/L	0.012	< 0.005	0.013	0.013
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			MW108R	MW109	MW301R	MW02
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Jn0035623	M22- Jn0035624	M22- Jn0035625	M22- Jn0035626
Date Sampled			Jun 15, 2022	Jun 15, 2022	Jun 15, 2022	Jun 15, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			MW108R	MW109	MW301R	MW02
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Jn0035623	M22- Jn0035624	M22- Jn0035625	M22- Jn0035626
Date Sampled			Jun 15, 2022	Jun 15, 2022	Jun 15, 2022	Jun 15, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	92	96	96	96
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	134	82	107	76
p-Terphenyl-d14 (surr.)	1	%	121	84	116	125
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	0.24	0.62	0.89	2.1
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	< 5	< 5	11
Conductivity (at 25°C)						
Conductivity (at 25°C)	10	uS/cm	3100	4700	4000	2100
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	6.8	8.1	7.7	6.3
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.04	5.5	2.1	0.47
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	0.7	2.2	2.1	2.1
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	0.7	2.2	2.1	2.1
Total Suspended Solids Dried at 103°C–105°C						
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	7.0	390	50	11
Turbidity						
Turbidity	1	NTU	15	510	41	7.7
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	< 0.001	0.002	0.002	0.014
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.002	< 0.001	< 0.001	0.004

Client Sample ID			MW108R	MW109	MW301R	MW02
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Jn0035623	M22- Jn0035624	M22- Jn0035625	M22- Jn0035626
Date Sampled			Jun 15, 2022	Jun 15, 2022	Jun 15, 2022	Jun 15, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Iron (filtered)	0.05	mg/L	1.5	0.23	6.8	96
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.005	< 0.001	0.003	0.073
Zinc (filtered)	0.005	mg/L	0.045	< 0.005	< 0.005	0.092
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			MW307R	MW308R	MW302R	FD01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Jn0035627	M22- Jn0035628	M22- Jn0035629	M22- Jn0035630
Date Sampled			Jun 15, 2022	Jun 15, 2022	Jun 15, 2022	Jun 15, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	99	96	96	89
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			MW307R	MW308R	MW302R	FD01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Jn0035627	M22- Jn0035628	M22- Jn0035629	M22- Jn0035630
Date Sampled			Jun 15, 2022	Jun 15, 2022	Jun 15, 2022	Jun 15, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	77	111	126	109
p-Terphenyl-d14 (surr.)	1	%	110	136	85	144
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	28	1.5	0.86	-
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 20	< 5	< 5	-
Conductivity (at 25°C)						
Conductivity (at 25°C)	10	uS/cm	26000	6600	1600	-
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	0.45
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	8.1	7.0	7.3	-
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	8.0	0.50	0.55	0.57
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	24	2.5	1.4	1.8
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	24	2.5	1.4	2.25
Total Suspended Solids Dried at 103°C–105°C						
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	25	20	52	-
Turbidity						
Turbidity	1	NTU	10	220	230	-
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	< 0.001	0.009	0.002	0.002
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.003	< 0.001	< 0.001	< 0.001
Iron (filtered)	0.05	mg/L	0.43	46	25	24
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	< 0.001	0.013	0.004	0.004
Zinc (filtered)	0.005	mg/L	< 0.005	< 0.005	0.021	-
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	-

Client Sample ID			RB01	BASIN 1	BASIN 2	BASIN 3
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Jn0035631	M22- Jn0035632	M22- Jn0035633	M22- Jn0035634
Date Sampled			Jun 15, 2022	Jun 15, 2022	Jun 15, 2022	Jun 15, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	0.2
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	0.2
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02

Client Sample ID			RB01	BASIN 1	BASIN 2	BASIN 3
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Jn0035631	M22- Jn0035632	M22- Jn0035633	M22- Jn0035634
Date Sampled			Jun 15, 2022	Jun 15, 2022	Jun 15, 2022	Jun 15, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	0.06
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	0.06
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	0.2
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	0.26
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	91	91	98	137
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	100	147	94	137
p-Terphenyl-d14 (surr.)	1	%	122	91	115	137
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	-	0.07	< 0.01	0.03
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	-	< 5	10	5.1
Conductivity (at 25°C)						
Conductivity (at 25°C)	10	uS/cm	-	910	1800	1900
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	-	8.0	7.8	7.1
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	< 0.01	0.28	0.27	0.39
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	0.2	1.2	1.3	2.2
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	0.2	1.2	1.3	2.2
Total Suspended Solids Dried at 103°C–105°C						
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	-	< 5	240	40
Turbidity						
Turbidity	1	NTU	-	2.2	31	48

Client Sample ID			RB01	BASIN 1	BASIN 2	BASIN 3
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Jn0035631	M22- Jn0035632	M22- Jn0035633	M22- Jn0035634
Date Sampled			Jun 15, 2022	Jun 15, 2022	Jun 15, 2022	Jun 15, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	< 0.05	-	-	-
Aluminium (filtered)	0.05	mg/L	-	< 0.05	< 0.05	< 0.05
Arsenic	0.001	mg/L	< 0.001	-	-	-
Arsenic (filtered)	0.001	mg/L	-	0.001	< 0.001	< 0.001
Cadmium	0.0002	mg/L	< 0.0002	-	-	-
Cadmium (filtered)	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	-	-	-
Chromium (filtered)	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	-	-	-
Copper (filtered)	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Iron	0.05	mg/L	< 0.05	-	-	-
Iron (filtered)	0.05	mg/L	-	< 0.05	< 0.05	< 0.05
Lead	0.001	mg/L	< 0.001	-	-	-
Lead (filtered)	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	-	-	-
Mercury (filtered)	0.0001	mg/L	-	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	< 0.001	-	-	-
Nickel (filtered)	0.001	mg/L	-	< 0.001	0.005	0.007
Zinc	0.005	mg/L	< 0.005	-	-	-
Zinc (filtered)	0.005	mg/L	-	< 0.005	0.006	< 0.005
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	-	see attached	see attached	see attached

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Jun 16, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Jun 16, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Jun 16, 2022	7 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Melbourne	Jun 16, 2022	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Jun 16, 2022	7 Days
Ammonia (as N) - Method: APHA 4500-NH3 Ammonia Nitrogen by FIA	Melbourne	Jun 16, 2022	28 Days
Biochemical Oxygen Demand (BOD-5 Day) - Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water	Melbourne	Jun 16, 2022	2 Days
Conductivity (at 25°C) - Method: LTM-INO-4030 Conductivity	Melbourne	Jun 16, 2022	28 Days
pH (at 25 °C) - Method: LTM-GEN-7090 pH in water by ISE	Melbourne	Jun 16, 2022	0 Hours
Total Suspended Solids Dried at 103°C–105°C - Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry	Melbourne	Jun 16, 2022	7 Days
Turbidity - Method: Turbidity by classical using APHA 2130B (LTM-INO-4140)	Melbourne	Jun 17, 2022	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Jun 22, 2022	28 Days
Heavy Metals (filtered) - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Jun 22, 2022	180 Days
Mobil Metals : Metals M15 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Jun 16, 2022	28 Days
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N) - Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA	Melbourne	Jun 16, 2022	28 Days
Total Kjeldahl Nitrogen (as N) - Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA	Melbourne	Jun 16, 2022	28 Days
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphate total (as P) - Method: LTM-INO-4040 Phosphate by CFA	Melbourne	Jun 17, 2022	28 Days

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.: 12584780
Report #: 897967
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Jun 15, 2022 2:43 PM
Due: Jun 22, 2022
Priority: 5 Day
Contact Name: Leslie Maranciak

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Aluminium (filtered)	Ammonia (as N)	Arsenic	Arsenic (filtered)	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Cadmium (filtered)	Chromium	Chromium (filtered)	Conductivity (at 25°C)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 105°C-105°C	Turbidity	Eurofins Suite B4	Eurofins Suite B19A: Total N (TKN, NOx), Total P		
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Sydney Laboratory - NATA # 1261 Site # 18217																																		
Brisbane Laboratory - NATA # 1261 Site # 20794																																		
Mayfield Laboratory - NATA # 1261 Site # 25079																																		
Perth Laboratory - NATA # 2377 Site # 2370																																		
External Laboratory																													X					
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																													
1	MW01R	Jun 15, 2022		Water	M22-Jn0035619		X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
2	101R	Jun 15, 2022		Water	M22-Jn0035620		X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
3	MW101R	Jun 15, 2022		Water	M22-Jn0035621		X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
4	MW106R	Jun 15, 2022		Water	M22-Jn0035622		X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
5	MW108R	Jun 15, 2022		Water	M22-Jn0035623		X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
6	MW109	Jun 15, 2022		Water	M22-		X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.: 12584780
Report #: 897967
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Jun 15, 2022 2:43 PM
Due: Jun 22, 2022
Priority: 5 Day
Contact Name: Leslie Maranciak

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Aluminium (filtered)	Ammonia (as N)	Arsenic	Arsenic (filtered)	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Cadmium (filtered)	Chromium	Chromium (filtered)	Conductivity (at 25°C)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 105°C-105°C	Turbidity	Eurofins Suite B4	Eurofins Suite B19A: Total N (TKN, NOx), Total P		
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Sydney Laboratory - NATA # 1261 Site # 18217																																		
Brisbane Laboratory - NATA # 1261 Site # 20794																																		
Mayfield Laboratory - NATA # 1261 Site # 25079																																		
Perth Laboratory - NATA # 2377 Site # 2370																																		
External Laboratory																													X					
					Jn0035624																													
7	MW301R	Jun 15, 2022		Water	M22-Jn0035625	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
8	MW02	Jun 15, 2022		Water	M22-Jn0035626	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
9	MW307R	Jun 15, 2022		Water	M22-Jn0035627	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
10	MW308R	Jun 15, 2022		Water	M22-Jn0035628	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
11	MW302R	Jun 15, 2022		Water	M22-Jn0035629	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
12	FD01	Jun 15, 2022		Water	M22-Jn0035630	X			X			X		X			X		X		X		X		X					X	X	X		

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.: 12584780
Report #: 897967
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Jun 15, 2022 2:43 PM
Due: Jun 22, 2022
Priority: 5 Day
Contact Name: Leslie Maranciak

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Aluminium (filtered)	Ammonia (as N)	Arsenic	Arsenic (filtered)	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Cadmium (filtered)	Chromium	Chromium (filtered)	Conductivity (at 25°C)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 105°C-105°C	Turbidity	Eurofins Suite B4	Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Sydney Laboratory - NATA # 1261 Site # 18217																																			
Brisbane Laboratory - NATA # 1261 Site # 20794																																			
Mayfield Laboratory - NATA # 1261 Site # 25079																																			
Perth Laboratory - NATA # 2377 Site # 2370																																			
External Laboratory																												X							
13	RB01	Jun 15, 2022		Water	M22-Jn0035631	X		X			X		X			X		X		X		X		X							X	X			
14	BASIN 1	Jun 15, 2022		Water	M22-Jn0035632		X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X		
15	BASIN 2	Jun 15, 2022		Water	M22-Jn0035633		X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X		
16	BASIN 3	Jun 15, 2022		Water	M22-Jn0035634		X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X		
Test Counts						1	15	14	1	15	14	1	15	1	15	14	1	15	1	15	1	15	1	15	1	15	14	14	14	14	16	16			

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	mg/L	< 5			5	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Phosphate total (as P)	mg/L	< 0.01			0.01	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Total Suspended Solids Dried at 103°C–105°C	mg/L	< 5			5	Pass	
Turbidity	NTU	< 1			1	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/L	< 0.05			0.05	Pass	
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Arsenic	mg/L	< 0.001			0.001	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Iron	mg/L	< 0.05			0.05	Pass	
Iron (filtered)	mg/L	< 0.05			0.05	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	77			70-130	Pass	
TRH C10-C14	%	120			70-130	Pass	
Naphthalene	%	113			70-130	Pass	
TRH C6-C10	%	79			70-130	Pass	
TRH >C10-C16	%	128			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	98			70-130	Pass	
Toluene	%	113			70-130	Pass	
Ethylbenzene	%	94			70-130	Pass	
m&p-Xylenes	%	88			70-130	Pass	
Xylenes - Total*	%	89			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	115			70-130	Pass	
Acenaphthylene	%	113			70-130	Pass	
Anthracene	%	117			70-130	Pass	
Benz(a)anthracene	%	102			70-130	Pass	
Benzo(a)pyrene	%	81			70-130	Pass	
Benzo(b&j)fluoranthene	%	101			70-130	Pass	
Benzo(g,h,i)perylene	%	92			70-130	Pass	
Benzo(k)fluoranthene	%	98			70-130	Pass	
Chrysene	%	112			70-130	Pass	
Dibenz(a,h)anthracene	%	124			70-130	Pass	
Fluoranthene	%	94			70-130	Pass	
Fluorene	%	118			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	105			70-130	Pass	
Naphthalene	%	98			70-130	Pass	
Phenanthrene	%	103			70-130	Pass	
Pyrene	%	95			70-130	Pass	
LCS - % Recovery							
Ammonia (as N)	%	101			70-130	Pass	
Conductivity (at 25°C)	%	93			70-130	Pass	
Nitrate & Nitrite (as N)	%	88			70-130	Pass	
Phosphate total (as P)	%	94			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	83			70-130	Pass	
LCS - % Recovery							
Heavy Metals							

Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Aluminium			%	92		80-120	Pass	
Arsenic			%	88		80-120	Pass	
Cadmium			%	85		80-120	Pass	
Chromium			%	90		80-120	Pass	
Copper			%	90		80-120	Pass	
Iron			%	85		80-120	Pass	
Lead			%	84		80-120	Pass	
Mercury			%	86		80-120	Pass	
Nickel			%	89		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Total Recoverable Hydrocarbons				Result 1				
TRH C6-C9	M22-Jn0040850	NCP	%	115		70-130	Pass	
TRH C10-C14	M22-Jn0037664	NCP	%	119		70-130	Pass	
Naphthalene	M22-Jn0040850	NCP	%	83		70-130	Pass	
TRH C6-C10	M22-Jn0040850	NCP	%	128		70-130	Pass	
TRH >C10-C16	M22-Jn0037664	NCP	%	127		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	M22-Jn0040850	NCP	%	82		70-130	Pass	
Toluene	M22-Jn0040850	NCP	%	95		70-130	Pass	
Ethylbenzene	M22-Jn0040850	NCP	%	98		70-130	Pass	
m&p-Xylenes	M22-Jn0040850	NCP	%	95		70-130	Pass	
o-Xylene	M22-Jn0040850	NCP	%	93		70-130	Pass	
Xylenes - Total*	M22-Jn0040850	NCP	%	95		70-130	Pass	
Spike - % Recovery								
				Result 1				
Total Kjeldahl Nitrogen (as N)	M22-Jn0036478	NCP	%	80		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Iron (filtered)	M22-Jn0035087	NCP	%	83		75-125	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Aluminium (filtered)	M22-Jn0035626	CP	%	93		75-125	Pass	
Arsenic (filtered)	M22-Jn0035626	CP	%	93		75-125	Pass	
Cadmium (filtered)	M22-Jn0035626	CP	%	95		75-125	Pass	
Chromium (filtered)	M22-Jn0035626	CP	%	95		75-125	Pass	
Copper (filtered)	M22-Jn0035626	CP	%	96		75-125	Pass	
Lead (filtered)	M22-Jn0035626	CP	%	97		75-125	Pass	
Mercury (filtered)	M22-Jn0035626	CP	%	84		75-125	Pass	
Nickel (filtered)	M22-Jn0035626	CP	%	86		75-125	Pass	
Spike - % Recovery								
				Result 1				
Total Suspended Solids Dried at 103°C-105°C	M22-Jn0035627	CP	%	47		70-130	Fail	Q08
Spike - % Recovery								
Heavy Metals				Result 1				
Aluminium	M22-Jn0037089	NCP	%	89		75-125	Pass	
Arsenic	M22-Jn0037089	NCP	%	84		75-125	Pass	
Cadmium	M22-Jn0037089	NCP	%	86		75-125	Pass	
Chromium	M22-Jn0037089	NCP	%	88		75-125	Pass	
Copper	M22-Jn0037089	NCP	%	87		75-125	Pass	
Iron	M22-Jn0037089	NCP	%	82		75-125	Pass	
Lead	M22-Jn0037089	NCP	%	83		75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mercury	M22-Jn0037089	NCP	%	79			75-125	Pass	
Nickel	M22-Jn0037089	NCP	%	86			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	M22-Jn0040849	NCP	mg/L	0.04	0.04	3.0	30%	Pass	
TRH C10-C14	M22-Jn0037041	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M22-Jn0037041	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M22-Jn0037041	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Naphthalene	M22-Jn0040849	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M22-Jn0040849	NCP	mg/L	0.04	0.04	3.0	30%	Pass	
TRH >C10-C16	M22-Jn0037041	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M22-Jn0037041	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M22-Jn0037041	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M22-Jn0040849	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M22-Jn0040849	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M22-Jn0040849	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M22-Jn0040849	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M22-Jn0040849	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	M22-Jn0040849	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&i)fluoranthene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g,h,i)perylene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a,h)anthracene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M22-Jn0035093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	R22-Jn0032443	NCP	mg/L	0.14	0.12	10	30%	Pass	
Conductivity (at 25°C)	M22-Jn0036478	NCP	uS/cm	1200	1200	2.0	30%	Pass	
Nitrate & Nitrite (as N)	R22-Jn0032443	NCP	mg/L	0.09	0.09	4.0	30%	Pass	
pH (at 25 °C)	M22-Jn0036478	NCP	pH Units	7.0	6.9	pass	30%	Pass	
Phosphate total (as P)	M22-Jn0036483	NCP	mg/L	0.02	0.03	18	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Iron (filtered)	M22-Jn0035087	NCP	mg/L	0.15	0.15	5.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Kjeldahl Nitrogen (as N)	M22-Jn0035620	CP	mg/L	10	13	26	30%	Pass	

Duplicate								
				Result 1	Result 2	RPD		
Turbidity	M22-Jn0035622	CP	NTU	35	34	2.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Total Suspended Solids Dried at 103°C–105°C	M22-Jn0035626	CP	mg/L	11	6.0	60	30%	Fail Q15
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium (filtered)	M22-Jn0035626	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Arsenic (filtered)	M22-Jn0035626	CP	mg/L	0.014	0.015	6.0	30%	Pass
Cadmium (filtered)	M22-Jn0035626	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium (filtered)	M22-Jn0035626	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper (filtered)	M22-Jn0035626	CP	mg/L	0.004	0.004	1.0	30%	Pass
Lead (filtered)	M22-Jn0035626	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury (filtered)	M22-Jn0035626	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel (filtered)	M22-Jn0035626	CP	mg/L	0.073	0.074	<1	30%	Pass
Zinc (filtered)	M22-Jn0035626	CP	mg/L	0.092	0.095	4.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium	M22-Jn0037089	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Arsenic	M22-Jn0037089	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Cadmium	M22-Jn0037089	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium	M22-Jn0037089	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper	M22-Jn0037089	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Iron	M22-Jn0037089	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Lead	M22-Jn0037089	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury	M22-Jn0037089	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	M22-Jn0037089	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Biochemical Oxygen Demand (BOD-5 Day)	M22-Jn0035632	CP	mg/L	< 5	< 5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Turbidity	M22-Jn0035634	CP	NTU	48	47	1.0	30%	Pass

Comments

Thermotolerant coliforms analysed by; Eurofins Food Testing; accreditation number 20293; report reference AR-22-NV-007769-01
 V2- new version to add in Znfil and Zn on all samples bar FD01 and FD02 that was missed

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Andrew Black	Analytical Services Manager
Caitlin Breeze	Senior Analyst-Inorganic
Carroll Lee	Senior Analyst-Volatile
Edward Lee	Senior Analyst-Organic
Emily Rosenberg	Senior Analyst-Metal
Harry Bacalis	Senior Analyst-Volatile
Joseph Edouard	Senior Analyst-Volatile
Mary Makarios	Senior Analyst-Metal
Scott Beddoes	Senior Analyst-Inorganic



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

ANALYTICAL REPORT

REPORT CODE
AR-22-NV-007769-01
REPORT DATE
20/06/2022

For the attention of

Eurofins Environment Testing Australia Pty Ltd

 Analytical Reports
 6 Monterey Road

Dandenong South

 3175 Melbourne
 AUSTRALIA

Phone +61 3 8564 5064

Email EnviroReportsau@eurofins.com

Contact for your orders:

Ruvini Herath

Order code:

EUAUTWU-00018475

Submission Reference:

 Merged from order
 cau001-order-897967-220616.xml

Purchase Order Number:

897967

SAMPLE CODE
726-2022-00021567
Client Reference:

22-Jn0035619

Sample described as:

MW01R

Reception Date:

16/06/2022

Analysis Starting Date:

16/06/2022

Sampled Date & Time

15/06/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

20/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 18/06/2022 16:19

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	<10	MPN/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE
726-2022-00021568
Client Reference:

22-Jn0035620

Sample described as:

101R

Reception Date:

16/06/2022

Analysis Starting Date:

16/06/2022

Sampled Date & Time

15/06/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

20/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 18/06/2022 16:19

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	<10	MPN/100 ml	1
--------------------------	-----	------------	---

Eurofins Food Testing Australia Pty Ltd

 6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

 Accredited for compliance with ISO/IEC
 17025 - Testing
 NATA is a signatory to the ILAC Mutual
 Recognition Arrangement for the mutual
 recognition of the equivalence of testing,
 medical testing, calibration, inspection,
 proficiency testing scheme providers and
 reference materials producers reports and
 certificates.
 Accreditation Number 20293


SAMPLE CODE 726-2022-00021569

Client Reference: 22-Jn0035621
Sample described as: MW101R
Reception Date: 16/06/2022
Analysis Starting Date: 16/06/2022
Sampled Date & Time: 15/06/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 20/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 18/06/2022 16:19

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	<10	MPN/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE 726-2022-00021570

Client Reference: 22-Jn0035622
Sample described as: MW106R
Reception Date: 16/06/2022
Analysis Starting Date: 16/06/2022
Sampled Date & Time: 15/06/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 20/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 18/06/2022 16:19

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	<10	MPN/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE 726-2022-00021571

Client Reference: 22-Jn0035623
Sample described as: MW108R
Reception Date: 16/06/2022
Analysis Starting Date: 16/06/2022
Sampled Date & Time: 15/06/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 20/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 20/06/2022 16:10

Thermotolerant coliforms	10	cfu/ml	1
--------------------------	----	--------	---

VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	1400	MPN/100 ml	1
--------------------------	------	------------	---

SAMPLE CODE 726-2022-00021572

Client Reference: 22-Jn0035624
Sample described as: MW109
Reception Date: 16/06/2022
Analysis Starting Date: 16/06/2022
Sampled Date & Time: 15/06/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 20/06/2022

Eurofins Food Testing Australia Pty Ltd

 6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

Accredited for compliance with ISO/IEC 17025 - Testing
 NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
 Accreditation Number 20293



RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 20/06/2022 16:14

Thermotolerant coliforms	5	cfu/ml	1
--------------------------	---	--------	---

VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	540	MPN/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE
726-2022-00021573

Client Reference: 22-Jn0035625
Sample described as: MW301R
Reception Date: 16/06/2022
Analysis Starting Date: 16/06/2022
Sampled Date & Time: 15/06/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 20/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 20/06/2022 16:15

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	<10	MPN/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE
726-2022-00021574

Client Reference: 22-Jn0035626
Sample described as: MW02
Reception Date: 16/06/2022
Analysis Starting Date: 16/06/2022
Sampled Date & Time: 15/06/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 20/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 20/06/2022 16:15

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	<1	MPN/100 ml	1
--------------------------	----	------------	---

SAMPLE CODE
726-2022-00021575

Client Reference: 22-Jn0035627
Sample described as: MW307R
Reception Date: 16/06/2022
Analysis Starting Date: 16/06/2022
Sampled Date & Time: 15/06/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 20/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 20/06/2022 16:16

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

VQ797 Thermotolerant Coliforms
Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

Accredited for compliance with ISO/IEC 17025 - Testing
 NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
 Accreditation Number 20293



RESULTS
LOQ
VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	<10	MPN/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE
726-2022-00021576
Client Reference: 22-Jn0035628

Sample described as: MW308R

Reception Date: 16/06/2022

Analysis Starting Date: 16/06/2022

Sampled Date & Time 15/06/2022 12:00:00

Reception temperature: 5.3 °C

Analysis Ending Date: 20/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 20/06/2022 16:16

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	<10	MPN/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE
726-2022-00021577
Client Reference: 22-Jn0035629

Sample described as: MW302R

Reception Date: 16/06/2022

Analysis Starting Date: 16/06/2022

Sampled Date & Time 15/06/2022 12:00:00

Reception temperature: 5.3 °C

Analysis Ending Date: 20/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 20/06/2022 16:17

Thermotolerant coliforms	1	cfu/ml	1
--------------------------	---	--------	---

VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	97	MPN/100 ml	1
--------------------------	----	------------	---

SAMPLE CODE
726-2022-00021578
Client Reference: 22-Jn0035632

Sample described as: BASIN 1

Reception Date: 16/06/2022

Analysis Starting Date: 16/06/2022

Sampled Date & Time 15/06/2022 12:00:00

Reception temperature: 5.3 °C

Analysis Ending Date: 20/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 20/06/2022 16:17

Thermotolerant coliforms	2	cfu/ml	1
--------------------------	---	--------	---

VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	220	MPN/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE 726-2022-00021579

Client Reference: 22-Jn0035633
Sample described as: BASIN 2
Reception Date: 16/06/2022
Analysis Starting Date: 16/06/2022
Sampled Date & Time: 15/06/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 20/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 20/06/2022 16:17

Thermotolerant coliforms	1	cfu/ml	1
--------------------------	---	--------	---

VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	160	MPN/100 ml	1
--------------------------	-----	------------	---

SAMPLE CODE 726-2022-00021580

Client Reference: 22-Jn0035634
Sample described as: BASIN 3
Reception Date: 16/06/2022
Analysis Starting Date: 16/06/2022
Sampled Date & Time: 15/06/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 20/06/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 20/06/2022 16:18

Thermotolerant coliforms	5	cfu/ml	1
--------------------------	---	--------	---

VQ797 Thermotolerant Coliforms

Analysis Starting Date: 16/06/2022 15:00

Thermotolerant coliforms	520	MPN/100 ml	1
--------------------------	-----	------------	---

LIST OF METHODS

VQ792 Thermotolerant Coliforms: AS 4276.7

VQ797 Thermotolerant Coliforms: AS 4276.7

Signature

Komal Gosain Laboratory Manager

EXPLANATORY NOTE

- ◆ test is not accredited
- test is subcontracted within Eurofins group and is accredited
- test is subcontracted within Eurofins group and is not accredited
- test is subcontracted outside Eurofins group and is accredited
- test is subcontracted outside Eurofins group and is not accredited

N/A means Not applicable

Not Detected means not detected at or above the Limit of Quantification (LOQ)

LOQ Limit of Quantification

U Measurement Uncertainty

< Less than, ≤ Less than or equal to

> Greater than, ≥ Greater than or equal to

The tests are identified by a 5 digit code, full details can be provided on request.

Information supplied by the client. This information can have an impact on the validity of results.

Samples are tested as received and the results relate only to the sample tested.

Analysis date is reported as the start date of extraction for a method.

The results may not be reproduced except in full, without a written approval from the laboratory.

Eurofins General Terms and Conditions apply.

END OF REPORT

Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/foc>

Accredited for compliance with ISO/IEC 17025 - Testing
 NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
 Accreditation Number 20293



Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne

6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261 Site # 1254

Sydney

179 Magowar Road
Girraween NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane

1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Newcastle

4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth

46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 6253 4444
NATA # 2377 Site # 2370

Eurofins Environment Testing NZ Limited

NZBN: 9429046024954

Auckland

35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch

43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name: GHD Pty Ltd NEWCASTLE
Contact name: Leslie Maranciak
Project name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780
Turnaround time: 5 Day
Date/Time received: Jun 15, 2022 2:43 PM
Eurofins reference: 897967

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 8.3 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✓ Split sample sent to requested external lab.
- ✓ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Leslie Maranciak - leslie.maranciak@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NEWCASTLE email address.



mgt

Sydney
 Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
 Phone: +612 9900 8400
 Email: enviro.syd@mgflabmark.com.au

Brisbane
 Unit 1-21 Smallwood Place, Murrarie
 Phone: +617 3902 4600
 Email: enviro.bris@mgflabmark.com.au

Melbourne
 2 Kingston Town Close, Oakleigh, VIC 3166
 Phone: +613 8564 5000 Fax: +613 8564 5090
 Email: enquiries.melb@mgflabmark.com.au

42

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name: GHD	Contact Name: Lachlan Parkinson	Purchase Order: 12584780	Page: _____ of _____
Office Address: L3, 24 Honeysuckle Drive Newcastle 2300	Project Manager: Leslie Maranciak	PROJECT Number: 12584780	QC Number: _____
	Email for results: Lachlan.Parkinson@ghd.com Leslie.Maranciak@ghd.com	PROJECT Name: Aurizon Hexham Water Monitoring	Eurofins | mgt quote ID: 180501GHD
			Data output format: ESDAT

Special Directions & Comments:

Please ensure fecal coliforms are reported in CFU/100ml

Analytes

Some common holding times (with correct preservation).
 For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, NH4e, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Eurofins | mgt DI water batch number:

Sample ID	Date	Matrix	Analytes										Containers:						Sample comments:			
			B4 (BTEXN / TRH / PAH)	Total Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	Suite B15A (Nutrients, Total N (TKN, NOX), Total P	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day	1LP	250P	125P	1LA	40mL vial	125mLA	Jar						
1	15/6/22	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
2	15/6/22	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
3	15/6/22	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4	15/6/22	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5	15/6/22	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6	15/6/22	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
7	15/6/22	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8	15/6/22	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
9	15/6/22	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10	15/6/22	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
11	15/6/22	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12	15/6/22	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
13	Basin 1	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
14	Basin 2	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
15	Basin 3	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
16																						
17																						
18																						
19																						
20																						

Relinquished By: L. Parkinson	Received By: Wendy Stewart	Turn around time	Method Of Shipment	Temperature on arrival:
Date & Time: 15/6/22	Date & Time: 15/6/22 2:43 PM	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>	<input checked="" type="checkbox"/> Courier	8.3
Signature: [Signature]	Signature: [Signature]	6 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other: _____	<input type="checkbox"/> Hand Delivered	Report number:
			<input type="checkbox"/> Postal	
			Courier Consignment #:	



mgt

Sydney
 Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
 Phone: +612 9900 8400
 Email: enviro.syd@mgllabmark.com.au

Brisbane
 Unit 1-21 Smallwood Place, Murrane
 Phone: +617 3902 4600
 Email: enviro.bris@mgllabmark.com.au

Melbourne
 2 Kingston Town Close, Oakleigh, VIC 3166
 Phone: +613 8564 5000 Fax: +613 8564 5090
 Email: enquiries.melb@mgllabmark.com.au

COPY

5

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name: **GHD** Contact Name: **Lachlan Parkinson** Purchase Order: **12584780** Page ____ of ____
 Office Address: **L3, 24 Honeysuckle Drive** Project Manager: **Leslie Maranciak** PROJECT Number: **12584780** Eurofins | mgt quote ID: **180501GHD**
Newcastle 2300 Email for results: **Lachlan.Parkinson@ghd.com** PROJECT Name: **Aurizon Hexham Water Monitoring** Data output format: **ESDAT**
Leslie.Maranciak@ghd.com

Special Directions & Comments:
Please ensure fecal coliforms are reported in CFU/100ml

Analytes

Some common holding times (with correct preservation).
 For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Eurofins | mgt | water batch number:

Sample ID	Date	Matrix	B4 (BTEXN / TRH / PAH)	Dissolved Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	Suite 819A (Nutrients, Total N (TKN), NOX), Total P	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day	Send to ALS - same analysis as FD01 at ALS please	Containers:	Sample comments:							
											1LP	250P	125P	1LA	40mL vial	125mL A	Jar		
1	MW01R	15/6/22	W	X	X	X	X	X	X	X									
2	101R		W	X	X	X	X	X	X	X									
3	MW101R		W	X	X	X	X	X	X	X									
4	MW106R		W	X	X	X	X	X	X	X									
5	MW108R		W	X	X	X	X	X	X	X									
6	MW109		W	X	X	X	X	X	X	X									
7	MW301R		W	X	X	X	X	X	X	X									
8	MW02		W	X	X	X	X	X	X	X									
9	MW307R		W	X	X	X	X	X	X	X									
10	MW308R		W	X	X	X	X	X	X	X									
11	MW302R		W	X	X	X	X	X	X	X									
12	FD01		W	X	X			X											
13	FD02		W							X									Same Analysis as FD01
14	RB01		W	X	X			X											
16																			
16																			
17																			

Relinquished By: **L. Parkinson** Received By: **Jordan Slougra** Laboratory Staff

Date & Time: **15/6/22** Date & Time: **15/6/22 2:43 PM** Turn around time

Signature: **[Signature]** Signature: **[Signature]** Method Of Shipment

Temperature on arrival: **8-3** Report number:

Courier Hand Delivered Postal

Courier Consignment #:

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **Leslie Maranciak**

Report **899844-W**
Project name **AURIZON HEXHAM WATER MONITORING**
Project ID **12584780**
Received Date **Jun 23, 2022**

Client Sample ID			BASIN 1	BASIN 2	BASIN 3
Sample Matrix			Water	Water	Water
Eurofins Sample No.			M22- Jn0051489	M22- Jn0051490	M22- Jn0051491
Date Sampled			Jun 15, 2022	Jun 15, 2022	Jun 15, 2022
Test/Reference	LOR	Unit			
Heavy Metals					
Aluminium	0.05	mg/L	< 0.05	0.23	< 0.05
Arsenic	0.001	mg/L	0.001	0.003	< 0.001
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	0.004	< 0.001
Iron	0.05	mg/L	0.06	2.8	6.8
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	< 0.001	0.012	0.009
Zinc	0.005	mg/L	0.009	0.016	0.013

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Jun 23, 2022	28 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Jun 23, 2022	28 Days

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.:
Report #: 899844
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Jun 23, 2022 8:59 AM
Due: Jun 24, 2022
Priority: 1 Day
Contact Name: Leslie Maranciak

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Iron	Metals M8
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
Perth Laboratory - NATA # 2377 Site # 2370								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	BASIN 1	Jun 15, 2022		Water	M22-Jn0051489	X	X	X
2	BASIN 2	Jun 15, 2022		Water	M22-Jn0051490	X	X	X
3	BASIN 3	Jun 15, 2022		Water	M22-Jn0051491	X	X	X
Test Counts						3	3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Aluminium			mg/L	< 0.05			0.05	Pass	
Arsenic			mg/L	< 0.001			0.001	Pass	
Cadmium			mg/L	< 0.0002			0.0002	Pass	
Chromium			mg/L	< 0.001			0.001	Pass	
Copper			mg/L	< 0.001			0.001	Pass	
Iron			mg/L	< 0.05			0.05	Pass	
Lead			mg/L	< 0.001			0.001	Pass	
Mercury			mg/L	< 0.0001			0.0001	Pass	
Nickel			mg/L	< 0.001			0.001	Pass	
Zinc			mg/L	< 0.005			0.005	Pass	
LCS - % Recovery									
Heavy Metals									
Aluminium			%	94			80-120	Pass	
Arsenic			%	90			80-120	Pass	
Cadmium			%	90			80-120	Pass	
Chromium			%	91			80-120	Pass	
Copper			%	88			80-120	Pass	
Iron			%	87			80-120	Pass	
Lead			%	84			80-120	Pass	
Mercury			%	83			80-120	Pass	
Nickel			%	90			80-120	Pass	
Zinc			%	89			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	M22-Jn0049880	NCP	%	92			75-125	Pass	
Arsenic	M22-Jn0049880	NCP	%	94			75-125	Pass	
Cadmium	M22-Jn0049880	NCP	%	89			75-125	Pass	
Chromium	M22-Jn0049880	NCP	%	93			75-125	Pass	
Copper	M22-Jn0049880	NCP	%	90			75-125	Pass	
Iron	M22-Jn0049880	NCP	%	86			75-125	Pass	
Lead	M22-Jn0049880	NCP	%	83			75-125	Pass	
Mercury	M22-Jn0049880	NCP	%	85			75-125	Pass	
Nickel	M22-Jn0049880	NCP	%	91			75-125	Pass	
Zinc	M22-Jn0049880	NCP	%	94			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	M22-Jn0049880	NCP	mg/L	0.28	0.30	7.0	30%	Pass	
Arsenic	M22-Jn0049880	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	M22-Jn0051511	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M22-Jn0049880	NCP	mg/L	0.001	0.001	2.0	30%	Pass	
Copper	M22-Jn0049880	NCP	mg/L	0.004	0.004	6.0	30%	Pass	
Iron	M22-Jn0049880	NCP	mg/L	0.37	0.38	2.0	30%	Pass	
Lead	M22-Jn0049880	NCP	mg/L	0.001	0.002	4.0	30%	Pass	
Mercury	M22-Jn0051511	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M22-Jn0049880	NCP	mg/L	0.003	0.003	8.0	30%	Pass	
Zinc	M22-Jn0049880	NCP	mg/L	0.053	0.050	5.0	30%	Pass	

Comments**Sample Integrity**

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Emma Beesley	Analytical Services Manager
Mary Makarios	Senior Analyst-Metal



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne

6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261 Site # 1254

Sydney

179 Magowar Road
Girraween NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane

1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Newcastle

4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth

46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 6253 4444
NATA # 2377 Site # 2370

Eurofins Environment Testing NZ Limited

NZBN: 9429046024954

Auckland

35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch

43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name: GHD Pty Ltd NEWCASTLE
Contact name: Leslie Maranciak
Project name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780
Turnaround time: 1 Day
Date/Time received: Jun 23, 2022 8:59 AM
Eurofins reference: 899844

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Leslie Maranciak - leslie.maranciak@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NEWCASTLE email address.

#AU CAU001 EnviroSampleVic

From: Andrew Black
Sent: Thursday, 23 June 2022 8:59 AM
To: #AU_CAU001_EnviroSampleVic
Subject: 1 DAY TAT ADDITIONAL ANALYSIS: FW: Eurofins Test Results - Report 897967 : Site AURIZON HEXHAM WATER MONITORING (12584780)
Importance: High

INFO: INTERNAL EMAIL - Sent from your own Eurofins email domain.

Morning team

From this report the last 3 samples need to be total metals. Please log in additionally on 1 day TAT for the total metals of M8, Fe, Al

Andrew Black
Analytical Services Manager

Eurofins | Environment Testing Australia Pty Ltd
Unit 7
7 Friesian Close
SANDGATE, NSW, 2304
AUSTRALIA
Phone: +61 2 9900 8490
Mobile: +61 410 220 750
Email: AndrewBlack@eurofins.com
Website: eurofins.com.au/environmental-testing

Jn0035632 - GT1181-93 / GT1181-M1
Jn0035633 - ↓
Jn0035634 - ↓
899844
G/W EF
23/6/22

This e-mail including its attachments may contain confidential and proprietary information. Any unauthorized disclosure or use of this e-mail including its attachments is prohibited and may be prosecuted. If you are not the intended recipient, please inform the sender by an e-mail reply and delete the message. Transmission by e-mail is not secure and can result in errors or omissions in the content of the message. Despite state-of-the-art precautions we cannot guarantee that e-mails and attachments are free from viruses. We accept no liability for viruses or any transmission-related errors and omissions. You need to always virus-check any e-mails and attachments. Eurofins companies are independent legal entities that are bound only by members of their management bodies. No other persons have representation power unless specifically authorised by proxy or other legal means.

For sample receipt enquiries (eg. SRAs, changes to analysis) please contact EnvirosampleNSW@eurofins.com or 02 9900 8421 (7am – 9pm).

For despatch enquiries (eg. courier bookings, bottle orders) please contact AU04_Despatch_SYD@eurofins.com or 0488 400 929 (8am – 4pm).

From: Leslie Maranciak <Leslie.Maranciak@ghd.com>
Sent: Wednesday, 22 June 2022 4:30 PM
To: Andrew Black <AndrewBlack@eurofins.com>; Lachlan Parkinson <Lachlan.Parkinson@ghd.com>
Subject: RE: Eurofins Test Results - Report 897967 : Site AURIZON HEXHAM WATER MONITORING (12584780)

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Andrew- it looks like the sample analysis for the 3 basin samples was logged in as dissolved metals, but per COC should have been total.

CERTIFICATE OF ANALYSIS

Work Order	: EM2211420	Page	: 1 of 6
Client	: GHD PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: Leslie Maranciak	Contact	: Shirley LeCornu
Address	: Level 3, GHD Tower, 24 Honeysuckle Drive Newcastle 2300	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9630
Project	: 12584780	Date Samples Received	: 16-Jun-2022 16:41
Order number	: 12584780	Date Analysis Commenced	: 17-Jun-2022
C-O-C number	: ----	Issue Date	: 22-Jun-2022 15:00
Sampler	: ----		
Site	: ----		
Quote number	: ME/875/20 B - SECONDARY WORK ONLY		
No. of samples received	: 1		
No. of samples analysed	: 1		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Jarwis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FD02	----	----	----	----
Sampling date / time				15-Jun-2022 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	EM2211420-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	<0.01	----	----	----	----	
Arsenic	7440-38-2	0.001	mg/L	0.002	----	----	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----	
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----	
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----	
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----	
Nickel	7440-02-0	0.001	mg/L	0.005	----	----	----	----	
Zinc	7440-66-6	0.005	mg/L	0.029	----	----	----	----	
Iron	7439-89-6	0.05	mg/L	29.1	----	----	----	----	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	----	----	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.3	----	----	----	----	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	1.3	----	----	----	----	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.48	----	----	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----	
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----	
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----	
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----	
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----	
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FD02	----	----	----	----
Sampling date / time				15-Jun-2022 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	EM2211420-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----	
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----	
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----	
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----	
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----	
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----	
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----	
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----	
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	----	----	----	----	
Toluene	108-88-3	2	µg/L	<2	----	----	----	----	
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----	
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----	
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----	
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----	
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%	61.4	----	----	----	----	
Anthracene-d10	1719-06-8	1.0	%	63.9	----	----	----	----	
4-Terphenyl-d14	1718-51-0	1.0	%	66.2	----	----	----	----	
EP080S: TPH(V)/BTEX Surrogates									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FD02	----	----	----	----
Sampling date / time				15-Jun-2022 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	EM2211420-001	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued									
1,2-Dichloroethane-D4	17060-07-0	2	%	95.1	----	----	----	----	----
Toluene-D8	2037-26-5	2	%	93.2	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	106	----	----	----	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	35	127
Anthracene-d10	1719-06-8	44	122
4-Terphenyl-d14	1718-51-0	44	124
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

QUALITY CONTROL REPORT

Work Order	: EM2211420	Page	: 1 of 6
Client	: GHD PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: Leslie Maranciak	Contact	: Shirley LeCornu
Address	: Level 3, GHD Tower, 24 Honeysuckle Drive Newcastle 2300	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9630
Project	: 12584780	Date Samples Received	: 16-Jun-2022
Order number	: 12584780	Date Analysis Commenced	: 17-Jun-2022
C-O-C number	: ----	Issue Date	: 22-Jun-2022
Sampler	: ----		
Site	: ----		
Quote number	: ME/875/20 B - SECONDARY WORK ONLY		
No. of samples received	: 1		
No. of samples analysed	: 1		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Jarwis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4405191)									
EM2211354-021	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.014	0.014	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.006	0.006	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2211368-002	Anonymous	EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.050	0.051	0.0	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.007	0.007	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.015	0.014	0.0	No Limit
EM2211420-001	FD02	EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.28	0.28	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 4405194)									
EM2211385-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4405282)									
EM2211420-001	FD02	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4406362)									

Page : 3 of 6
 Work Order : EM2211420
 Client : GHD PTY LTD
 Project : 12584780



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4406362) - continued										
EM2211420-001	FD02	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.3	1.2	0.0	0% - 50%	
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4406361)										
EM2211237-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	6.55	7.44	12.7	0% - 20%	
EM2211239-009	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.06	0.06	0.0	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4405747)										
EM2211406-009	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
EM2211406-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4405747)										
EM2211406-009	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
EM2211406-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
EP080: BTEXN (QC Lot: 4405747)										
EM2211406-009	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
			95-47-6	2	µg/L	<2	<2	0.0	No Limit	
EM2211406-001	Anonymous	EP080: ortho-Xylene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
	95-47-6	2	µg/L	<2	<2	0.0	No Limit			
	91-20-3	5	µg/L	<5	<5	0.0	No Limit			



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 4405191)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	105	90.4	111
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	107	89.0	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	103	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	106	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	104	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	104	84.6	108
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	105	84.3	110
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	110	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	111	91.8	112
EG035F: Dissolved Mercury by FIMS (QCLot: 4405194)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	92.2	71.6	116
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4405282)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	104	90.0	117
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4406362)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	91.2	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4406361)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	77.4	71.9	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4405425)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	72.8	42.8	114
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	71.6	48.6	119
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	72.5	47.0	117
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	72.8	49.5	119
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	74.7	49.4	121
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	72.8	48.4	122
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	69.9	50.3	124
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	71.5	50.0	126
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	73.4	49.4	127
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	74.1	48.7	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	74.4	54.5	134
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	70.6	56.1	134
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	70.8	55.6	135
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	72.0	54.4	126
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	72.5	54.5	126



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4405425) - continued								
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	73.0	54.4	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4405426)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4000 µg/L	76.1	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	16900 µg/L	80.9	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8090 µg/L	79.6	50.4	127
EP071: C10 - C36 Fraction (sum)	----	50	µg/L	<50	28990 µg/L	80.0	51.5	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4405747)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	105	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4405426)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5830 µg/L	85.0	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	21700 µg/L	84.1	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1560 µg/L	79.0	47.2	130
EP071: >C10 - C40 Fraction (sum)	----	100	µg/L	<100	29090 µg/L	83.8	51.2	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4405747)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	102	66.2	132
EP080: BTEXN (QCLot: 4405747)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	107	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	108	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	106	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	108	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	110	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	102	68.3	131

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%)	Acceptable Limits (%)	
					MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 4405191)							
EM2211354-021	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	102	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	94.6	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	96.2	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	97.5	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	91.6	75.0	133
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	96.1	73.0	131



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 4405191) - continued							
EM2211354-021	Anonymous	EG020A-F: Zinc	7440-66-6	0.2 mg/L	96.7	75.0	131
EG035F: Dissolved Mercury by FIMS (QCLot: 4405194)							
EM2211385-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	97.0	70.0	120
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4406362)							
EM2211426-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	107	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4406361)							
EM2211237-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	# Not Determined	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4405747)							
EM2211406-002	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	71.3	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4405747)							
EM2211406-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	69.1	34.0	122
EP080: BTEXN (QCLot: 4405747)							
EM2211406-002	Anonymous	EP080: Benzene	71-43-2	20 µg/L	94.7	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	95.4	60.4	132

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM2211420	Page	: 1 of 6
Client	: GHD PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: Leslie Maranciak	Telephone	: +6138549 9630
Project	: 12584780	Date Samples Received	: 16-Jun-2022
Site	: ----	Issue Date	: 22-Jun-2022
Sampler	: ----	No. of samples received	: 1
Order number	: 12584780	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK067G: Total Phosphorus as P by Discrete Analyser	EM2211237--002	Anonymous	Total Phosphorus as P	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	8	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Nitrite and Nitrate as N (NOx) by Discrete Analyser	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	8	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for **VOC in soils** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) FD02	15-Jun-2022	----	----	----	17-Jun-2022	12-Dec-2022	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) FD02	15-Jun-2022	----	----	----	18-Jun-2022	13-Jul-2022	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) FD02	15-Jun-2022	----	----	----	18-Jun-2022	13-Jul-2022	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) FD02	15-Jun-2022	20-Jun-2022	13-Jul-2022	✓	20-Jun-2022	13-Jul-2022	✓



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) FD02	15-Jun-2022	20-Jun-2022	13-Jul-2022	✓	20-Jun-2022	13-Jul-2022	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) FD02	15-Jun-2022	17-Jun-2022	22-Jun-2022	✓	20-Jun-2022	27-Jul-2022	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) FD02	15-Jun-2022	17-Jun-2022	22-Jun-2022	✓	20-Jun-2022	27-Jul-2022	✓
Clear glass VOC vial - HCl (EP080) FD02	15-Jun-2022	17-Jun-2022	29-Jun-2022	✓	17-Jun-2022	29-Jun-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) FD02	15-Jun-2022	17-Jun-2022	22-Jun-2022	✓	20-Jun-2022	27-Jul-2022	✓
Clear glass VOC vial - HCl (EP080) FD02	15-Jun-2022	17-Jun-2022	29-Jun-2022	✓	17-Jun-2022	29-Jun-2022	✓
EP080: BTEXN							
Clear glass VOC vial - HCl (EP080) FD02	15-Jun-2022	17-Jun-2022	29-Jun-2022	✓	17-Jun-2022	29-Jun-2022	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	1	3	33.33	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	100.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	6	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	2	50.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	8	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	0	1	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	6	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	8	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)

Page : 6 of 6
Work Order : EM2211420
Client : GHD PTY LTD
Project : 12584780



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.



mgt

Sydney
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 6400
Email: enviro.syd@mgtabmark.com.au

Brisbane
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: enviro.bris@mgtabmark.com.au

Melbourne
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 9564 5000 Fax: +613 9564 5090
Email: enquiries.melb@mgtabmark.com.au

112

COPY

5

CHAIN OF CUSTODY RECORD

CLIENT DETAILS Page _____ of _____

Company Name: GHD	Contact Name: Lachlan Parkinson	Purchase Order: 12584780	COC Number:
Office Address: L3, 24 Honeysuckle Drive Newcastle 2300	Project Manager: Leslie Maranciak	PROJECT Number: 12584780	Eurofins | mgt quote ID: 180501GHD
Email for results: Lachlan.Parkinson@ghd.com Leslie.Maranciak@ghd.com		PROJECT Name: Aurizon Hexham Water Monitoring	Data output format: ESDAT

Special Directions & Comments:
Please ensure fecal coliforms are reported in CFU/100ml

Eurofins | mgt DI water batch number:

Sample ID	Date	Matrix	B4 (BTEXN / TRH / PAH)	Dissolved Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	State BTBA (Nutrients, Total N (TKN, NOX), Total P)	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day	Send to ALS - same analysis as FD01 at ALS please
1	MW01R	15/6/22	W	X	X	X	X	X	X	
2	101R		W	X	X	X	X	X	X	
3	MW101R		W	X	X	X	X	X	X	
4	MW106R		W	X	X	X	X	X	X	
5	MW108R		W	X	X	X	X	X	X	
6	MW109		W	X	X	X	X	X	X	
7	MW301R		W	X	X	X	X	X	X	
8	MW02		W	X	X	X	X	X	X	
9	MW307R		W	X	X	X	X	X	X	
10	MW308R		W	X	X	X	X	X	X	
11	MW302R		W	X	X	X	X	X	X	
12	FD01		W	X	X		X			
13	FD02		W							X
14	RB01		W	X	X		X			
15										
16										
17										

Environmental Division
Melbourne
Work Order Reference
EM2211420



Telephone: +61-3-9549 9600

Some common holding times (with correct preservation). For further information contact the lab			
Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous Iron	7 days	ASLP, TCLP	7 days

Containers:							Sample comments:
1LP	250P	125P	1LA	40mL ual	125mL A	Jar	

Relinquished By: L. Parkinson	Received By: Jason Slongora	Turn around time: 1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/> 5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:	Method Of Shipment: <input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal Carrier	Temperature on arrival: 8.3
Date & Time: 15/6/22	Date & Time: 15/6/22 2:43 PM	Received: 16:41 16/6/22	RELINQUISHED BY: EVAN G. 16/6/22 2:40 PM	Report number:
Signature: [Signature]	Signature: [Signature]			

Note: Temp: 9.4 °C Seal: [mark] S.R.

ANALYTICAL REPORT

REPORT CODE

AR-22-NV-008743-01

REPORT DATE

08/07/2022

Eurofins Environment Testing Australia Pty Ltd

For the attention of

Analytical Reports

6 Monterey Road

Dandenong South

3175 Melbourne

AUSTRALIA



Phone

Email EnviroReportsau@eurofins.com

Contact for your orders:

Ruvini Herath

Order code:

EUAUTWU-00019393

Submission Reference:

Merged from order
cau001-order-903555-220707.xml

Purchase Order Number:

903555

SAMPLE CODE

726-2022-00024459

Client Reference:

22-JI0010815

Sample described as:

SW1

Reception Date:

07/07/2022

Analysis Starting Date:

07/07/2022

Sampled Date & Time

06/07/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

08/07/2022

RESULTS

LOQ

VQ792 Thermotolerant Coliforms

Analysis Starting Date: 7/07/2022 10:00

Thermotolerant coliforms 25 cfu/ml

1

SAMPLE CODE

726-2022-00024460

Client Reference:

22-JI0010816

Sample described as:

SW4

Reception Date:

07/07/2022

Analysis Starting Date:

07/07/2022

Sampled Date & Time

06/07/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

08/07/2022

RESULTS

LOQ

VQ792 Thermotolerant Coliforms

Analysis Starting Date: 7/07/2022 10:00

Thermotolerant coliforms 15 cfu/ml

1

SAMPLE CODE

726-2022-00024461

Client Reference:

22-JI0010817

Sample described as:

SW4A

Reception Date:

07/07/2022

Analysis Starting Date:

07/07/2022

Sampled Date & Time

06/07/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

08/07/2022

RESULTS

LOQ

VQ792 Thermotolerant Coliforms

Analysis Starting Date: 7/07/2022 10:00

Thermotolerant coliforms 90 cfu/ml

1

Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
Dandenong South
Melbourne
VIC 3175
AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/food-testing>

Accredited for compliance with ISO/IEC 17025 - Testing

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Accreditation Number 20293



SAMPLE CODE 726-2022-00024462

Client Reference: 22-JI0010818
Sample described as: SW5
Reception Date: 07/07/2022
Analysis Starting Date: 07/07/2022
Sampled Date & Time: 06/07/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 08/07/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 7/07/2022 10:00

Thermotolerant coliforms	4	cfu/ml	1
--------------------------	---	--------	---

SAMPLE CODE 726-2022-00024463

Client Reference: 22-JI0010819
Sample described as: SW6
Reception Date: 07/07/2022
Analysis Starting Date: 07/07/2022
Sampled Date & Time: 06/07/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 08/07/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 7/07/2022 10:00

Thermotolerant coliforms	14	cfu/10 ml	1
--------------------------	----	-----------	---

SAMPLE CODE 726-2022-00024464

Client Reference: 22-JI0010820
Sample described as: SW7
Reception Date: 07/07/2022
Analysis Starting Date: 07/07/2022
Sampled Date & Time: 06/07/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 08/07/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 7/07/2022 10:00

Thermotolerant coliforms	24	cfu/10 ml	1
--------------------------	----	-----------	---

SAMPLE CODE 726-2022-00024465

Client Reference: 22-JI0010821
Sample described as: BASIN 1
Reception Date: 07/07/2022
Analysis Starting Date: 07/07/2022
Sampled Date & Time: 06/07/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 08/07/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 7/07/2022 10:00

Thermotolerant coliforms	18	cfu/ml	1
--------------------------	----	--------	---

SAMPLE CODE 726-2022-00024466

Client Reference: 22-JI0010822
Sample described as: BASIN 2
Reception Date: 07/07/2022
Analysis Starting Date: 07/07/2022
Sampled Date & Time: 06/07/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 08/07/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 7/07/2022 10:00

Thermotolerant coliforms	10	cfu/ml	1
--------------------------	----	--------	---

SAMPLE CODE 726-2022-00024467

Client Reference: 22-JI0010823
Sample described as: BASIN 3
Reception Date: 07/07/2022
Analysis Starting Date: 07/07/2022
Sampled Date & Time: 06/07/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 08/07/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 7/07/2022 10:00

Thermotolerant coliforms	5	cfu/ml	1
--------------------------	---	--------	---

LIST OF METHODS

 VQ792 **Thermotolerant Coliforms:** AS 4276.7

Signature

Di Shen Scientist

EXPLANATORY NOTE

- ◆ Test is not accredited
- Test is subcontracted within Eurofins group and is accredited
- Test is subcontracted within Eurofins group and is not accredited
- Test is subcontracted outside Eurofins group and is accredited
- Test is subcontracted outside Eurofins group and is not accredited

N/A means Not applicable

Not Detected means not detected at or above the Limit of Quantification (LOQ)

LOQ Limit of Quantification

U Measurement Uncertainty

< Less than, ≤ Less than or equal to

> Greater than, ≥ Greater than or equal to

The tests are identified by a 5 digit code, full details can be provided on request.

Information supplied by the client. This information can have an impact on the validity of results.

Samples are tested as received and the results relate only to the sample tested.

Analysis date is reported as the start date of extraction for a method.

The results may not be reproduced except in full, without a written approval from the laboratory.

Eurofins General Terms and Conditions apply.

END OF REPORT

Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/food-testing>

Accredited for compliance with ISO/IEC
 17025 - Testing

NATA is a signatory to the ILAC Mutual
 Recognition Arrangement for the mutual
 recognition of the equivalence of testing,
 medical testing, calibration, inspection,
 proficiency testing scheme providers and
 reference materials producers reports and
 certificates.

Accreditation Number 20293



GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **Leslie Maranciak**

Report **903555-W**
Project name **AURIZON HEXHAM WATER MONITORING**
Project ID **12584780**
Received Date **Jul 06, 2022**

Client Sample ID			SW1 Water N22-JI0010815 Jul 06, 2022	SW4 Water N22-JI0010816 Jul 06, 2022	SW4A Water N22-JI0010817 Jul 06, 2022	SW5 Water N22-JI0010818 Jul 06, 2022
Sample Matrix	LOR	Unit				
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	0.2	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	0.2	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	99	105	92	98
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			SW1 Water N22-JI0010815 Jul 06, 2022	SW4 Water N22-JI0010816 Jul 06, 2022	SW4A Water N22-JI0010817 Jul 06, 2022	SW5 Water N22-JI0010818 Jul 06, 2022
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	103	130	56	120
p-Terphenyl-d14 (surr.)	1	%	86	67	99	92
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	0.1	< 0.1	< 0.1	< 0.1
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	0.09	0.16	0.14	0.30
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 20	< 5	< 5	15
Conductivity (at 25°C)						
Conductivity (at 25°C)	10	uS/cm	230	570	580	570
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	0.12	0.34	0.37	0.06
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	6.7	7.2	7.0	7.0
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	1.9	3.8	5.0	2.0
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	74	2.2	2.1	3.5
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.1	mg/L	74.12	2.54	2.47	3.56
Total Suspended Solids Dried at 103°C–105°C						
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	660	77	230	390
Turbidity						
Turbidity	1	NTU	51	68	370	1100
Heavy Metals						
Aluminium	0.05	mg/L	4.1	0.25	0.28	1.6
Arsenic	0.001	mg/L	0.012	0.002	0.007	0.037
Cadmium	0.0002	mg/L	< 0.002	< 0.0002	< 0.0002	< 0.002
Chromium	0.001	mg/L	< 0.01	< 0.001	< 0.001	< 0.01
Copper	0.001	mg/L	0.025	0.003	0.003	0.014
Iron	0.05	mg/L	19	5.7	36	180
Lead	0.001	mg/L	0.021	< 0.001	0.001	< 0.01
Mercury	0.0001	mg/L	< 0.001	< 0.0001	< 0.0001	< 0.001
Nickel	0.001	mg/L	0.015	0.002	0.002	0.048
Zinc	0.005	mg/L	0.14	0.014	0.017	0.051
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			SW6 Water N22-JI0010819 Jul 06, 2022	SW7 Water N22-JI0010820 Jul 06, 2022	BASIN 1 Water N22-JI0010821 Jul 06, 2022	BASIN 2 Water N22-JI0010822 Jul 06, 2022
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			SW6	SW7	BASIN 1	BASIN 2
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			N22-JI0010819	N22-JI0010820	N22-JI0010821	N22-JI0010822
Date Sampled			Jul 06, 2022	Jul 06, 2022	Jul 06, 2022	Jul 06, 2022
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	92	90	86	78
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	76	54	73	50
p-Terphenyl-d14 (surr.)	1	%	145	88	119	93
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	0.04	0.03	0.05	0.02
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	< 5	< 5	< 5
Conductivity (at 25°C)						
Conductivity (at 25°C)	10	uS/cm	370	450	180	320
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	0.07	< 0.05	0.13
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	6.8	6.9	7.3	6.9
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.06	0.19	0.57	0.51
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	< 0.2	< 0.2	0.6	< 0.2
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.1	mg/L	< 0.2	< 0.2	0.6	< 0.2
Total Suspended Solids Dried at 103°C–105°C						
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	< 5	5.6	12	5.3
Turbidity						
Turbidity	1	NTU	5.7	6.6	3.6	4.7

Client Sample ID			SW6	SW7	BASIN 1	BASIN 2
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			N22-JI0010819	N22-JI0010820	N22-JI0010821	N22-JI0010822
Date Sampled			Jul 06, 2022	Jul 06, 2022	Jul 06, 2022	Jul 06, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	0.09	0.12	0.15	0.09
Arsenic	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.001
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	0.001	0.001	0.002
Iron	0.05	mg/L	0.51	0.42	0.23	0.48
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.003	0.001	< 0.001	0.004
Zinc	0.005	mg/L	< 0.005	0.013	0.005	< 0.005
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			BASIN 3
Sample Matrix			Water
Eurofins Sample No.			N22-JI0010823
Date Sampled			Jul 06, 2022
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	93
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.01	mg/L	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001

Client Sample ID			BASIN 3
Sample Matrix			Water
Eurofins Sample No.			N22-JI0010823
Date Sampled			Jul 06, 2022
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	80
p-Terphenyl-d14 (surr.)	1	%	55
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
Ammonia (as N)			
Ammonia (as N)	0.01	mg/L	< 0.01
Biochemical Oxygen Demand (BOD-5 Day)			
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5
Conductivity (at 25°C)			
Conductivity (at 25°C)	10	uS/cm	100
Nitrate & Nitrite (as N)			
Nitrate & Nitrite (as N)	0.05	mg/L	0.06
pH (at 25 °C)			
pH (at 25 °C)	0.1	pH Units	6.9
Phosphate total (as P)			
Phosphate total (as P)	0.01	mg/L	0.32
Total Kjeldahl Nitrogen (as N)			
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	1.3
Total Nitrogen (as N)*			
Total Nitrogen (as N)*	0.1	mg/L	1.36
Total Suspended Solids Dried at 103°C–105°C			
Total Suspended Solids Dried at 103°C–105°C	5	mg/L	5.8
Turbidity			
Turbidity	1	NTU	7.5
Heavy Metals			
Aluminium	0.05	mg/L	0.13
Arsenic	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Copper	0.001	mg/L	0.002
Iron	0.05	mg/L	0.35
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	0.003
Zinc	0.005	mg/L	0.005
Pathogens			
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Jul 07, 2022	7 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Melbourne	Jul 07, 2022	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Jul 07, 2022	7 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Jul 07, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Jul 07, 2022	7 Days
Ammonia (as N) - Method: APHA 4500-NH3 Ammonia Nitrogen by FIA	Melbourne	Jul 07, 2022	28 Days
Biochemical Oxygen Demand (BOD-5 Day) - Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water	Melbourne	Jul 07, 2022	2 Days
Conductivity (at 25°C) - Method: LTM-INO-4030 Conductivity	Melbourne	Jul 07, 2022	28 Days
pH (at 25 °C) - Method: LTM-GEN-7090 pH in water by ISE	Melbourne	Jul 07, 2022	0 Hours
Total Suspended Solids Dried at 103°C–105°C - Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry	Melbourne	Jul 07, 2022	7 Days
Turbidity - Method: Turbidity by classical using APHA 2130B (LTM-INO-4140)	Melbourne	Jul 08, 2022	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Jul 07, 2022	28 Days
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N) - Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA	Melbourne	Jul 07, 2022	28 Days
Total Kjeldahl Nitrogen (as N) - Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA	Melbourne	Jul 07, 2022	28 Days
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphate total (as P) - Method: LTM-INO-4040 Phosphate by CFA	Melbourne	Jul 08, 2022	28 Days

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780

Order No.:
Report #: 903555
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Jul 6, 2022 12:31 PM
Due: Jul 13, 2022
Priority: 5 Day
Contact Name: Leslie Maranciak

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Ammonia (as N)	Arsenic	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Chromium	Conductivity (at 25°C)	Copper	Iron	Lead	Mercury	Nickel	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103°C-105°C	Turbidity	Zinc	Eurofins Suite B4	Eurofins Suite B19A: Total N (TKN, NOx), Total P
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
External Laboratory																		X						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																			
1	SW1	Jul 06, 2022		Water	N22-JI0010815	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	SW4	Jul 06, 2022		Water	N22-JI0010816	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	SW4A	Jul 06, 2022		Water	N22-JI0010817	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	SW5	Jul 06, 2022		Water	N22-JI0010818	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	SW6	Jul 06, 2022		Water	N22-JI0010819	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	SW7	Jul 06, 2022		Water	N22-JI0010820	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	BASIN 1	Jul 06, 2022		Water	N22-JI0010821	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	BASIN 2	Jul 06, 2022		Water	N22-JI0010822	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9	BASIN 3	Jul 06, 2022		Water	N22-JI0010823	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	mg/L	< 5			5	Pass	
Conductivity (at 25°C)	uS/cm	< 10			10	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Phosphate total (as P)	mg/L	< 0.01			0.01	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Total Suspended Solids Dried at 103°C–105°C	mg/L	< 5			5	Pass	
Turbidity	NTU	< 1			1	Pass	
Method Blank							
Heavy Metals							

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Aluminium	mg/L	< 0.05		0.05	Pass	
Arsenic	mg/L	< 0.001		0.001	Pass	
Cadmium	mg/L	< 0.0002		0.0002	Pass	
Chromium	mg/L	< 0.001		0.001	Pass	
Copper	mg/L	< 0.001		0.001	Pass	
Iron	mg/L	< 0.05		0.05	Pass	
Lead	mg/L	< 0.001		0.001	Pass	
Mercury	mg/L	< 0.0001		0.0001	Pass	
Nickel	mg/L	< 0.001		0.001	Pass	
Zinc	mg/L	< 0.005		0.005	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	%	96		70-130	Pass	
TRH C10-C14	%	104		70-130	Pass	
LCS - % Recovery						
BTEX						
Benzene	%	76		70-130	Pass	
Toluene	%	86		70-130	Pass	
Ethylbenzene	%	79		70-130	Pass	
m&p-Xylenes	%	78		70-130	Pass	
Xylenes - Total*	%	78		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene	%	81		70-130	Pass	
TRH C6-C10	%	100		70-130	Pass	
LCS - % Recovery						
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	%	112		70-130	Pass	
Acenaphthylene	%	99		70-130	Pass	
Anthracene	%	76		70-130	Pass	
Benz(a)anthracene	%	102		70-130	Pass	
Benzo(a)pyrene	%	76		70-130	Pass	
Benzo(b&j)fluoranthene	%	127		70-130	Pass	
Benzo(g,h,i)perylene	%	124		70-130	Pass	
Benzo(k)fluoranthene	%	124		70-130	Pass	
Chrysene	%	74		70-130	Pass	
Dibenz(a,h)anthracene	%	104		70-130	Pass	
Fluoranthene	%	103		70-130	Pass	
Fluorene	%	103		70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	108		70-130	Pass	
Naphthalene	%	97		70-130	Pass	
Phenanthrene	%	99		70-130	Pass	
Pyrene	%	74		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	%	106		70-130	Pass	
LCS - % Recovery						
Ammonia (as N)	%	99		70-130	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	%	92		85-115	Pass	
Conductivity (at 25°C)	%	91		70-130	Pass	
Nitrate & Nitrite (as N)	%	82		70-130	Pass	
Phosphate total (as P)	%	113		70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	102		70-130	Pass	
Total Suspended Solids Dried at 103°C–105°C	%	108		70-130	Pass	

Test				Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery									
Heavy Metals									
Aluminium				%	97		80-120	Pass	
Arsenic				%	92		80-120	Pass	
Cadmium				%	96		80-120	Pass	
Chromium				%	90		80-120	Pass	
Copper				%	92		80-120	Pass	
Iron				%	93		80-120	Pass	
Lead				%	101		80-120	Pass	
Mercury				%	93		80-120	Pass	
Nickel				%	93		80-120	Pass	
Zinc				%	95		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					Result 1				
TRH C6-C9	M22-JI0014578	NCP	%	94			70-130	Pass	
TRH C10-C14	M22-JI0013824	NCP	%	87			70-130	Pass	
Spike - % Recovery									
BTEX					Result 1				
Benzene	M22-JI0014578	NCP	%	86			70-130	Pass	
Toluene	M22-JI0014578	NCP	%	87			70-130	Pass	
Ethylbenzene	M22-JI0014578	NCP	%	85			70-130	Pass	
m&p-Xylenes	M22-JI0014578	NCP	%	86			70-130	Pass	
o-Xylene	M22-JI0014578	NCP	%	86			70-130	Pass	
Xylenes - Total*	M22-JI0014578	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1				
Naphthalene	M22-JI0014578	NCP	%	73			70-130	Pass	
TRH C6-C10	M22-JI0014578	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1				
TRH >C10-C16	M22-JI0013824	NCP	%	89			70-130	Pass	
Spike - % Recovery									
					Result 1				
Total Kjeldahl Nitrogen (as N)	M22-JI0012741	NCP	%	114			70-130	Pass	
Spike - % Recovery									
Heavy Metals					Result 1				
Aluminium	M22-JI0003641	NCP	%	90			75-125	Pass	
Arsenic	M22-JI0003641	NCP	%	90			75-125	Pass	
Cadmium	M22-JI0003641	NCP	%	91			75-125	Pass	
Chromium	M22-JI0003641	NCP	%	90			75-125	Pass	
Copper	M22-JI0003641	NCP	%	90			75-125	Pass	
Iron	M22-JI0003641	NCP	%	71			75-125	Fail	Q08
Lead	M22-JI0003641	NCP	%	93			75-125	Pass	
Mercury	M22-JI0003641	NCP	%	93			75-125	Pass	
Nickel	M22-JI0003641	NCP	%	89			75-125	Pass	
Zinc	M22-JI0003641	NCP	%	77			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons					Result 1				
Acenaphthene	M22-JI0021362	NCP	%	117			70-130	Pass	
Acenaphthylene	M22-JI0021362	NCP	%	85			70-130	Pass	
Anthracene	M22-JI0021362	NCP	%	112			70-130	Pass	
Benz(a)anthracene	M22-JI0021362	NCP	%	85			70-130	Pass	
Benzo(b&j)fluoranthene	M22-JI0021362	NCP	%	86			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g,h,i)perylene	M22-JI0021362	NCP	%	81			70-130	Pass	
Benzo(k)fluoranthene	M22-JI0021362	NCP	%	74			70-130	Pass	
Chrysene	M22-JI0021362	NCP	%	114			70-130	Pass	
Dibenz(a,h)anthracene	M22-JI0021362	NCP	%	94			70-130	Pass	
Fluoranthene	M22-JI0021362	NCP	%	71			70-130	Pass	
Fluorene	M22-JI0021362	NCP	%	97			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M22-JI0021362	NCP	%	72			70-130	Pass	
Naphthalene	M22-JI0021362	NCP	%	117			70-130	Pass	
Phenanthrene	M22-JI0021362	NCP	%	85			70-130	Pass	
Pyrene	M22-JI0021362	NCP	%	75			70-130	Pass	
Spike - % Recovery									
				Result 1					
Phosphate total (as P)	N22-JI0010821	CP	%	100			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M22-JI0014575	NCP	mg/L	0.02	0.04	50	30%	Fail	Q15
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M22-JI0014575	NCP	mg/L	0.005	0.005	3.5	30%	Pass	
Toluene	M22-JI0014575	NCP	mg/L	0.008	0.008	8.2	30%	Pass	
Ethylbenzene	M22-JI0014575	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M22-JI0014575	NCP	mg/L	0.005	0.006	1.5	30%	Pass	
o-Xylene	M22-JI0014575	NCP	mg/L	0.002	0.002	9.3	30%	Pass	
Xylenes - Total*	M22-JI0014575	NCP	mg/L	0.007	0.007	3.4	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M22-JI0014575	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M22-JI0014575	NCP	mg/L	0.03	0.04	47	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
Biochemical Oxygen Demand (BOD-5 Day)	M22-JI0010589	NCP	mg/L	< 5	< 5	<1	30%	Pass	
Phosphate total (as P)	B22-JI0014251	NCP	mg/L	0.07	0.07	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	M22-JI0003641	NCP	mg/L	0.98	0.98	<1	30%	Pass	
Arsenic	M22-JI0003641	NCP	mg/L	0.014	0.014	<1	30%	Pass	
Cadmium	M22-JI0003641	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M22-JI0003641	NCP	mg/L	0.003	0.003	<1	30%	Pass	
Copper	M22-JI0003641	NCP	mg/L	0.002	0.002	<1	30%	Pass	
Iron	M22-JI0003641	NCP	mg/L	2.4	2.4	<1	30%	Pass	
Lead	M22-JI0003641	NCP	mg/L	0.001	0.001	<1	30%	Pass	
Mercury	M22-JI0003641	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M22-JI0003641	NCP	mg/L	0.002	0.002	<1	30%	Pass	
Zinc	M22-JI0003641	NCP	mg/L	0.022	0.022	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (at 25°C)	N22-JI0010816	CP	uS/cm	570	550	2.7	30%	Pass	
pH (at 25 °C)	N22-JI0010816	CP	pH Units	7.2	7.3	pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Suspended Solids Dried at 103°C–105°C	N22-JI0010818	CP	mg/L	390	330	16	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g,h,i)perylene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a,h)anthracene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M22-JI0018332	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	N22-JI0010822	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	N22-JI0010822	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	N22-JI0010822	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	N22-JI0010822	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	N22-JI0010822	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	N22-JI0010822	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Turbidity	N22-JI0010822	CP	NTU	4.7	4.3	9.3	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	N22-JI0010823	CP	mg/L	< 0.01	0.07	200	30%	Fail	Q15
Nitrate & Nitrite (as N)	N22-JI0010823	CP	mg/L	0.06	0.06	2.0	30%	Pass	
Total Kjeldahl Nitrogen (as N)	N22-JI0010823	CP	mg/L	1.3	1.1	17	30%	Pass	

Comments

Thermotolerant coliforms analysed by; Eurofins Food testing; accreditation number 20293; report reference AR-22-NV-008743-01

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Andrew Black	Analytical Services Manager
Edward Lee	Senior Analyst-Organic
Joseph Edouard	Senior Analyst-Organic
Mary Makarios	Senior Analyst-Inorganic
Scott Beddoes	Senior Analyst-Inorganic
Scott Beddoes	Senior Analyst-Metal
Vivian Wang	Senior Analyst-Volatile



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne 6 Monterey Road Dandenong South VIC 3175 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Geelong 19/8 Lewalan Street Grovedale VIC 3216 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Sydney 179 Magowar Road Girraween NSW 2145 Tel: +61 2 9900 8400 NATA# 1261 Site# 18217
---	---	--

Canberra Unit 1,2 Dacre Street Mitchell ACT 2911 Tel: +61 2 6113 8091	Brisbane 1/21 Smallwood Place Murarie QLD 4172 Tel: +61 7 3902 4600 NATA# 1261 Site# 20794	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Tel: +61 2 4968 8448 NATA# 1261 Site# 25079
--	--	---

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth 46-48 Banksia Road Welshpool WA 6106 Tel: +61 8 6253 4444 NATA# 2377 Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland 35 O'Rorke Road Penrose, Auckland 1061 Tel: +64 9 526 45 51 IANZ# 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Tel: 0800 856 450 IANZ# 1290
---	---

Sample Receipt Advice

Company name:	GHD Pty Ltd NEWCASTLE
Contact name:	Leslie Maranciak
Project name:	AURIZON HEXHAM WATER MONITORING
Project ID:	12584780
Turnaround time:	5 Day
Date/Time received	Jul 6, 2022 12:31 PM
Eurofins reference	903555

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 9.3 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✓ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Leslie Maranciak - leslie.maranciak@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NEWCASTLE email address.



mgt

Sydney

Unit F3 + 6 Building F, 18 Macquarie Road, Lane Cove
Phone: +612 9930 8400
Email: onwiro.syd@mgt@abmark.com.au

Brisbane

Unit 1-21 Smallwood Place, Murrumbidgee
Phone: +617 3902 4600
Email: onwiro.bris@mgt@abmark.com.au

Melbourne

2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 6030 Fax: +613 8564 5000
Email: onwiro.mel@mgt@abmark.com.au

CHAIN OF CUSTODY RECORD

Page 1 of 1

CLIENT DETAILS

Company Name: GHD	Contact Name: Lachlan Parkinson	Purchase Order: 12584780	COC Number:
Office Address: L3, 24 Hone Muckle Drive Newcastle 2300	Project Manager: Leslie Maranciak	PROJECT Number: 12584780	Eurofins | mgt quote ID: 120501GHD
	Email for results: Leslie.Maranciak@ghd.com Lachlan.Parkinson@ghd.com	PROJECT Name: Aurizon Hexham Water Monitoring	Date output format: ESDAT

Special Directions & Comments:

Please ensure fecal coliforms are reported in CFU/100ml

Eurofins | mgt | DI water batch number:

Sample ID	Date	Matrix	Analytes										Containers:		Sample comments:			
			B4 (BTEX / TRH / PAH)	Total Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	Sulfate B10a (Nitrates, Nitrite, Nitrogen, NOX), Total P	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day	1LP	250P	125P	1LA	40ml. var		125ml. A	Jar	
1	6/7/22	W	X	X	X	X	X	X	X	X	X	X						
2		W	X	X	X	X	X	X	X	X	X	X						
3		W	X	X	X	X	X	X	X	X	X	X						
4		W	X	X	X	X	X	X	X	X	X	X						
5		W	X	X	X	X	X	X	X	X	X	X						
6		W	X	X	X	X	X	X	X	X	X	X						
7		W	X	X	X	X	X	X	X	X	X	X						
8		W	X	X	X	X	X	X	X	X	X	X						
9		W	X	X	X	X	X	X	X	X	X	X						
10		W	X	X	X	X	X	X	X	X	X	X						
11		W	X	X	X	X	X	X	X	X	X	X						
12		W	X	X	X	X	X	X	X	X	X	X						
13		W	X	X	X	X	X	X	X	X	X	X						
14		W	X	X	X	X	X	X	X	X	X	X						
15		W	X	X	X	X	X	X	X	X	X	X						
16																		
17																		
18																		
19																		
20																		

Relinquished By: L. Parkinson	Received By: <i>Daylyn Stojanovic</i>	Turn around time	Method Of Shipment	Temperature on arrival: 9.3
Date & Time: 6/7/22	Date & Time: 12/31 6/7/22	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>	<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal	Report number: 903550
Signature: <i>LL</i>	Signature: <i>[Signature]</i>	5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:	Courier Consignment #:	

ANALYTICAL REPORT

REPORT CODE
AR-22-NV-011576-01
REPORT DATE
03/09/2022

Eurofins Environment Testing Australia Pty Ltd

For the attention of

Analytical Reports

6 Monterey Road

Dandenong South

3175 Melbourne

AUSTRALIA

Phone
Email EnviroReportsau@eurofins.com

Contact for your orders:

Ruvini Herath

Order code:

EUAUTWU-00021881

Submission Reference:

 Merged from order
cau001-order-919901-220902.xml

Purchase Order Number:

919901

SAMPLE CODE
726-2022-00032403
Client Reference:

22-Se0002866

Sample described as:

MW01R

Reception Date:

02/09/2022

Analysis Starting Date:

02/09/2022

Sampled Date & Time

01/09/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms

<1 cfu/10 ml

1

SAMPLE CODE
726-2022-00032404
Client Reference:

22-Se0002867

Sample described as:

101R

Reception Date:

02/09/2022

Analysis Starting Date:

02/09/2022

Sampled Date & Time

01/09/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms

<1 cfu/10 ml

1

SAMPLE CODE
726-2022-00032405
Client Reference:

22-Se0002868

Sample described as:

MW101R

Reception Date:

02/09/2022

Analysis Starting Date:

02/09/2022

Sampled Date & Time

01/09/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms

26 cfu/10 ml

1

Eurofins Food Testing Australia Pty Ltd

 6 Monterey Road
Dandenong South
Melbourne
VIC 3175
AUSTRALIA

Phone +61385645000

https://www.eurofins.com.au/food-testing

 Accredited for compliance with ISO/IEC
17025 - Testing

 NATA is a signatory to the ILAC Mutual
Recognition Arrangement for the mutual
recognition of the equivalence of testing,
medical testing, calibration, inspection,
proficiency testing scheme providers and
reference materials producers reports and
certificates.

Accreditation Number 20293



SAMPLE CODE 726-2022-00032406

Client Reference: 22-Se0002869
Sample described as: MW106R
Reception Date: 02/09/2022
Analysis Starting Date: 02/09/2022
Sampled Date & Time: 01/09/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

SAMPLE CODE 726-2022-00032407

Client Reference: 22-Se0002870
Sample described as: MW108R
Reception Date: 02/09/2022
Analysis Starting Date: 02/09/2022
Sampled Date & Time: 01/09/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

SAMPLE CODE 726-2022-00032408

Client Reference: 22-Se0002871
Sample described as: MW109
Reception Date: 02/09/2022
Analysis Starting Date: 02/09/2022
Sampled Date & Time: 01/09/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms	4	cfu/ml	1
--------------------------	---	--------	---

SAMPLE CODE 726-2022-00032409

Client Reference: 22-Se0002872
Sample described as: MW301R
Reception Date: 02/09/2022
Analysis Starting Date: 02/09/2022
Sampled Date & Time: 01/09/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

SAMPLE CODE 726-2022-00032410

Client Reference: 22-Se0002873
Sample described as: MW02
Reception Date: 02/09/2022
Analysis Starting Date: 02/09/2022
Sampled Date & Time: 01/09/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms	<1	cfu/10 ml	1
--------------------------	----	-----------	---

SAMPLE CODE 726-2022-00032411

Client Reference: 22-Se0002874
Sample described as: MW307R
Reception Date: 02/09/2022
Analysis Starting Date: 02/09/2022
Sampled Date & Time: 01/09/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

SAMPLE CODE 726-2022-00032412

Client Reference: 22-Se0002875
Sample described as: MW308R
Reception Date: 02/09/2022
Analysis Starting Date: 02/09/2022
Sampled Date & Time: 01/09/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

SAMPLE CODE 726-2022-00032413

Client Reference: 22-Se0002876
Sample described as: MW302R
Reception Date: 02/09/2022
Analysis Starting Date: 02/09/2022
Sampled Date & Time: 01/09/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms	1	cfu/ml	1
--------------------------	---	--------	---

SAMPLE CODE 726-2022-00032414

Client Reference: 22-Se0002879
Sample described as: SW9
Reception Date: 02/09/2022
Analysis Starting Date: 02/09/2022
Sampled Date & Time: 01/09/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms	<1	cfu/10 ml	1
--------------------------	----	-----------	---

SAMPLE CODE 726-2022-00032415

Client Reference: 22-Se0002880
Sample described as: BASIN 1
Reception Date: 02/09/2022
Analysis Starting Date: 02/09/2022
Sampled Date & Time: 01/09/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms	3	cfu/ml	1
--------------------------	---	--------	---

SAMPLE CODE 726-2022-00032416

Client Reference: 22-Se0002881
Sample described as: BASIN 2
Reception Date: 02/09/2022
Analysis Starting Date: 02/09/2022
Sampled Date & Time: 01/09/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

SAMPLE CODE 726-2022-00032417

Client Reference: 22-Se0002882
Sample described as: BASIN 3
Reception Date: 02/09/2022
Analysis Starting Date: 02/09/2022
Sampled Date & Time: 01/09/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 03/09/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 2/09/2022 10:00

Thermotolerant coliforms	2	cfu/ml	1
--------------------------	---	--------	---

LIST OF METHODS

VQ792 Thermotolerant Coliforms: AS 4276.7

Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/food-testing>

Accredited for compliance with ISO/IEC 17025 - Testing
 NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
 Accreditation Number 20293



Signature



Di Shen Scientist

EXPLANATORY NOTE

- ◆ Test is not accredited
- Test is subcontracted within Eurofins group and is accredited
- Test is subcontracted within Eurofins group and is not accredited
- Test is subcontracted outside Eurofins group and is accredited
- Test is subcontracted outside Eurofins group and is not accredited

N/A means Not applicable

Not Detected means not detected at or above the Limit of Quantification (LOQ)

LOQ Limit of Quantification

U Measurement Uncertainty

< Less than, ≤ Less than or equal to

> Greater than, ≥ Greater than or equal to

The tests are identified by a 5 digit code, full details can be provided on request.

Information supplied by the client. This information can have an impact on the validity of results.

Samples are tested as received and the results relate only to the sample tested.

Analysis date is reported as the start date of extraction for a method.

The results may not be reproduced except in full, without a written approval from the laboratory.

Eurofins General Terms and Conditions apply.

END OF REPORT

Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/food-testing>

Accredited for compliance with ISO/IEC 17025 - Testing

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Accreditation Number 20293



GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **Leslie Maranciak**

Report **919901-W**
Project name **AURIZON HEXHAM WATER MONITORING**
Project ID **12584780**
Received Date **Sep 01, 2022**

Client Sample ID			MW01R	101R	MW101R	MW106R
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Se0002866	M22- Se0002867	M22- Se0002868	M22- Se0002869
Date Sampled			Sep 01, 2022	Sep 01, 2022	Sep 01, 2022	Sep 01, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	121	123	96	98
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			MW01R	101R	MW101R	MW106R
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Se0002866	M22- Se0002867	M22- Se0002868	M22- Se0002869
Date Sampled			Sep 01, 2022	Sep 01, 2022	Sep 01, 2022	Sep 01, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	95	65	71	88
p-Terphenyl-d14 (surr.)	1	%	127	96	52	117
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	0.47	3.9	1.1	< 0.01
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	22	< 5	< 5	< 5
Conductivity (at 25 °C)						
Conductivity (at 25 °C)	10	uS/cm	3600	9300	11000	500
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	0.29
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	6.0	7.7	7.5	7.8
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	< 0.01	0.03	< 0.01	0.14
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	2.1	7.5	4.8	1.6
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	2.1	7.5	4.8	1.89
Total Suspended Solids Dried at 103 °C to 105 °C						
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	58	160	390	36
Turbidity						
Turbidity	1	NTU	63	28	61	28
Heavy Metals						
Aluminium (filtered)						
Aluminium (filtered)	0.05	mg/L	0.16	< 0.05	< 0.05	< 0.05
Arsenic (filtered)						
Arsenic (filtered)	0.001	mg/L	0.001	< 0.001	0.008	< 0.001
Cadmium (filtered)						
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)						
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)						
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.003
Iron (filtered)						
Iron (filtered)	0.05	mg/L	170	7.2	18	< 0.05
Lead (filtered)						
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)						
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)						
Nickel (filtered)	0.001	mg/L	0.044	< 0.001	< 0.001	0.003
Zinc (filtered)						
Zinc (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	0.014
Pathogens						
Thermotolerant Coliforms (CFU)						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			MW108R	MW109	MW301R	MW02
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Se0002870	M22- Se0002871	M22- Se0002872	M22- Se0002873
Date Sampled			Sep 01, 2022	Sep 01, 2022	Sep 01, 2022	Sep 01, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene^{N02}						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			MW108R	MW109	MW301R	MW02
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Se0002870	M22- Se0002871	M22- Se0002872	M22- Se0002873
Date Sampled			Sep 01, 2022	Sep 01, 2022	Sep 01, 2022	Sep 01, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	92	91	123	126
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	53	127	134	92
p-Terphenyl-d14 (surr.)	1	%	110	81	82	114
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	0.16	0.53	2.9	1.7
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	< 5	< 5	8.2
Conductivity (at 25 °C)						
Conductivity (at 25 °C)	10	uS/cm	2500	4000	8900	1900
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	7.5	7.7	7.6	4.0
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.03	< 0.01	0.75	0.01
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	2.3	3.0	7.7	3.9
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	2.3	3	7.7	3.9
Total Suspended Solids Dried at 103 °C to 105 °C						
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	6.0	130	76	97
Turbidity						
Turbidity	1	NTU	13	57	61	110
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	< 0.001	0.003	0.002	0.013
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.001	< 0.001	< 0.001	0.002

Client Sample ID			MW108R	MW109	MW301R	MW02
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Se0002870	M22- Se0002871	M22- Se0002872	M22- Se0002873
Date Sampled			Sep 01, 2022	Sep 01, 2022	Sep 01, 2022	Sep 01, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Iron (filtered)	0.05	mg/L	1.2	1.6	4.9	84
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.005	0.001	0.002	0.066
Zinc (filtered)	0.005	mg/L	0.046	0.031	< 0.005	0.11
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			MW307R	MW308R	MW302R	FD01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Se0002874	M22- Se0002875	M22- Se0002876	M22- Se0002877
Date Sampled			Sep 01, 2022	Sep 01, 2022	Sep 01, 2022	Sep 01, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	142	142	142	97
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			MW307R	MW308R	MW302R	FD01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Se0002874	M22- Se0002875	M22- Se0002876	M22- Se0002877
Date Sampled			Sep 01, 2022	Sep 01, 2022	Sep 01, 2022	Sep 01, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	113	77	56	78
p-Terphenyl-d14 (surr.)	1	%	79	107	68	105
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	26	1.4	0.33	-
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	< 5	< 5	-
Conductivity (at 25 °C)						
Conductivity (at 25 °C)	10	uS/cm	26000	5100	2100	-
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	0.80	0.30	1.4	1.3
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	8.0	7.2	7.3	-
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	5.7	< 0.01	0.10	0.08
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	35	4.1	2.9	2.6
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	35.8	4.4	4.3	3.9
Total Suspended Solids Dried at 103 °C to 105 °C						
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	36	95	220	-
Turbidity						
Turbidity	1	NTU	1.5	32	150	-
Heavy Metals						
Aluminium (filtered)						
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)						
Arsenic (filtered)	0.001	mg/L	< 0.001	0.008	< 0.001	< 0.001
Cadmium (filtered)						
Cadmium (filtered)	0.0002	mg/L	< 0.0002	0.0004	< 0.0002	< 0.0002
Chromium (filtered)						
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)						
Copper (filtered)	0.001	mg/L	0.003	< 0.001	0.001	0.001
Iron (filtered)						
Iron (filtered)	0.05	mg/L	0.15	46	16	15
Lead (filtered)						
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)						
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)						
Nickel (filtered)	0.001	mg/L	0.001	0.014	0.005	0.005
Zinc (filtered)						
Zinc (filtered)	0.005	mg/L	0.012	< 0.005	0.096	0.098
Pathogens						
Thermotolerant Coliforms (CFU)						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	-

Client Sample ID			RB01	SW9	BASIN 1	BASIN 2
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Se0002878	M22- Se0002879	M22- Se0002880	M22- Se0002881
Date Sampled			Sep 01, 2022	Sep 01, 2022	Sep 01, 2022	Sep 01, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02

Client Sample ID			RB01	SW9	BASIN 1	BASIN 2
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Se0002878	M22- Se0002879	M22- Se0002880	M22- Se0002881
Date Sampled			Sep 01, 2022	Sep 01, 2022	Sep 01, 2022	Sep 01, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	90	90	135	96
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	127	108	88	110
p-Terphenyl-d14 (surr.)	1	%	99	110	80	104
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	-	0.19	< 0.01	0.14
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	-	< 5	< 5	10
Conductivity (at 25 °C)						
Conductivity (at 25 °C)	10	uS/cm	-	7800	790	2100
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	0.37	< 0.05	< 0.05
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	-	8.2	7.8	7.6
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.06	0.10	0.09	0.27
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	0.9	2.5	2.6	12
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	0.9	2.87	2.6	12
Total Suspended Solids Dried at 103 °C to 105 °C						
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	-	7.4	8.0	170
Turbidity						
Turbidity	1	NTU	-	1.8	< 1	7.7

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	RB01 Water M22- Se0002878 Sep 01, 2022	SW9 Water M22- Se0002879 Sep 01, 2022	BASIN 1 Water M22- Se0002880 Sep 01, 2022	BASIN 2 Water M22- Se0002881 Sep 01, 2022
Heavy Metals						
Aluminium	0.05	mg/L	< 0.05	0.10	< 0.05	0.31
Arsenic	0.001	mg/L	< 0.001	0.001	0.002	0.002
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.003
Iron	0.05	mg/L	< 0.05	0.72	0.17	3.4
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	< 0.001	0.001	< 0.001	0.011
Zinc	0.005	mg/L	< 0.005	< 0.005	< 0.005	0.015
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	-	see attached	see attached	see attached

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	BASIN 3 Water M22- Se0002882 Sep 01, 2022
Total Recoverable Hydrocarbons			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	95
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001

Client Sample ID			BASIN 3
Sample Matrix			Water
Eurofins Sample No.			M22- Se0002882
Date Sampled			Sep 01, 2022
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	90
p-Terphenyl-d14 (surr.)	1	%	134
Ammonia (as N)			
	0.01	mg/L	< 0.01
Biochemical Oxygen Demand (BOD-5 Day)			
	5	mg/L	< 5
Conductivity (at 25 °C)			
	10	uS/cm	2100
Nitrate & Nitrite (as N)			
	0.05	mg/L	< 0.05
pH (at 25 °C)			
	0.1	pH Units	7.3
Phosphate total (as P)			
	0.01	mg/L	0.04
Total Kjeldahl Nitrogen (as N)			
	0.2	mg/L	< 0.2
Total Nitrogen (as N)*			
	0.2	mg/L	< 0.2
Total Suspended Solids Dried at 103 °C to 105 °C			
	5	mg/L	14
Turbidity			
	1	NTU	2.2
Heavy Metals			
Aluminium	0.05	mg/L	< 0.05
Arsenic	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Copper	0.001	mg/L	< 0.001
Iron	0.05	mg/L	1.2
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	0.016
Zinc	0.005	mg/L	0.007
Pathogens			
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 03, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 03, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 03, 2022	7 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Melbourne	Sep 03, 2022	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Sep 03, 2022	7 Days
Ammonia (as N) - Method: APHA 4500-NH3 Ammonia Nitrogen by FIA	Melbourne	Sep 03, 2022	28 Days
Biochemical Oxygen Demand (BOD-5 Day) - Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water	Melbourne	Sep 03, 2022	2 Days
Conductivity (at 25 °C) - Method: LTM-INO-4030 Conductivity	Melbourne	Sep 03, 2022	28 Days
pH (at 25 °C) - Method: LTM-GEN-7090 pH in water by ISE	Melbourne	Sep 03, 2022	0 Hours
Total Suspended Solids Dried at 103 °C to 105 °C - Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry	Melbourne	Sep 03, 2022	7 Days
Turbidity - Method: Turbidity by classical using APHA 2130B (LTM-INO-4140)	Melbourne	Sep 03, 2022	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Sep 03, 2022	28 Days
Heavy Metals (filtered) - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Sep 03, 2022	180 Days
Mobil Metals : Metals M15 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Sep 03, 2022	28 Days
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N) - Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA	Melbourne	Sep 03, 2022	28 Days
Total Kjeldahl Nitrogen (as N) - Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA	Melbourne	Sep 03, 2022	28 Days
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphate total (as P) - Method: LTM-INO-4040 Phosphate by CFA	Melbourne	Sep 03, 2022	28 Days

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.:
Report #: 919901
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Sep 1, 2022 1:58 PM
Due: Sep 8, 2022
Priority: 5 Day
Contact Name: Leslie Maranciak

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Aluminium (filtered)	Ammonia (as N)	Arsenic	Arsenic (filtered)	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Cadmium (filtered)	Chromium	Chromium (filtered)	Conductivity (at 25 °C)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103 °C to 105 °C	Turbidity	Zinc	Zinc (filtered)	Eurofins Suite B4	Eurofins Suite B19A: Total N (TKN, NO _x), Total P		
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
External Laboratory																											X									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																															
1	MW01R	Sep 01, 2022		Water	M22-Se0002866	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X		
2	101R	Sep 01, 2022		Water	M22-Se0002867	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X		
3	MW101R	Sep 01, 2022		Water	M22-Se0002868	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X		
4	MW106R	Sep 01, 2022		Water	M22-Se0002869	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X		
5	MW108R	Sep 01, 2022		Water	M22-Se0002870	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X		
6	MW109	Sep 01, 2022		Water	M22-Se0002871	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X		
7	MW301R	Sep 01, 2022		Water	M22-Se0002872	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X		
8	MW02	Sep 01, 2022		Water	M22-Se0002873	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X		
9	MW307R	Sep 01, 2022		Water	M22-Se0002874	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X		
10	MW308R	Sep 01, 2022		Water	M22-Se0002875	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X		
11	MW302R	Sep 01, 2022		Water	M22-Se0002876	X	X		X	X		X		X	X		X		X		X		X		X	X	X	X	X	X	X	X	X	X		
12	FD01	Sep 01, 2022		Water	M22-Se0002877		X		X			X		X				X		X		X		X		X							X	X	X	
13	RB01	Sep 01, 2022		Water	M22-Se0002878	X			X			X		X		X		X		X		X		X		X					X		X	X	X	

ABN: 50 005 085 521

ABN: 91 05 0159 898

NZBN: 9429046024954

Melbourne
6 Monterey Road
Dandenong South
VIC 3175
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Geelong
19/8 Lewalan Street
Grovedale
VIC 3216
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Sydney
179 Magowar Road
Girraween
NSW 2145
Tel: +61 2 9900 8400
NATA# 1261 Site# 18217

Canberra
Unit 1,2 Dacre Street
Mitchell
ACT 2911
Tel: +61 2 6113 8091

Brisbane
1/21 Smallwood Place
Murarrie
QLD 4172
Tel: +61 7 3902 4600
NATA# 1261 Site# 20794

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Tel: +61 2 4968 8448
NATA# 1261 Site# 25079

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Auckland
35 O'Rorke Road
Penrose,
Auckland 1061
Tel: +64 9 526 45 51
IANZ# 1327

Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Company Name:	GHD Pty Ltd NEWCASTLE	Order No.:		Received:	Sep 1, 2022 1:58 PM
Address:	3/24 Honeysuckle Dve Newcastle NSW 2300	Report #:	919901	Due:	Sep 8, 2022
Project Name:	AURIZON HEXHAM WATER MONITORING	Phone:	02 4979 9999	Priority:	5 Day
Project ID:	12584780	Fax:	02 4979 9988	Contact Name:	Leslie Maranciak

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Aluminium (filtered)	Ammonia (as N)	Arsenic	Arsenic (filtered)	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Cadmium (filtered)	Chromium	Chromium (filtered)	Conductivity (at 25 °C)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103 °C to 105 °C	Turbidity	Zinc	Zinc (filtered)	Eurofins Suite B4	Eurofins Suite B19A: Total N (TKN, NOx), Total P	
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14	SW9	Sep 01, 2022		Water	M22-Se0002879	X		X	X		X	X		X		X	X		X		X		X		X	X	X	X	X	X	X	X	X	X	X
15	BASIN 1	Sep 01, 2022		Water	M22-Se0002880	X		X	X		X	X		X		X	X		X		X		X		X	X	X	X	X	X	X	X	X	X	X
16	BASIN 2	Sep 01, 2022		Water	M22-Se0002881	X		X	X		X	X		X		X	X		X		X		X		X	X	X	X	X	X	X	X	X	X	X
17	BASIN 3	Sep 01, 2022		Water	M22-Se0002882	X		X	X		X	X		X		X	X		X		X		X		X	X	X	X	X	X	X	X	X	X	X
Test Counts						5	12	15	5	12	15	5	12	5	12	15	5	12	5	12	5	12	5	12	5	12	15	15	15	15	5	12	17	17	

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	mg/L	< 5			5	Pass	
Conductivity (at 25 °C)	uS/cm	< 10			10	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Phosphate total (as P)	mg/L	< 0.01			0.01	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	mg/L	< 5			5	Pass	
Turbidity	NTU	< 1			1	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/L	< 0.05			0.05	Pass	
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Arsenic	mg/L	< 0.001			0.001	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Chromium (filtered)	mg/L	0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Iron	mg/L	< 0.05			0.05	Pass	
Iron (filtered)	mg/L	< 0.05			0.05	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	103			70-130	Pass	
TRH C10-C14	%	110			70-130	Pass	
Naphthalene	%	102			70-130	Pass	
TRH C6-C10	%	106			70-130	Pass	
TRH >C10-C16	%	107			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	109			70-130	Pass	
Toluene	%	110			70-130	Pass	
Ethylbenzene	%	108			70-130	Pass	
m&p-Xylenes	%	105			70-130	Pass	
Xylenes - Total*	%	106			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthylene	%	102			70-130	Pass	
Anthracene	%	95			70-130	Pass	
Benz(a)anthracene	%	105			70-130	Pass	
Benzo(a)pyrene	%	99			70-130	Pass	
Benzo(b&i)fluoranthene	%	92			70-130	Pass	
Benzo(g,h,i)perylene	%	87			70-130	Pass	
Benzo(k)fluoranthene	%	92			70-130	Pass	
Chrysene	%	103			70-130	Pass	
Dibenz(a,h)anthracene	%	83			70-130	Pass	
Fluoranthene	%	88			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	87			70-130	Pass	
Naphthalene	%	73			70-130	Pass	
Phenanthrene	%	97			70-130	Pass	
Pyrene	%	91			70-130	Pass	
LCS - % Recovery							
Ammonia (as N)	%	100			70-130	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	%	104			85-115	Pass	
Conductivity (at 25 °C)	%	93			70-130	Pass	
Nitrate & Nitrite (as N)	%	90			70-130	Pass	
Phosphate total (as P)	%	106			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	111			70-130	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	%	100			70-130	Pass	

Test				Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery									
Heavy Metals									
Aluminium				%	103		80-120	Pass	
Aluminium (filtered)				%	103		80-120	Pass	
Arsenic				%	95		80-120	Pass	
Arsenic (filtered)				%	98		80-120	Pass	
Cadmium				%	98		80-120	Pass	
Cadmium (filtered)				%	95		80-120	Pass	
Chromium				%	93		80-120	Pass	
Chromium (filtered)				%	97		80-120	Pass	
Copper				%	89		80-120	Pass	
Copper (filtered)				%	95		80-120	Pass	
Iron				%	95		80-120	Pass	
Iron (filtered)				%	99		80-120	Pass	
Lead				%	90		80-120	Pass	
Lead (filtered)				%	97		80-120	Pass	
Mercury				%	88		80-120	Pass	
Mercury (filtered)				%	91		80-120	Pass	
Nickel				%	93		80-120	Pass	
Nickel (filtered)				%	96		80-120	Pass	
Zinc				%	95		80-120	Pass	
Zinc (filtered)				%	95		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons					Result 1				
TRH C6-C9	M22-Se0011661	NCP	%	111			70-130	Pass	
TRH C10-C14	M22-Au0055088	NCP	%	96			70-130	Pass	
Naphthalene	M22-Se0011661	NCP	%	73			70-130	Pass	
TRH C6-C10	M22-Se0011661	NCP	%	111			70-130	Pass	
TRH >C10-C16	M22-Au0055088	NCP	%	102			70-130	Pass	
Spike - % Recovery									
BTEX					Result 1				
Benzene	M22-Se0011661	NCP	%	96			70-130	Pass	
Toluene	M22-Se0011661	NCP	%	94			70-130	Pass	
Ethylbenzene	M22-Se0011661	NCP	%	77			70-130	Pass	
m&p-Xylenes	M22-Se0011661	NCP	%	74			70-130	Pass	
o-Xylene	M22-Se0011661	NCP	%	72			70-130	Pass	
Xylenes - Total*	M22-Se0011661	NCP	%	73			70-130	Pass	
Spike - % Recovery									
					Result 1				
Ammonia (as N)	W22-Se0002709	NCP	%	103			70-130	Pass	
Nitrate & Nitrite (as N)	W22-Se0002709	NCP	%	90			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	M22-Se0002018	NCP	%	119			70-130	Pass	
Spike - % Recovery									
Heavy Metals					Result 1				
Aluminium (filtered)	M22-Se0002866	CP	%	93			75-125	Pass	
Arsenic (filtered)	M22-Se0002866	CP	%	97			75-125	Pass	
Cadmium (filtered)	M22-Se0002866	CP	%	88			75-125	Pass	
Chromium (filtered)	M22-Se0002866	CP	%	90			75-125	Pass	
Copper (filtered)	M22-Se0002866	CP	%	89			75-125	Pass	
Iron (filtered)	M22-Se0005820	NCP	%	81			75-125	Pass	
Lead (filtered)	M22-Se0002866	CP	%	90			75-125	Pass	
Mercury (filtered)	M22-Se0002866	CP	%	79			75-125	Pass	
Nickel (filtered)	M22-Se0002866	CP	%	107			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Zinc (filtered)	M22-Se0002866	CP	%	110			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium (filtered)	M22-Se0002876	CP	%	93			75-125	Pass	
Arsenic (filtered)	M22-Se0002876	CP	%	95			75-125	Pass	
Cadmium (filtered)	M22-Se0002876	CP	%	92			75-125	Pass	
Chromium (filtered)	M22-Se0002876	CP	%	92			75-125	Pass	
Copper (filtered)	M22-Se0002876	CP	%	92			75-125	Pass	
Lead (filtered)	M22-Se0002876	CP	%	92			75-125	Pass	
Mercury (filtered)	M22-Se0002876	CP	%	85			75-125	Pass	
Nickel (filtered)	M22-Se0002876	CP	%	93			75-125	Pass	
Zinc (filtered)	M22-Se0002876	CP	%	84			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	M22-Se0002879	CP	%	106			75-125	Pass	
Arsenic	M22-Se0002879	CP	%	102			75-125	Pass	
Cadmium	M22-Se0002879	CP	%	95			75-125	Pass	
Chromium	M22-Se0002879	CP	%	97			75-125	Pass	
Copper	M22-Se0002879	CP	%	92			75-125	Pass	
Iron	M22-Se0002879	CP	%	88			75-125	Pass	
Lead	M22-Se0002879	CP	%	90			75-125	Pass	
Mercury	M22-Se0002879	CP	%	100			75-125	Pass	
Nickel	M22-Se0002879	CP	%	94			75-125	Pass	
Zinc	M22-Se0002879	CP	%	99			75-125	Pass	
Spike - % Recovery									
				Result 1					
Total Suspended Solids Dried at 103 °C to 105 °C	M22-Se0002880	CP	%	99			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	M22-Se0011663	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M22-Se0005848	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M22-Se0005848	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M22-Se0005848	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Naphthalene	M22-Se0011663	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M22-Se0011663	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	M22-Se0005848	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M22-Se0005848	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M22-Se0005848	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M22-Se0011663	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M22-Se0011663	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M22-Se0011663	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M22-Se0011663	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M22-Se0011663	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	M22-Se0011663	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	W22-Se0002481	NCP	mg/L	0.16	0.18	8.8	30%	Pass	
Conductivity (at 25 °C)	M22-Se0000645	NCP	uS/cm	780	790	<1	30%	Pass	
Nitrate & Nitrite (as N)	W22-Se0002481	NCP	mg/L	3.8	3.8	<1	30%	Pass	
pH (at 25 °C)	M22-Se0000645	NCP	pH Units	8.2	8.2	pass	30%	Pass	

Duplicate								
				Result 1	Result 2	RPD		
Total Kjeldahl Nitrogen (as N)	M22-Se0002024	NCP	mg/L	160	140	12	30%	Pass
Total Suspended Solids Dried at 103 °C to 105 °C	W22-Se0002617	NCP	mg/L	29	27	7.1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium (filtered)	M22-Se0002866	CP	mg/L	0.16	0.15	5.0	30%	Pass
Arsenic (filtered)	M22-Se0002866	CP	mg/L	0.001	0.001	6.0	30%	Pass
Cadmium (filtered)	M22-Se0002866	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium (filtered)	M22-Se0002866	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper (filtered)	M22-Se0002866	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Lead (filtered)	M22-Se0002866	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury (filtered)	M22-Se0002866	CP	mg/L	< 0.0001	0.0001	64	30%	Fail Q15
Nickel (filtered)	M22-Se0002866	CP	mg/L	0.044	0.043	1.5	30%	Pass
Zinc (filtered)	M22-Se0002866	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Turbidity	M22-Se0002867	CP	NTU	28	21	28	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Acenaphthylene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Anthracene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benz(a)anthracene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(a)pyrene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(b&j)fluoranthene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(g,h,i)perylene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(k)fluoranthene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Chrysene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Dibenz(a,h)anthracene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluoranthene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluorene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Naphthalene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Phenanthrene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Pyrene	M22-Se0002924	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Turbidity	M22-Se0002872	CP	NTU	61	58	3.9	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Phosphate total (as P)	M22-Se0012601	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Biochemical Oxygen Demand (BOD-5 Day)	M22-Se0002876	CP	mg/L	< 5	< 5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium (filtered)	M22-Se0002876	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Arsenic (filtered)	M22-Se0002876	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Cadmium (filtered)	M22-Se0002876	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium (filtered)	M22-Se0002876	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper (filtered)	M22-Se0002876	CP	mg/L	0.001	0.001	1.0	30%	Pass
Iron (filtered)	M22-Se0002876	CP	mg/L	16	16	<1	30%	Pass
Lead (filtered)	M22-Se0002876	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury (filtered)	M22-Se0002876	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Nickel (filtered)	M22-Se0002876	CP	mg/L	0.005	0.005	<1	30%	Pass
Zinc (filtered)	M22-Se0002876	CP	mg/L	0.096	0.10	3.4	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Turbidity	M22-Se0002879	CP	NTU	1.8	1.8	2.8	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium	M22-Se0002879	CP	mg/L	0.10	0.11	15	30%	Pass
Arsenic	M22-Se0002879	CP	mg/L	0.001	< 0.001	14	30%	Pass
Cadmium	M22-Se0002879	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium	M22-Se0002879	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper	M22-Se0002879	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Iron	M22-Se0002879	CP	mg/L	0.72	0.71	1.5	30%	Pass
Lead	M22-Se0002879	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury	M22-Se0002879	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	M22-Se0002879	CP	mg/L	0.001	0.001	2.8	30%	Pass
Zinc	M22-Se0002879	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass

Comments

Thermotolerant coliforms analysed by; Eurofins Food testing; accreditation number 20293; report reference AR-22-NV-011576-01

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Andrew Black	Analytical Services Manager
Caitlin Breeze	Senior Analyst-Inorganic
Edward Lee	Senior Analyst-Organic
Emily Rosenberg	Senior Analyst-Metal
Harry Bacalis	Senior Analyst-Volatile
Joseph Edouard	Senior Analyst-Organic
Mary Makarios	Senior Analyst-Inorganic
Scott Beddoes	Senior Analyst-Inorganic
Scott Beddoes	Senior Analyst-Metal
Vivian Wang	Senior Analyst-Volatile



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne 6 Monterey Road Dandenong South VIC 3175 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Geelong 19/8 Lewalan Street Grovedale VIC 3216 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Sydney 179 Magowar Road Girraween NSW 2145 Tel: +61 2 9900 8400 NATA# 1261 Site# 18217
---	---	--

Canberra Unit 1,2 Dacre Street Mitchell ACT 2911 Tel: +61 2 6113 8091	Brisbane 1/21 Smallwood Place Murarie QLD 4172 Tel: +61 7 3902 4600 NATA# 1261 Site# 20794	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Tel: +61 2 4968 8448 NATA# 1261 Site# 25079
--	--	---

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland 35 O'Rorke Road Penrose, Auckland 1061 Tel: +64 9 526 45 51 IANZ# 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Tel: 0800 856 450 IANZ# 1290
---	---

Sample Receipt Advice

Company name: GHD Pty Ltd NEWCASTLE
Contact name: Leslie Maranciak
Project name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780
Turnaround time: 5 Day
Date/Time received: Sep 1, 2022 1:58 PM
Eurofins reference: 919901

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 17.3 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✓ Split sample sent to requested external lab.
- ✓ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Leslie Maranciak - leslie.maranciak@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NEWCASTLE email address.



mgt

Sydney
 Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
 Phone: +612 9900 8400
 Email: enviro.syd@mglabmark.com.au

Brisbane
 Unit 1-21 Smallwood Place, Murrarie
 Phone: +617 3902 4600
 Email: enviro.bris@mglabmark.com.au

Melbourne
 2 Kingston Town Close, Oakleigh, VIC 3166
 Phone: +613 8564 5000 Fax: +613 8564 5090
 Email: enquiries.melb@mglabmark.com.au

1/2

1

CHAIN OF CUSTODY RECORD

Page 2 of 2

Company Name : GHD	Contact Name : Lachlan Parkinson	Purchase Order : 12584780	DOC Number :
Office Address : L3, 24 Honeysuckle Drive Newcastle 2300	Project Manager : Leslie Maranciak	PROJECT Number : 12584780	Eurofins | mgt quote ID : 180501GHD
	Email for results : Leslie.Maranciak@ghd.com Lachlan.Parkinson@ghd.com	PROJECT Name : Aurizon Hexham Water Monitoring	Data output format: ESDAT

Special Directions & Comments : Please ensure fecal coliforms are reported in CFU/100ml	Analytes										Some common holding times (with correct preservation). For further information contact the lab			
	B4 (BTEXN / TRH / PAH) Dissolved Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn) pH, Conductivity, Turbidity, Suspended Solids Ammonia Suite B19A (Nutrients, Total N (TKN), NO3), Total P Thermotolerant Coliforms (CFU/100ml) BOD 5 Day	Send to ALS - same analysis as FD01 at ALS please										Waters		Soils
BTEX, MAH, VOC		14 days	BTEX, MAH, VOC	14 days										
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days											
Heavy Metals	6 months	Heavy Metals	6 months											
Mercury, CrVI	28 days	Mercury, CrVI	28 days											
Microbiological testing	24 hours	Microbiological testing	72 hours											
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days											
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours											
Ferrous iron	7 days	ASLP, TCLP	7 days											

Eurofins | mgt DI water batch number:	Sample ID	Date	Matrix	B4 (BTEXN / TRH / PAH)	Dissolved Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	Suite B19A (Nutrients, Total N (TKN), NO3), Total P	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day	Send to ALS - same analysis as FD01 at ALS please	Containers:							Sample comments:	
												1LP	250P	125P	1LA	40mL vial	125mL A	Jar		
	1	1/4/22	W	X	X	X	X	X	X	X										
	2		W	X	X	X	X	X	X	X										
	3		W	X	X	X	X	X	X	X										
	4		W	X	X	X	X	X	X	X										
	5		W	X	X	X	X	X	X	X										
	6		W	X	X	X	X	X	X	X										
	7		W	X	X	X	X	X	X	X										
	8		W	X	X	X	X	X	X	X										
	9		W	X	X	X	X	X	X	X										
	10		W	X	X	X	X	X	X	X										
	11		W	X	X	X	X	X	X	X										
	12		W	X	X			X												Send to ALS Same Analysis as FD01
	13		W								X									
	14		W	X	X			X												
	15																			
	16																			
	17																			

Relinquished By: L Parkinson	Received By: Daidyn Stojman	Turn around time	Method Of Shipment	Temperature on arrival: 17.3
Date & Time: 1/4/22	Date & Time: 1/9/22 1:58 PM	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>	<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal	Report number: 919901
Signature: [Signature]	Signature: [Signature]	5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:	Courier Consignment # :	

Jake



mgt

Sydney
 Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
 Phone: +612 9900 8400
 Email: enviro.syd@mgtlabmark.com.au

Brisbane
 Unit 1-21 Smallwood Place, Murrarie
 Phone: +617 3902 4600
 Email: enviro.bris@mgtlabmark.com.au

Melbourne
 2 Kingston Town Close, Oakleigh, VIC 3166
 Phone: +613 8564 5000 Fax: +613 8564 5090
 Email: enquires.melb@mgtlabmark.com.au

2/2

①

CHAIN OF CUSTODY RECORD

Page 1 of 2

Company Name: GHD	Contact Name: Lachlan Parkinson	Purchase Order: 12584780	COC Number:
Office Address: L3, 24 Honey Suckle Drive Newcastle 2300	Project Manager: Leslie Maranciak	PROJECT Number: 12584780	Eurofins | mgt quote ID: 180501GHD
	Email for results: Leslie.Maranciak@ghd.com Lachlan.Parkinson@ghd.com	PROJECT Name: Aurizon Hexham Water Monitoring	Data output format: ESDAT

Special Directions & Comments:
Please ensure fecal coliforms are reported in CFU/100ml

Analytes	Some common holding times (with correct preservation). For further information contact the lab			
	Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days	
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days	
Heavy Metals	6 months	Heavy Metals	6 months	
Mercury, CrVI	28 days	Mercury, CrVI	28 days	
Microbiological testing	24 hours	Microbiological testing	72 hours	
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days	
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours	
Ferrous iron	7 days	ASLP, TCLP	7 days	

Sample ID	Date	Matrix	B4 (BTEXN / TRH / PAH)	Total Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Aeromonas	Sulfate 819A (Nutrients, Total N (TKN, NOX), Total P)	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day	Containers:							Sample comments:	
										1LP	250P	125P	1LA	40mL vial	125mL A	Jar		
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10	SW9	1/4/22	W	X	X	X	X	X	X	X	X							
11																		
12																		
13	Basin 1	1/9/22	W	X	X	X	X	X	X	X	X							
14	Basin 2		W	X	X	X	X	X	X	X	X							
15	Basin 3		W	X	X	X	X	X	X	X	X							
16																		
17																		
18																		
19																		
20																		

Relinquished By: L Parkinson	Laboratory Staff	Turn around time	Method Of Shipment	Temperature on arrival: 17.3
Date & Time: 1/9/22	Received By: Jordan Date & Time: 1/9/22 1:58pm	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>	<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal	Report number:
Signature: [Signature]	Signature: [Signature]	5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other: _____	Courier Consignment #:	

CERTIFICATE OF ANALYSIS

Work Order : EM2217189 Client : GHD PTY LTD Contact : Leslie Maranciak Address : Level 3, GHD Tower, 24 Honeysuckle Drive Newcastle 2300 Telephone : ---- Project : 12584780 Order number : 12584780 C-O-C number : ---- Sampler : ---- Site : Quote number : EN/005 No. of samples received : 1 No. of samples analysed : 1	Page : 1 of 6 Laboratory : Environmental Division Melbourne Contact : Peter Ravlic Address : 4 Westall Rd Springvale VIC Australia 3171 Telephone : +6138549 9645 Date Samples Received : 05-Sep-2022 09:45 Date Analysis Commenced : 06-Sep-2022 Issue Date : 07-Sep-2022 15:02
--	---



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FD02	----	----	----	----
Sampling date / time				01-Sep-2022 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	EM2217189-001	-----	-----	-----	-----	
Result				Result	----	----	----	----	
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	<0.01	----	----	----	----	
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----	
Cadmium	7440-43-9	0.0001	mg/L	0.0001	----	----	----	----	
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----	
Copper	7440-50-8	0.001	mg/L	0.001	----	----	----	----	
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----	
Nickel	7440-02-0	0.001	mg/L	0.005	----	----	----	----	
Zinc	7440-66-6	0.005	mg/L	0.092	----	----	----	----	
Iron	7439-89-6	0.05	mg/L	15.7	----	----	----	----	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	0.98	----	----	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	3.1	----	----	----	----	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	4.1	----	----	----	----	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	1.54	----	----	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----	
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----	
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----	
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----	
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----	
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FD02	----	----	----	----
Sampling date / time				01-Sep-2022 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	EM2217189-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----	
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----	
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----	
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----	
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----	
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----	
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----	
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----	
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	----	----	----	----	
Toluene	108-88-3	2	µg/L	<2	----	----	----	----	
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----	
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----	
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----	
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----	
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%	16.0	----	----	----	----	
2-Chlorophenol-D4	93951-73-6	1.0	%	78.1	----	----	----	----	
2,4,6-Tribromophenol	118-79-6	1.0	%	95.8	----	----	----	----	
EP075(SIM)T: PAH Surrogates									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FD02	----	----	----	----
Sampling date / time				01-Sep-2022 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	EM2217189-001	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
EP075(SIM)T: PAH Surrogates - Continued									
2-Fluorobiphenyl	321-60-8	1.0	%	78.2	----	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%	81.7	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%	82.3	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%	104	----	----	----	----	----
Toluene-D8	2037-26-5	2	%	101	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	123	----	----	----	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	51
2-Chlorophenol-D4	93951-73-6	30	114
2,4,6-Tribromophenol	118-79-6	26	133
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	35	127
Anthracene-d10	1719-06-8	44	122
4-Terphenyl-d14	1718-51-0	44	124
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

QUALITY CONTROL REPORT

Work Order	: EM2217189	Page	: 1 of 6
Client	: GHD PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: Leslie Maranciak	Contact	: Peter Ravlic
Address	: Level 3, GHD Tower, 24 Honeysuckle Drive Newcastle 2300	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12584780	Date Samples Received	: 05-Sep-2022
Order number	: 12584780	Date Analysis Commenced	: 06-Sep-2022
C-O-C number	: ----	Issue Date	: 07-Sep-2022
Sampler	: ----		
Site	:		
Quote number	: EN/005		
No. of samples received	: 1		
No. of samples analysed	: 1		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4562217)									
EM2217067-016	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.078	0.077	0.0	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.015	0.016	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.01	<0.01	0.0	No Limit
EM2217186-007	Anonymous	EG020A-F: Iron	7439-89-6	0.05	mg/L	1.60	1.60	0.0	0% - 20%
		EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0034	0.0035	5.1	0% - 20%
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.104	0.102	1.2	0% - 20%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.008	0.008	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.855	0.850	0.7	0% - 20%
EM2217189-001	FD02	EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.02	0.02	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.06	0.07	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 4562215)									
EM2217189-001	FD02	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2216692-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4562030)									
EM2217189-001	FD02	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.98	0.97	1.1	0% - 20%

Page : 3 of 6
 Work Order : EM2217189
 Client : GHD PTY LTD
 Project : 12584780



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4561861)										
EM2217177-005	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.3	1.3	0.0	0% - 50%	
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4561862)										
EM2217067-008	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.91	0.88	3.6	0% - 20%	
EM2217177-005	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.42	0.39	9.4	0% - 20%	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4561533)										
EM2217152-030	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4561533)										
EM2217152-030	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
EP080: BTEXN (QC Lot: 4561533)										
EM2217152-030	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit		



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 4562217)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	97.9	90.4	111
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.7	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.0	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.3	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.8	84.6	108
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.7	84.3	110
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	100	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	94.6	91.8	112
EG035F: Dissolved Mercury by FIMS (QCLot: 4562215)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	110	71.6	116
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4562030)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	101	90.0	117
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4561861)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	101	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4561862)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	95.6	71.9	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4561565)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	93.0	42.8	114
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	96.4	48.6	119
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	104	47.0	117
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	105	49.5	119
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	101	49.4	121
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	102	48.4	122
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	104	50.3	124
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	108	50.0	126
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	109	49.4	127
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	106	48.7	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	110	54.5	134
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	112	56.1	134
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	110	55.6	135
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	108	54.4	126
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	108	54.5	126



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4561565) - continued								
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	109	54.4	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4561533)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	120	66.2	134
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4561566)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4000 µg/L	84.0	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	16900 µg/L	87.4	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8090 µg/L	87.2	50.4	127
EP071: C10 - C36 Fraction (sum)	----	50	µg/L	<50	28990 µg/L	87.0	51.5	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4561533)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	119	66.2	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4561566)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5830 µg/L	91.0	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	21700 µg/L	90.8	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1560 µg/L	78.6	47.2	130
EP071: >C10 - C40 Fraction (sum)	----	100	µg/L	<100	29090 µg/L	90.2	51.2	127
EP080: BTEXN (QCLot: 4561533)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	110	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	116	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	117	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	124	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	126	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	118	68.3	131

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%)	Acceptable Limits (%)	
				MS	Low	High	
EG020F: Dissolved Metals by ICP-MS (QCLot: 4562217)							
EM2217067-016	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	94.9	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	86.2	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	83.2	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	88.1	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	90.1	75.0	133
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	90.7	73.0	131

Page : 6 of 6
 Work Order : EM2217189
 Client : GHD PTY LTD
 Project : 12584780



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 4562217) - continued							
EM2217067-016	Anonymous	EG020A-F: Zinc	7440-66-6	0.2 mg/L	86.9	75.0	131
EG035F: Dissolved Mercury by FIMS (QCLot: 4562215)							
EM2216874-004	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	86.1	70.0	120
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4561861)							
EM2217072-065	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	94.3	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4561862)							
EM2217072-065	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	89.5	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4561533)							
EM2217189-001	FD02	EP080: C6 - C9 Fraction	----	280 µg/L	78.9	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4561533)							
EM2217189-001	FD02	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	74.4	34.0	122
EP080: BTEXN (QCLot: 4561533)							
EM2217189-001	FD02	EP080: Benzene	71-43-2	20 µg/L	88.8	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	92.8	60.4	132

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM2217189	Page	: 1 of 6
Client	: GHD PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: Leslie Maranciak	Telephone	: +6138549 9645
Project	: 12584780	Date Samples Received	: 05-Sep-2022
Site	:	Issue Date	: 07-Sep-2022
Sampler	: ----	No. of samples received	: 1
Order number	: 12584780	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	1	15	6.67	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	9	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Nitrite and Nitrate as N (NOx) by Discrete Analyser	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	9	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for **VOC in soils** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) FD02	01-Sep-2022	----	----	----	06-Sep-2022	28-Feb-2023	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) FD02	01-Sep-2022	----	----	----	06-Sep-2022	29-Sep-2022	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) FD02	01-Sep-2022	----	----	----	06-Sep-2022	29-Sep-2022	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) FD02	01-Sep-2022	06-Sep-2022	29-Sep-2022	✓	07-Sep-2022	29-Sep-2022	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) FD02	01-Sep-2022	06-Sep-2022	29-Sep-2022	✓	07-Sep-2022	29-Sep-2022	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) FD02	01-Sep-2022	06-Sep-2022	08-Sep-2022	✓	06-Sep-2022	16-Oct-2022	✓



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method <i>Container / Client Sample ID(s)</i>	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) FD02	01-Sep-2022	06-Sep-2022	08-Sep-2022	✓	06-Sep-2022	16-Oct-2022	✓
Clear glass VOC vial - HCl (EP080) FD02	01-Sep-2022	06-Sep-2022	15-Sep-2022	✓	06-Sep-2022	15-Sep-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) FD02	01-Sep-2022	06-Sep-2022	08-Sep-2022	✓	06-Sep-2022	16-Oct-2022	✓
Clear glass VOC vial - HCl (EP080) FD02	01-Sep-2022	06-Sep-2022	15-Sep-2022	✓	06-Sep-2022	15-Sep-2022	✓
EP080: BTEXN							
Clear glass VOC vial - HCl (EP080) FD02	01-Sep-2022	06-Sep-2022	15-Sep-2022	✓	06-Sep-2022	15-Sep-2022	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	15	13.33	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	19	10.53	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	100.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	15	6.67	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	16	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	9	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	7	14.29	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	0	1	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	9	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)

Page : 6 of 6
Work Order : EM2217189
Client : GHD PTY LTD
Project : 12584780



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : EM2217189

Client	: GHD PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: Leslie Maranciak	Contact	: Peter Ravlic
Address	: Level 3, GHD Tower, 24 Honeysuckle Drive Newcastle 2300	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: leslie.maranciak@ghd.com	E-mail	: peter.ravlic@alsglobal.com
Telephone	: ----	Telephone	: +6138549 9645
Facsimile	: ----	Facsimile	: +61-3-8549 9626
Project	: 12584780	Page	: 1 of 2
Order number	: 12584780	Quote number	: EB2020GHDSER0038 (EN/005)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	:		

Dates

Date Samples Received	: 05-Sep-2022 09:45	Issue Date	: 05-Sep-2022
Client Requested Due Date	: 12-Sep-2022	Scheduled Reporting Date	: 12-Sep-2022

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 7.4°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Sample(s) received in non-ALS container(s).**
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EG035F Dissolved Mercury	WATER - NT-11 Total Nitrogen and Total Phosphorus	WATER - W-07 TRHBTEXN/PAH
EM2217189-001	01-Sep-2022 00:00	FD02	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)

Email accountspayableAU@ghd.com

LACHLAN PARKINSON

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - ESDAT (ESDAT)
- Electronic SRN for ESdat (ESRN_ESDAT)

Email Lachlan.Parkinson@ghd.com
 Email Lachlan.Parkinson@ghd.com
 Email Lachlan.Parkinson@ghd.com
 Email Lachlan.Parkinson@ghd.com
 Email Lachlan.Parkinson@ghd.com
 Email Lachlan.Parkinson@ghd.com
 Email Lachlan.Parkinson@ghd.com

Leslie Maranciak

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ESDAT (ESDAT)
- Electronic SRN for ESdat (ESRN_ESDAT)

Email leslie.maranciak@ghd.com
 Email leslie.maranciak@ghd.com
 Email leslie.maranciak@ghd.com
 Email leslie.maranciak@ghd.com
 Email leslie.maranciak@ghd.com
 Email leslie.maranciak@ghd.com
 Email leslie.maranciak@ghd.com
 Email leslie.maranciak@ghd.com

RESULTS CONT LAND TEAM

- A4 - AU Tax Invoice (INV)
- EDI Format - ESDAT (ESDAT)

Email ntl.car@ghd.com
 Email ntl.car@ghd.com



mgt

Sydney
 Unit F3 - 6 Building F, 18 Mack Road, Lane Cove
 Phone: +612 9600 8000
 Email: enviro.syd@mgfaborne.com.au

Brisbane
 Unit T-21 Smallwood Place, Morningside
 Phone: +617 3902 4800
 Email: enviro.bris@mgfaborne.com.au

Melbourne
 2 Kingston Town Close, Dingley, VIC 3188
 Phone: +613 8564 5000 Fax: +613 8564 5280
 Email: enviro.mel@mgfaborne.com.au

CHAIN OF CUSTODY RECORD

Page 2 of 2

CLIENT DETAILS		Purchase Order : 12584780		COC Number :	
Company Name : GHD	Contact Name : Lachlan Parkinson	PROJECT Number : 12584780		Eurofins | mgt quote ID : 185501GHD	
Office Address : 3, 24 honeysuckle Drive	Project Manager : Leslie Maronciak	PROJECT Name : Aunzon Hesham Water Monitoring		Data output format : ESDAT	
Newcastle 2300	Email for results : Leslie.Maronciak@ghd.com Lachlan.Parkinson@ghd.com	COPY			

Special Directions & Comments :
Please ensure fecal coliforms are reported in CFU/100ml

Sample ID	Date	Matrix	Analytes											Send to ALS - same analysis as F001 at ALS please	
			B4 (BTEXN / TRH / PAH)	Dissolved Metals (Mn, As, Cd, Cr, Cu, Fe, Pb, Ph, Pp, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	Sum BSM Parameters (Total NITROGEN, PO4, Total P)	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day						
1	1/9/22	W	X	X	X	X	X	X	X	X	X	X	X	X	
2		W	X	X	X	X	X	X	X	X	X	X	X	X	
3		W	X	X	X	X	X	X	X	X	X	X	X	X	
4		W	X	X	X	X	X	X	X	X	X	X	X	X	
5		W	X	X	X	X	X	X	X	X	X	X	X	X	
6		W	X	X	X	X	X	X	X	X	X	X	X	X	
7		W	X	X	X	X	X	X	X	X	X	X	X	X	
8		W	X	X	X	X	X	X	X	X	X	X	X	X	
9		W	X	X	X	X	X	X	X	X	X	X	X	X	
10		W	X	X	X	X	X	X	X	X	X	X	X	X	
11		W	X	X	X	X	X	X	X	X	X	X	X	X	
12		W	X	X											
13		W													
14		W	X	X											

Some common holding times (with correct preservation) for further information contact the lab

Waters	Soils
BTEX, MAH, VOC	BTEX, MAH, VOC
TRH, PAH, Phenols, Pesticides	TRH, PAH, Phenols, Pesticides
Heavy Metals	Heavy Metals
Mercury, CrVI	Mercury, CrVI
Microbiological testing	Microbiological testing
BOD, Nitrate, Nitrite, Total N	Ammonia
Solids - TSS, TDS, etc	SPOCAS, pH Field and FOX, Cr6
Permeametry	ASLP, TCLP

Environmental Division
 Melbourne
 Work Order Reference
EM2217189



Telephone : + 61-3-8549 9601

YLP	25SP	12SP	TLA	ADRI, W8	135ML A	JAF	Sample comments:

Rating by EG
 8/10k
 5/9/22

Responsible By: **L Parkinson**

Date & Time: **1/9/22**

Signature: *[Signature]*

Received By: **Jaidyn Stojanovic**

Date & Time: **1/9/22 1:58 PM**

Signature: *[Signature]*

Turn around time:
 1 DAY 2 DAY 3 DAY 4 DAY 10 DAY Other

Method Of Shipment:
 Courier
 Hand Delivered
 Postal

Courier Consignment #: **9425**

Temperature on arrival: **17.3**

Report number: **ALS**

ALS Logo

Received: *[Signature]*

2/2

1

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name: GHD	Contact Name: Lachlan Parkinson	Purchase Order #: 12584780	COG Number:
Office Address: L3, 24 Honeysuckle Drive	Project Manager: Leslie Maranciak	PROJECT Number: 12584780	Eurofins / mgt quote ID: 180501GHD
Newcastle 2300	Email for results: Leslie.Maranciak@ghd.com Lachlan.Parkinson@ghd.com	PROJECT Name: Aurizon Hexham Water Monitoring	Data output format: ESQAT

Special Directions & Comments:

Please ensure fecal coliforms are reported in CFU/100ml

Analytes

BA (BTEXH / TRH / PAH) Total Metals (V, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn), pH, Conductivity, Turbidity, Suspended Solids Ammonia Solids (TSS, Nitrogen, Total N (TKN), Nitrite, Total P Thermotolerant Coliforms (CFU/100ml) BOD 5 Day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Some elements holding times (with correct preservation):
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	24 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Ammonia	28 days
Solids - TSS, TDS etc	7 days	SPDCAS, pH Field and PCO, CYS	24 hours
Ferrous Iron	7 days	ASAP, TSSP	7 days

Eurofins / mgt ID water batch number:

Sample ID	Date	Matrix	BA	BTEXH	TRH	PAH	Total Metals	pH	Conductivity	Turbidity	Suspended Solids	Ammonia	Solids (TSS)	Nitrogen	Total N (TKN)	Nitrite	Total P	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day
1		SW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2		SW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3		SW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4		SW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5		SW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6		SW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7		SW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8		SW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9		SW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10	1/9/22	SW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11		SW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12		SW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13	Basin 1	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14	Basin 2	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	Basin 2	W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16																			
17																			
18																			
19																			
20																			

Released By: <i>L Parkinson</i>	Received By: <i>Jason</i>	Turn around time	Method Of Shipment	Temperature on arrival: 17.3
Date & Time: 1/9/22	Date & Time: 1/9/22 1:58pm	<input type="checkbox"/> 1 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/> 5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> 15 DAY <input type="checkbox"/> 20 DAY	<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal Courier Confirmation #	Report number:
Signature: <i>LP</i>	Signature: <i>J...</i>			

Marr

ANALYTICAL REPORT

REPORT CODE

AR-22-NV-013464-01

REPORT DATE

13/10/2022

Eurofins Environment Testing Australia Pty Ltd

For the attention of

Analytical Reports

6 Monterey Road

Dandenong South

3175 Melbourne

AUSTRALIA

Phone

 Email EnviroReportsau@eurofins.com

Contact for your orders:

Ruvini Herath

Order code:

EUAUTWU-00023487

Submission Reference:

 Merged from order
cau001-order-930744-221012.xml

Purchase Order Number:

930744

SAMPLE CODE
726-2022-00037482
Client Reference:

22-Oc0019895

Sample described as:

SW1

Reception Date:

12/10/2022

Analysis Starting Date:

12/10/2022

Sampled Date & Time:

11/10/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

13/10/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 12/10/2022 10:00

Thermotolerant coliforms

1 cfu/ml

1

SAMPLE CODE
726-2022-00037483
Client Reference:

22-Oc0019896

Sample described as:

SW2

Reception Date:

12/10/2022

Analysis Starting Date:

12/10/2022

Sampled Date & Time:

11/10/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

13/10/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 12/10/2022 10:00

Thermotolerant coliforms

4 cfu/ml

1

SAMPLE CODE
726-2022-00037484
Client Reference:

22-Oc0019897

Sample described as:

SW3

Reception Date:

12/10/2022

Analysis Starting Date:

12/10/2022

Sampled Date & Time:

11/10/2022 12:00:00

Reception temperature:

5.3 °C

Analysis Ending Date:

13/10/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 12/10/2022 10:00

Thermotolerant coliforms

11 cfu/ml

1

Eurofins Food Testing Australia Pty Ltd

 6 Monterey Road
Dandenong South
Melbourne
VIC 3175
AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/food-testing>

 Accredited for compliance with ISO/IEC
17025 - Testing

 NATA is a signatory to the ILAC Mutual
Recognition Arrangement for the mutual
recognition of the equivalence of testing,
medical testing, calibration, inspection,
proficiency testing scheme providers and
reference materials producers reports and
certificates.

Accreditation Number 20293



SAMPLE CODE 726-2022-00037485

Client Reference: 22-Oc0019898
Sample described as: SW4
Reception Date: 12/10/2022
Analysis Starting Date: 12/10/2022
Sampled Date & Time: 11/10/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 13/10/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 12/10/2022 10:00

Thermotolerant coliforms	1	cfu/ml	1
--------------------------	---	--------	---

SAMPLE CODE 726-2022-00037486

Client Reference: 22-Oc0019899
Sample described as: SW4A
Reception Date: 12/10/2022
Analysis Starting Date: 12/10/2022
Sampled Date & Time: 11/10/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 13/10/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 12/10/2022 10:00

Thermotolerant coliforms	16	cfu/ml	1
--------------------------	----	--------	---

SAMPLE CODE 726-2022-00037487

Client Reference: 22-Oc0019900
Sample described as: SW5
Reception Date: 12/10/2022
Analysis Starting Date: 12/10/2022
Sampled Date & Time: 11/10/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 13/10/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 12/10/2022 10:00

Thermotolerant coliforms	2	cfu/ml	1
--------------------------	---	--------	---

SAMPLE CODE 726-2022-00037488

Client Reference: 22-Oc0019901
Sample described as: SW6
Reception Date: 12/10/2022
Analysis Starting Date: 12/10/2022
Sampled Date & Time: 11/10/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 13/10/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 12/10/2022 10:00

Thermotolerant coliforms	2	cfu/ml	1
--------------------------	---	--------	---

SAMPLE CODE 726-2022-00037489

Client Reference: 22-Oc0019902
Sample described as: SW7
Reception Date: 12/10/2022
Analysis Starting Date: 12/10/2022
Sampled Date & Time: 11/10/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 13/10/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 12/10/2022 10:00

Thermotolerant coliforms	1	cfu/10 ml	1
--------------------------	---	-----------	---

SAMPLE CODE 726-2022-00037490

Client Reference: 22-Oc0019903
Sample described as: SW11
Reception Date: 12/10/2022
Analysis Starting Date: 12/10/2022
Sampled Date & Time: 11/10/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 13/10/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 12/10/2022 10:00

Thermotolerant coliforms	9	cfu/ml	1
--------------------------	---	--------	---

SAMPLE CODE 726-2022-00037491

Client Reference: 22-Oc0019904
Sample described as: BASIN 1
Reception Date: 12/10/2022
Analysis Starting Date: 12/10/2022
Sampled Date & Time: 11/10/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 13/10/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 12/10/2022 10:00

Thermotolerant coliforms	36	cfu/10 ml	1
--------------------------	----	-----------	---

SAMPLE CODE 726-2022-00037492

Client Reference: 22-Oc0019905
Sample described as: BASIN 2
Reception Date: 12/10/2022
Analysis Starting Date: 12/10/2022
Sampled Date & Time: 11/10/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 13/10/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 12/10/2022 10:00

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

SAMPLE CODE 726-2022-00037493

Client Reference: 22-Oc0019906
Sample described as: BASIN 3
Reception Date: 12/10/2022
Analysis Starting Date: 12/10/2022
Sampled Date & Time: 11/10/2022 12:00:00

Reception temperature: 5.3 °C
Analysis Ending Date: 13/10/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 12/10/2022 10:00

Thermotolerant coliforms	<1	cfu/ml	1
--------------------------	----	--------	---

LIST OF METHODS

 VQ792 **Thermotolerant Coliforms:** AS 4276.7

Signature
Di Shen Scientist

EXPLANATORY NOTE

- ◆ Test is not accredited
- Test is subcontracted within Eurofins group and is accredited
- Test is subcontracted within Eurofins group and is not accredited
- Test is subcontracted outside Eurofins group and is accredited
- Test is subcontracted outside Eurofins group and is not accredited

N/A means Not applicable

Not Detected means not detected at or above the Limit of Quantification (LOQ)

LOQ Limit of Quantification

U Measurement Uncertainty

< Less than, ≤ Less than or equal to

> Greater than, ≥ Greater than or equal to

The tests are identified by a 5 digit code, full details can be provided on request.

Information supplied by the client. This information can have an impact on the validity of results.

Samples are tested as received and the results relate only to the sample tested.

Analysis date is reported as the start date of extraction for a method.

The results may not be reproduced except in full, without a written approval from the laboratory.

Eurofins General Terms and Conditions apply.

END OF REPORT
Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/food-testing>

Accredited for compliance with ISO/IEC 17025 - Testing

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Accreditation Number 20293



GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **Leslie Maranciak**

Report **930744-W**
Project name **AURIZON HEXHAM WATER MONITORING**
Project ID **12584780**
Received Date **Oct 11, 2022**

Client Sample ID			SW1	SW2	SW3	SW4
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Oc0019895	M22- Oc0019896	M22- Oc0019897	M22- Oc0019898
Date Sampled			Oct 11, 2022	Oct 11, 2022	Oct 11, 2022	Oct 11, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	0.15	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	0.1	0.2	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	0.1	0.35	< 0.1	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	0.2	0.3	0.2	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	0.2	0.3	0.2	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	98	101	101	95
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID Sample Matrix			SW1 Water M22- Oc0019895 Oct 11, 2022	SW2 Water M22- Oc0019896 Oct 11, 2022	SW3 Water M22- Oc0019897 Oct 11, 2022	SW4 Water M22- Oc0019898 Oct 11, 2022
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	58	64	75	121
p-Terphenyl-d14 (surr.)	1	%	127	87	116	88
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	0.15	0.04	0.47	0.08
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	5.1	7.1	< 5
Conductivity (at 25 °C)						
Conductivity (at 25 °C)	10	uS/cm	880	1100	1300	1900
Dissolved Oxygen						
Dissolved Oxygen	0.01	mg/L	9.0	9.2	8.2	8.9
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	7.8	8.0	7.5	7.9
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.95	0.45	6.5	1.5
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	1.9	1.1	6.4	0.8
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	1.9	1.1	6.4	0.8
Total Suspended Solids Dried at 103 °C to 105 °C						
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	13	7.5	40	48
Turbidity						
Turbidity	1	NTU	24	4.1	150	11
Heavy Metals						
Aluminium						
Aluminium	0.05	mg/L	0.47	0.12	8.9	0.07
Arsenic						
Arsenic	0.001	mg/L	0.003	0.002	0.006	0.002
Cadmium						
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	0.0003	< 0.0002
Chromium						
Chromium	0.001	mg/L	< 0.001	< 0.001	0.011	< 0.001
Copper						
Copper	0.001	mg/L	0.004	0.001	0.013	< 0.001
Iron						
Iron	0.05	mg/L	2.1	1.8	12	5.9
Lead						
Lead	0.001	mg/L	0.004	< 0.001	0.012	< 0.001
Mercury						
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel						
Nickel	0.001	mg/L	0.005	0.004	0.017	0.004
Zinc						
Zinc	0.005	mg/L	0.012	< 0.005	0.052	< 0.005
Pathogens						
Thermotolerant Coliforms (CFU)						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID Sample Matrix			SW4A Water M22- Oc0019899 Oct 11, 2022	SW5 Water M22- Oc0019900 Oct 11, 2022	SW6 Water M22- Oc0019901 Oct 11, 2022	SW7 Water M22- Oc0019902 Oct 11, 2022
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	0.15
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	0.15
Naphthalene^{N02}						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			SW4A	SW5	SW6	SW7
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Oc0019899	M22- Oc0019900	M22- Oc0019901	M22- Oc0019902
Date Sampled			Oct 11, 2022	Oct 11, 2022	Oct 11, 2022	Oct 11, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	0.2
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	0.2
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	100	100	93	97
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	136	59	64	134
p-Terphenyl-d14 (surr.)	1	%	76	122	76	54
Water Quality Parameters						
Ammonia (as N)	0.01	mg/L	0.03	0.26	< 0.01	0.50
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	5.3	< 5	< 5
Conductivity (at 25 °C)	10	uS/cm	2500	1400	1100	1600
Dissolved Oxygen	0.01	mg/L	7.8	7.9	9.0	7.8
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
pH (at 25 °C)	0.1	pH Units	7.9	6.9	7.5	6.7
Phosphate total (as P)	0.01	mg/L	5.1	5.2	0.43	0.12
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	1.8	1.8	1.5	1.7
Total Nitrogen (as N)*	0.2	mg/L	1.8	1.8	1.5	1.7
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	12	170	37	25
Turbidity	1	NTU	21	15	7.0	7.4

Client Sample ID			SW4A	SW5	SW6	SW7
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Oc0019899	M22- Oc0019900	M22- Oc0019901	M22- Oc0019902
Date Sampled			Oct 11, 2022	Oct 11, 2022	Oct 11, 2022	Oct 11, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	0.37	6.0	0.10	0.19
Arsenic	0.001	mg/L	0.003	0.11	0.004	0.003
Cadmium	0.0002	mg/L	< 0.0002	< 0.002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.01	< 0.001	< 0.001
Copper	0.001	mg/L	0.002	0.046	< 0.001	< 0.001
Iron	0.05	mg/L	18	390	41	32
Lead	0.001	mg/L	0.001	0.022	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.006	0.31	0.005	0.032
Zinc	0.005	mg/L	0.014	0.81	0.009	0.063
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			SW11	BASIN 1	BASIN 2	BASIN 3
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Oc0019903	M22- Oc0019904	M22- Oc0019905	M22- Oc0019906
Date Sampled			Oct 11, 2022	Oct 11, 2022	Oct 11, 2022	Oct 11, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	0.12	< 0.05	< 0.05	0.63
TRH C15-C28	0.1	mg/L	0.3	< 0.1	< 0.1	0.4
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	0.42	< 0.1	< 0.1	1.03
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	0.36
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	0.36
TRH >C16-C34	0.1	mg/L	0.4	< 0.1	0.1	0.5
TRH >C34-C40	0.1	mg/L	0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	0.5	< 0.1	0.1	0.86
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	98	98	99	99
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b,j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			SW11	BASIN 1	BASIN 2	BASIN 3
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- Oc0019903	M22- Oc0019904	M22- Oc0019905	M22- Oc0019906
Date Sampled			Oct 11, 2022	Oct 11, 2022	Oct 11, 2022	Oct 11, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	52	138	103	100
p-Terphenyl-d14 (surr.)	1	%	95	126	128	115
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	0.13	< 0.01	0.04	< 0.01
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	< 5	8.8	< 5
Conductivity (at 25 °C)						
Conductivity (at 25 °C)	10	uS/cm	670	720	890	890
Dissolved Oxygen						
Dissolved Oxygen	0.01	mg/L	8.6	9.3	7.8	8.8
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	7.6	7.8	7.6	7.1
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	1.0	0.20	0.30	0.22
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	3.1	0.6	2.9	4.0
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	3.1	0.6	2.9	4
Total Suspended Solids Dried at 103 °C to 105 °C						
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	13	6.6	31	65
Turbidity						
Turbidity	1	NTU	10	3.3	5.0	2.8
Heavy Metals						
Aluminium						
Aluminium	0.05	mg/L	0.37	< 0.05	0.05	< 0.05
Arsenic						
Arsenic	0.001	mg/L	0.002	0.001	0.001	< 0.001
Cadmium						
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium						
Chromium	0.001	mg/L	0.001	< 0.001	< 0.001	< 0.001
Copper						
Copper	0.001	mg/L	0.002	< 0.001	0.001	< 0.001
Iron						
Iron	0.05	mg/L	2.3	0.10	1.3	1.9
Lead						
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury						
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel						
Nickel	0.001	mg/L	0.004	< 0.001	0.006	0.011
Zinc						
Zinc	0.005	mg/L	0.006	< 0.005	0.006	0.010
Pathogens						
Thermotolerant Coliforms (CFU)						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 12, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 12, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 12, 2022	7 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Melbourne	Oct 12, 2022	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Oct 12, 2022	7 Days
Ammonia (as N) - Method: APHA 4500-NH3 Ammonia Nitrogen by FIA	Melbourne	Oct 12, 2022	28 Days
Biochemical Oxygen Demand (BOD-5 Day) - Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water	Melbourne	Oct 12, 2022	2 Days
Conductivity (at 25 °C) - Method: LTM-INO-4030 Conductivity	Melbourne	Oct 12, 2022	28 Days
Dissolved Oxygen - Method: APHA 4500-O B, C, G using Dissolved Oxygen analyser	Melbourne	Oct 13, 2022	28 Days
pH (at 25 °C) - Method: LTM-GEN-7090 pH in water by ISE	Melbourne	Oct 12, 2022	0 Hours
Total Suspended Solids Dried at 103 °C to 105 °C - Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry	Melbourne	Oct 12, 2022	7 Days
Turbidity - Method: Turbidity by classical using APHA 2130B (LTM-INO-4140)	Melbourne	Oct 13, 2022	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Oct 12, 2022	28 Days
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N) - Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA	Melbourne	Oct 12, 2022	28 Days
Total Kjeldahl Nitrogen (as N) - Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA	Melbourne	Oct 12, 2022	28 Days
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphate total (as P) - Method: LTM-INO-4040 Phosphate by CFA	Melbourne	Oct 12, 2022	28 Days

ABN: 50 005 085 521

ABN: 91 05 0159 898

NZBN: 9429046024954

Melbourne
6 Monterey Road
Dandenong South
VIC 3175
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Geelong
19/8 Lewalan Street
Grovedale
VIC 3216
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Sydney
179 Magowar Road
Girraween
NSW 2145
Tel: +61 2 9900 8400
NATA# 1261 Site# 18217

Canberra
Unit 1,2 Dacre Street
Mitchell
ACT 2911
Tel: +61 2 6113 8091

Brisbane
1/21 Smallwood Place
Murarrie
QLD 4172
Tel: +61 7 3902 4600
NATA# 1261 Site# 20794

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Tel: +61 2 4968 8448
NATA# 1261 Site# 25079

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Auckland
35 O'Rorke Road
Penrose,
Auckland 1061
Tel: +64 9 526 45 51
IANZ# 1327

Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Company Name:	GHD Pty Ltd NEWCASTLE	Order No.:	12584780	Received:	Oct 11, 2022 12:40 PM
Address:	3/24 Honeysuckle Dve Newcastle NSW 2300	Report #:	930744	Due:	Oct 18, 2022
Project Name:	AURIZON HEXHAM WATER MONITORING	Phone:	02 4979 9999	Priority:	5 Day
Project ID:	12584780	Fax:	02 4979 9988	Contact Name:	Leslie Maranciak

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Ammonia (as N)	Arsenic	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Chromium	Conductivity (at 25 °C)	Copper	Iron	Lead	Mercury	Nickel	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103 °C to 105 °C	Turbidity	Zinc	Eurofins Suite B4	Eurofins Suite B19A: Total N (TKN, NOx), Total P
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
External Laboratory																		X						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																			
1	SW1	Oct 11, 2022		Water	M22-Oc0019895	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	SW2	Oct 11, 2022		Water	M22-Oc0019896	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	SW3	Oct 11, 2022		Water	M22-Oc0019897	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	SW4	Oct 11, 2022		Water	M22-Oc0019898	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	SW4A	Oct 11, 2022		Water	M22-Oc0019899	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	SW5	Oct 11, 2022		Water	M22-Oc0019900	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	SW6	Oct 11, 2022		Water	M22-Oc0019901	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	SW7	Oct 11, 2022		Water	M22-Oc0019902	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9	SW11	Oct 11, 2022		Water	M22-Oc0019903	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10	BASIN 1	Oct 11, 2022		Water	M22-Oc0019904	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11	BASIN 2	Oct 11, 2022		Water	M22-Oc0019905	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	BASIN 3	Oct 11, 2022		Water	M22-Oc0019906	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	mg/L	< 5			5	Pass	
Conductivity (at 25 °C)	uS/cm	< 10			10	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Phosphate total (as P)	mg/L	< 0.01			0.01	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	mg/L	< 5			5	Pass	
Turbidity	NTU	< 1			1	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/L	< 0.05			0.05	Pass	
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper	mg/L	< 0.001			0.001	Pass	
Iron	mg/L	< 0.05			0.05	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	124			70-130	Pass	
TRH C10-C14	%	118			70-130	Pass	
Naphthalene	%	102			70-130	Pass	
TRH C6-C10	%	117			70-130	Pass	
TRH >C10-C16	%	117			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	94			70-130	Pass	
Toluene	%	106			70-130	Pass	
Ethylbenzene	%	109			70-130	Pass	
m&p-Xylenes	%	108			70-130	Pass	
Xylenes - Total*	%	108			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	79			70-130	Pass	
Acenaphthylene	%	81			70-130	Pass	
Anthracene	%	108			70-130	Pass	
Benz(a)anthracene	%	75			70-130	Pass	
Benzo(a)pyrene	%	84			70-130	Pass	
Benzo(b&j)fluoranthene	%	113			70-130	Pass	
Benzo(g,h,i)perylene	%	110			70-130	Pass	
Benzo(k)fluoranthene	%	107			70-130	Pass	
Chrysene	%	96			70-130	Pass	
Dibenz(a,h)anthracene	%	82			70-130	Pass	
Fluoranthene	%	76			70-130	Pass	
Fluorene	%	86			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	86			70-130	Pass	
Naphthalene	%	72			70-130	Pass	
Phenanthrene	%	108			70-130	Pass	
Pyrene	%	79			70-130	Pass	
LCS - % Recovery							
Ammonia (as N)	%	102			70-130	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	%	113			85-115	Pass	
Conductivity (at 25 °C)	%	97			70-130	Pass	
Nitrate & Nitrite (as N)	%	108			70-130	Pass	
Phosphate total (as P)	%	97			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	104			70-130	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	%	98			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium	%	97			80-120	Pass	
Arsenic	%	93			80-120	Pass	
Cadmium	%	96			80-120	Pass	
Chromium	%	95			80-120	Pass	
Copper	%	92			80-120	Pass	
Iron	%	91			80-120	Pass	

Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Lead			%	93		80-120	Pass	
Mercury			%	105		80-120	Pass	
Nickel			%	92		80-120	Pass	
Zinc			%	93		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Total Recoverable Hydrocarbons				Result 1				
TRH C6-C9	L22-Oc0022364	NCP	%	120		70-130	Pass	
TRH C10-C14	M22-Oc0017872	NCP	%	90		70-130	Pass	
Naphthalene	L22-Oc0022364	NCP	%	101		70-130	Pass	
TRH C6-C10	L22-Oc0022364	NCP	%	125		70-130	Pass	
TRH >C10-C16	M22-Oc0017872	NCP	%	90		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	L22-Oc0022364	NCP	%	102		70-130	Pass	
Toluene	L22-Oc0022364	NCP	%	110		70-130	Pass	
Ethylbenzene	L22-Oc0022364	NCP	%	110		70-130	Pass	
m&p-Xylenes	L22-Oc0022364	NCP	%	108		70-130	Pass	
o-Xylene	L22-Oc0022364	NCP	%	109		70-130	Pass	
Xylenes - Total*	L22-Oc0022364	NCP	%	108		70-130	Pass	
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	M22-Oc0021820	NCP	%	88		70-130	Pass	
Acenaphthylene	M22-Oc0021820	NCP	%	89		70-130	Pass	
Anthracene	M22-Oc0021820	NCP	%	77		70-130	Pass	
Benz(a)anthracene	M22-Oc0021820	NCP	%	85		70-130	Pass	
Benzo(a)pyrene	M22-Oc0021820	NCP	%	96		70-130	Pass	
Benzo(b&j)fluoranthene	M22-Oc0021820	NCP	%	117		70-130	Pass	
Benzo(g,h,i)perylene	M22-Oc0021820	NCP	%	78		70-130	Pass	
Benzo(k)fluoranthene	M22-Oc0021820	NCP	%	114		70-130	Pass	
Chrysene	M22-Oc0021820	NCP	%	110		70-130	Pass	
Dibenz(a,h)anthracene	M22-Oc0021820	NCP	%	76		70-130	Pass	
Fluoranthene	M22-Oc0021820	NCP	%	88		70-130	Pass	
Fluorene	M22-Oc0021820	NCP	%	98		70-130	Pass	
Indeno(1,2,3-cd)pyrene	M22-Oc0021820	NCP	%	87		70-130	Pass	
Naphthalene	M22-Oc0021820	NCP	%	78		70-130	Pass	
Phenanthrene	M22-Oc0021820	NCP	%	79		70-130	Pass	
Pyrene	M22-Oc0021820	NCP	%	91		70-130	Pass	
Spike - % Recovery								
				Result 1				
Ammonia (as N)	M22-Oc0022027	NCP	%	82		70-130	Pass	
Nitrate & Nitrite (as N)	M22-Oc0022027	NCP	%	82		70-130	Pass	
Total Kjeldahl Nitrogen (as N)	M22-Oc0020898	NCP	%	97		70-130	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	M22-Oc0021365	NCP	%	99		70-130	Pass	
Spike - % Recovery								
				Result 1				
Phosphate total (as P)	S22-Oc0005577	NCP	%	94		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Aluminium	M22-Oc0019904	CP	%	104		75-125	Pass	
Arsenic	M22-Oc0019904	CP	%	97		75-125	Pass	
Cadmium	M22-Oc0019904	CP	%	96		75-125	Pass	
Chromium	M22-Oc0019904	CP	%	98		75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper	M22-Oc0019904	CP	%	96			75-125	Pass	
Iron	M22-Oc0019904	CP	%	94			75-125	Pass	
Lead	M22-Oc0019904	CP	%	97			75-125	Pass	
Mercury	M22-Oc0019904	CP	%	106			75-125	Pass	
Nickel	M22-Oc0019904	CP	%	94			75-125	Pass	
Zinc	M22-Oc0019904	CP	%	96			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	L22-Oc0022362	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	L22-Oc0014175	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	L22-Oc0014175	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	L22-Oc0014175	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Naphthalene	L22-Oc0022362	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	L22-Oc0022362	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	L22-Oc0014175	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	L22-Oc0014175	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	L22-Oc0014175	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	L22-Oc0022362	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	L22-Oc0022362	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	L22-Oc0022362	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	L22-Oc0022362	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	L22-Oc0022362	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	L22-Oc0022362	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g,h,i)perylene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a,h)anthracene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	L22-Oc0014175	NCP	mg/L	0.008	0.008	2.5	30%	Pass	
Phenanthrene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	L22-Oc0014175	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	M22-Oc0020897	NCP	mg/L	0.02	< 0.01	170	30%	Fail	Q15
Biochemical Oxygen Demand (BOD-5 Day)	M22-Oc0019765	NCP	mg/L	< 5	< 5	<1	30%	Pass	
Conductivity (at 25 °C)	M22-Oc0020895	NCP	uS/cm	480	480	<1	30%	Pass	
Nitrate & Nitrite (as N)	M22-Oc0020897	NCP	mg/L	0.07	0.08	23	30%	Pass	
pH (at 25 °C)	M22-Oc0020895	NCP	pH Units	6.7	6.6	pass	30%	Pass	
Phosphate total (as P)	M22-Oc0021820	NCP	mg/L	0.50	0.46	7.2	30%	Pass	

Duplicate				Result 1	Result 2	RPD		
Total Kjeldahl Nitrogen (as N)	M22-Oc0022028	NCP	mg/L	1.0	1.0	1.0	30%	Pass
Total Suspended Solids Dried at 103 °C to 105 °C	M22-Oc0019869	NCP	mg/L	130	130	<1	30%	Pass
Turbidity	B22-Oc0018134	NCP	NTU	67	68	1.8	30%	Pass
Duplicate				Result 1	Result 2	RPD		
Dissolved Oxygen	M22-Oc0019898	CP	mg/L	8.9	8.9	<1	30%	Pass
Duplicate				Result 1	Result 2	RPD		
Heavy Metals				Result 1	Result 2	RPD		
Aluminium	M22-Oc0019904	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Arsenic	M22-Oc0019904	CP	mg/L	0.001	0.001	4.9	30%	Pass
Cadmium	M22-Oc0019904	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium	M22-Oc0019904	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper	M22-Oc0019904	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Iron	M22-Oc0019904	CP	mg/L	0.10	0.10	<1	30%	Pass
Lead	M22-Oc0019904	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury	M22-Oc0019904	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	M22-Oc0019904	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Zinc	M22-Oc0019904	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass

Comments

Thermotolerant coliforms analysed by; Eurofins Food testing; accreditation number 20293; report reference AR-22-NV_013464-01

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Andrew Black	Analytical Services Manager
Caitlin Breeze	Senior Analyst-Inorganic
Edward Lee	Senior Analyst-Organic
Harry Bacalis	Senior Analyst-Volatile
Joseph Edouard	Senior Analyst-Organic
Mary Makarios	Senior Analyst-Inorganic
Mary Makarios	Senior Analyst-Metal
Scott Beddoes	Senior Analyst-Inorganic
Vivian Wang	Senior Analyst-Volatile



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne 6 Monterey Road Dandenong South VIC 3175 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Geelong 19/8 Lewalan Street Grovedale VIC 3216 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Sydney 179 Magowar Road Girraween NSW 2145 Tel: +61 2 9900 8400 NATA# 1261 Site# 18217
---	---	--

Canberra Unit 1,2 Dacre Street Mitchell ACT 2911 Tel: +61 2 6113 8091	Brisbane 1/21 Smallwood Place Murarie QLD 4172 Tel: +61 7 3902 4600 NATA# 1261 Site# 20794	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Tel: +61 2 4968 8448 NATA# 1261 Site# 25079
--	--	---

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland 35 O'Rorke Road Penrose, Auckland 1061 Tel: +64 9 526 45 51 IANZ# 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Tel: 0800 856 450 IANZ# 1290
---	---

Sample Receipt Advice

Company name: GHD Pty Ltd NEWCASTLE
Contact name: Leslie Maranciak
Project name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780
Turnaround time: 5 Day
Date/Time received: Oct 11, 2022 12:40 PM
Eurofins reference: 930744

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 7.5 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✓ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Leslie Maranciak - leslie.maranciak@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NEWCASTLE email address.



Sydney

Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
 Phone: +612 9900 8400
 Email: enviro.syd@mgslabmark.com.au

Brisbane

Unit 1-21 Smallwood Place, Murrumbidgee
 Phone: +617 3902 4800
 Email: enviro.bns@mgslabmark.com.au

Melbourne

2 Kingston Town Close, Oakleigh, VIC 3166
 Phone: +613 8564 5909 Fax: +613 8564 5090
 Email: enquiries.melb@mgslabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name: GHD	Contact Name: Lachlan Parkinson	Purchase Order: 12584780	Page 1 of 1
Office Address: L3, 24 Honeysuckle Drive	Project Manager: Leslie Marandjak	PROJECT Number: 12584780	COC Number:
Newcastle 2300	Email for results: Leslie.Marandjak@ghd.com Lachlan.Parkinson@ghd.com	PROJECT Name: Aurizon Hexham Water Monitoring	Eurofins | mgt quote ID: 180501GHD
			Data output format: ESDAT

Special Directions & Comments:

Please ensure faecal coliforms are reported in CFU/100ml

Eurofins | mgt OI water batch number:

Analytes

Sample ID	Date	Matrix	B4 (BTEXN / TRH / PAH)	Total Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	Sulfate BSA (Nutrients, Total N (TRN, NOX), Total P	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day
1	11/10/22	W	X	X	X	X	X	X	X
2		W	X	X	X	X	X	X	X
3		W	X	X	X	X	X	X	X
4		W	X	X	X	X	X	X	X
5		W	X	X	X	X	X	X	X
6		W	X	X	X	X	X	X	X
7		W	X	X	X	X	X	X	X
8		W	X	X	X	X	X	X	X
9			X	X	X	X	X	X	X
10			X	X	X	X	X	X	X
11			X	X	X	X	X	X	X
12		W	X	X	X	X	X	X	X
13		W	X	X	X	X	X	X	X
14		W	X	X	X	X	X	X	X
15		W	X	X	X	X	X	X	X
16									
17									
18									
19									
20									

Some common holding times (with correct preservation).

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BCD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1L P	250P	125P	1LA	40ml vial	125ml A	Jar
------	------	------	-----	-----------	---------	-----

Sample comments:

Relinquished By: L Parkinson	Received By: Jake Slone	Laboratory Staff	Turn around time	Method Of Shipment	Temperature on arrival:
Date & Time: 11/10/22	Date & Time: 11/10/22 12:40 PM		1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/> 4 DAY <input type="checkbox"/> SOA <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Courier <input type="checkbox"/> Hand Delivered	7.5
Signature: [Signature]	Signature: [Signature]			930744	Report number:

Jake

ANALYTICAL REPORT

REPORT CODE
AR-22-NV-016547-01
REPORT DATE
09/12/2022

Eurofins Environment Testing Australia Pty Ltd

For the attention of **Analytical Reports**
 6 Monterey Road
 Dandenong South
 3175 Melbourne
 AUSTRALIA

Phone
Email EnviroReportsau@eurofins.com

Contact for your orders:

Ruvini Herath

Order code:

EUAUTWU-00025992

Submission Reference:

 Merged from order
 cau001-order-948325-221208.xml

Purchase Order Number:

948325

SAMPLE CODE
726-2022-00044673
Client Reference:

22-De0017897

Sample described as:

101R

Reception Date:

08/12/2022

Analysis Starting Date:

08/12/2022

Sampled Date & Time:

07/12/2022 12:00:00

Reception temperature:

5.4 °C

Analysis Ending Date:

09/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 8/12/2022 17:45

Thermotolerant coliforms

<1 cfu/10 ml

1

SAMPLE CODE
726-2022-00044674
Client Reference:

22-De0017898

Sample described as:

MW106R

Reception Date:

08/12/2022

Analysis Starting Date:

08/12/2022

Sampled Date & Time:

07/12/2022 12:00:00

Reception temperature:

5.4 °C

Analysis Ending Date:

09/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 8/12/2022 17:45

Thermotolerant coliforms

5 cfu/ml

1

SAMPLE CODE
726-2022-00044675
Client Reference:

22-De0017899

Sample described as:

MW109

Reception Date:

08/12/2022

Analysis Starting Date:

08/12/2022

Sampled Date & Time:

07/12/2022 12:00:00

Reception temperature:

5.4 °C

Analysis Ending Date:

09/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 8/12/2022 17:45

Thermotolerant coliforms

15 cfu/10 ml

1

Eurofins Food Testing Australia Pty Ltd

 6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

https://www.eurofins.com.au/food-testing

 Accredited for compliance with ISO/IEC
 17025 - Testing

 NATA is a signatory to the ILAC Mutual
 Recognition Arrangement for the mutual
 recognition of the equivalence of testing,
 medical testing, calibration, inspection,
 proficiency testing scheme providers and
 reference materials producers reports and
 certificates.

Accreditation Number 20293



SAMPLE CODE 726-2022-00044676

Client Reference: 22-De0017900
Sample described as: MW301R
Reception Date: 08/12/2022
Analysis Starting Date: 08/12/2022
Sampled Date & Time: 07/12/2022 12:00:00

Reception temperature: 5.4 °C
Analysis Ending Date: 09/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 8/12/2022 17:45

Thermotolerant coliforms	<1	cfu/10 ml	1
--------------------------	----	-----------	---

SAMPLE CODE 726-2022-00044677

Client Reference: 22-De0017901
Sample described as: MW302R
Reception Date: 08/12/2022
Analysis Starting Date: 08/12/2022
Sampled Date & Time: 07/12/2022 12:00:00

Reception temperature: 5.4 °C
Analysis Ending Date: 09/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 8/12/2022 17:45

Thermotolerant coliforms	2	cfu/ml	1
--------------------------	---	--------	---

SAMPLE CODE 726-2022-00044678

Client Reference: 22-De0017903
Sample described as: SW9
Reception Date: 08/12/2022
Analysis Starting Date: 08/12/2022
Sampled Date & Time: 07/12/2022 12:00:00

Reception temperature: 5.4 °C
Analysis Ending Date: 09/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 8/12/2022 17:45

Thermotolerant coliforms	1	cfu/100 ml	1
--------------------------	---	------------	---

SAMPLE CODE 726-2022-00044679

Client Reference: 22-De0017904
Sample described as: BASIN 1
Reception Date: 08/12/2022
Analysis Starting Date: 08/12/2022
Sampled Date & Time: 07/12/2022 12:00:00

Reception temperature: 5.4 °C
Analysis Ending Date: 09/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 8/12/2022 17:45

Thermotolerant coliforms	38	cfu/ml	1
--------------------------	----	--------	---

LIST OF METHODS

VQ792 Thermotolerant Coliforms: AS 4276.7

Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/food-testing>

Accredited for compliance with ISO/IEC 17025 - Testing
 NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
 Accreditation Number 20293



Signature



Di Shen Scientist

EXPLANATORY NOTE

- ◆ Test is not accredited
- Test is subcontracted within Eurofins group and is accredited
- Test is subcontracted within Eurofins group and is not accredited
- Test is subcontracted outside Eurofins group and is accredited
- Test is subcontracted outside Eurofins group and is not accredited

N/A means Not applicable

Not Detected means not detected at or above the Limit of Quantification (LOQ)

LOQ Limit of Quantification

U Measurement Uncertainty

< Less than, ≤ Less than or equal to

> Greater than, ≥ Greater than or equal to

The tests are identified by a 5 digit code, full details can be provided on request.

Information supplied by the client. This information can have an impact on the validity of results.

Samples are tested as received and the results relate only to the sample tested.

Analysis date is reported as the start date of extraction for a method.

The results may not be reproduced except in full, without a written approval from the laboratory.

Eurofins General Terms and Conditions apply.

END OF REPORT

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **Leslie Maranciak**

Report **948325-W**
Project name **AURIZON HEXHAM WATER MONITORING**
Project ID **12584780**
Received Date **Dec 07, 2022**

Client Sample ID			101R	MW106R	MW109	MW301R
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22- De0017897	M22- De0017898	M22- De0017899	M22- De0017900
Date Sampled			Dec 07, 2022	Dec 07, 2022	Dec 07, 2022	Dec 07, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	96	100	101	100
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			101R	MW106R	MW109	MW301R
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22-De0017897	M22-De0017898	M22-De0017899	M22-De0017900
Date Sampled			Dec 07, 2022	Dec 07, 2022	Dec 07, 2022	Dec 07, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	59	107	102	81
p-Terphenyl-d14 (surr.)	1	%	94	67	125	54
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	3.8	0.10	0.52	^{R09} 3.7
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	< 5	< 5	< 5
Conductivity (at 25 °C)						
Conductivity (at 25 °C)	10	uS/cm	9800	790	4500	15000
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	7.4	7.7	7.9	8.1
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.23	0.17	5.2	1.7
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	9.5	0.5	4.0	^{R09} 3.6
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	9.5	0.5	4	3.6
Total Suspended Solids Dried at 103 °C to 105 °C						
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	24	130	720	64
Turbidity						
Turbidity	1	NTU	310	140	310	150
Heavy Metals						
Aluminium (filtered)						
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.5	< 0.5	< 0.05
Arsenic (filtered)						
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.01	< 0.01	0.001
Cadmium (filtered)						
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.002	< 0.002	< 0.0002
Chromium (filtered)						
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.01	< 0.01	< 0.001
Copper (filtered)						
Copper (filtered)	0.001	mg/L	0.017	< 0.01	< 0.01	< 0.001
Iron (filtered)						
Iron (filtered)	0.05	mg/L	6.6	< 0.5	< 0.5	7.3
Lead (filtered)						
Lead (filtered)	0.001	mg/L	< 0.001	< 0.01	< 0.01	< 0.001
Mercury (filtered)						
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.001	< 0.001	< 0.0001
Nickel (filtered)						
Nickel (filtered)	0.001	mg/L	0.005	0.010	< 0.01	0.002
Zinc (filtered)						
Zinc (filtered)	0.005	mg/L	< 0.005	< 0.05	< 0.05	< 0.005
Pathogens						
Thermotolerant Coliforms (CFU)						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			MW302R	FD01	SW9	BASIN 1
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22-De0017901	M22-De0017902	M22-De0017903	M22-De0017904
Date Sampled			Dec 07, 2022	Dec 07, 2022	Dec 07, 2022	Dec 07, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	0.06
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	0.2
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	0.3
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	0.06
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	0.06
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	0.05

Client Sample ID			MW302R	FD01	SW9	BASIN 1
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22-De0017901	M22-De0017902	M22-De0017903	M22-De0017904
Date Sampled			Dec 07, 2022	Dec 07, 2022	Dec 07, 2022	Dec 07, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	0.3
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	0.35
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	98	96	104	102
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	110	67	108	125
p-Terphenyl-d14 (surr.)	1	%	90	100	58	92
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	1.4	-	0.02	3.0
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	-	< 5	240
Conductivity (at 25 °C)						
Conductivity (at 25 °C)	10	uS/cm	2400	-	32000	1100
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	0.21	< 0.05
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	6.8	-	8.0	7.7
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.33	0.31	0.08	1.9
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	1.7	1.9	0.2	34
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	1.7	1.9	0.41	34
Total Suspended Solids Dried at 103 °C to 105 °C						
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	200	-	18	2200
Turbidity						
Turbidity	1	NTU	420	-	4.5	220

Client Sample ID			MW302R	FD01	SW9	BASIN 1
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M22-De0017901	M22-De0017902	M22-De0017903	M22-De0017904
Date Sampled			Dec 07, 2022	Dec 07, 2022	Dec 07, 2022	Dec 07, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	-	-	0.20	8.8
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	-	-
Arsenic	0.001	mg/L	-	-	0.002	0.022
Arsenic (filtered)	0.001	mg/L	0.002	0.002	-	-
Cadmium	0.0002	mg/L	-	-	< 0.0002	< 0.002
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	-	-
Chromium	0.001	mg/L	-	-	< 0.001	0.011
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	-	-
Copper	0.001	mg/L	-	-	< 0.001	0.035
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001	-	-
Iron	0.05	mg/L	-	-	0.34	14
Iron (filtered)	0.05	mg/L	56	44	-	-
Lead	0.001	mg/L	-	-	< 0.001	0.021
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	-	-
Mercury	0.0001	mg/L	-	-	< 0.0001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Nickel	0.001	mg/L	-	-	0.001	0.036
Nickel (filtered)	0.001	mg/L	0.010	0.008	-	-
Zinc	0.005	mg/L	-	-	0.005	0.18
Zinc (filtered)	0.005	mg/L	0.067	0.053	-	-
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	-	see attached	see attached

Client Sample ID			RB01	FB01
Sample Matrix			Water	Water
Eurofins Sample No.			M22-De0017905	M22-De0017907
Date Sampled			Dec 07, 2022	Dec 07, 2022
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons				
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1
BTEX				
Benzene	0.001	mg/L	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001

Client Sample ID			RB01	FB01
Sample Matrix			Water	Water
Eurofins Sample No.			M22-De0017905	M22-De0017907
Date Sampled			Dec 07, 2022	Dec 07, 2022
Test/Reference	LOR	Unit		
BTEX				
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	84	87
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	0.001	mg/L	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	127	130
p-Terphenyl-d14 (surr.)	1	%	95	104
Nitrate & Nitrite (as N)				
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05
Phosphate total (as P)				
Phosphate total (as P)	0.01	mg/L	< 0.01	< 0.01
Total Kjeldahl Nitrogen (as N)				
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	< 0.2	< 0.2
Total Nitrogen (as N)*				
Total Nitrogen (as N)*	0.2	mg/L	< 0.2	< 0.2
Heavy Metals				
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001
Iron (filtered)	0.05	mg/L	< 0.05	< 0.05
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	< 0.001	< 0.001
Zinc (filtered)	0.005	mg/L	< 0.005	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Dec 13, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Dec 13, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Dec 13, 2022	7 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Melbourne	Dec 13, 2022	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Dec 13, 2022	7 Days
Ammonia (as N) - Method: APHA 4500-NH3 Ammonia Nitrogen by FIA	Melbourne	Dec 08, 2022	28 Days
Biochemical Oxygen Demand (BOD-5 Day) - Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water	Melbourne	Dec 08, 2022	2 Days
Conductivity (at 25 °C) - Method: LTM-INO-4030 Conductivity	Melbourne	Dec 08, 2022	28 Days
pH (at 25 °C) - Method: LTM-GEN-7090 pH in water by ISE	Melbourne	Dec 08, 2022	0 Hours
Total Suspended Solids Dried at 103 °C to 105 °C - Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry	Melbourne	Dec 08, 2022	7 Days
Turbidity - Method: Turbidity by classical using APHA 2130B (LTM-INO-4140)	Melbourne	Dec 08, 2022	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Dec 14, 2022	28 Days
Heavy Metals (filtered) - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Dec 13, 2022	180 Days
Mobil Metals : Metals M15 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Dec 13, 2022	28 Days
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N) - Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA	Melbourne	Dec 13, 2022	28 Days
Total Kjeldahl Nitrogen (as N) - Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA	Melbourne	Dec 13, 2022	28 Days
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphate total (as P) - Method: LTM-INO-4040 Phosphate by CFA	Melbourne	Dec 13, 2022	28 Days

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
 Newcastle
 NSW 2300

Order No.:
Report #: 948325
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Dec 7, 2022 2:04 PM
Due: Dec 14, 2022
Priority: 5 Day
Contact Name: Leslie Maranciak

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Aluminium (filtered)	Ammonia (as N)	Arsenic	Arsenic (filtered)	Biochemical Oxygen Demand (BOD-5 Day)	Cadmium	Cadmium (filtered)	CANCELLED	Chromium	Chromium (filtered)	Conductivity (at 25 °C)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103 °C to 105 °C	Turbidity	Zinc	Zinc (filtered)	Eurofins Suite B4	Eurofins Suite B19A: Total N (TKN, NOx), Total P		
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
External Laboratory																												X									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																																
1	101R	Dec 07, 2022		Water	M22-De0017897	X	X		X	X		X				X	X		X		X		X		X		X	X	X	X	X		X	X	X		
2	MW106R	Dec 07, 2022		Water	M22-De0017898	X	X		X	X		X				X	X		X		X		X		X		X	X	X	X	X		X	X	X		
3	MW109	Dec 07, 2022		Water	M22-De0017899	X	X		X	X		X				X	X		X		X		X		X		X	X	X	X	X		X	X	X		
4	MW301R	Dec 07, 2022		Water	M22-De0017900	X	X		X	X		X				X	X		X		X		X		X		X	X	X	X	X		X	X	X		
5	MW302R	Dec 07, 2022		Water	M22-De0017901	X	X		X	X		X				X	X		X		X		X		X		X	X	X	X	X		X	X	X		
6	FD01	Dec 07, 2022		Water	M22-De0017902	X			X			X				X			X		X		X		X		X							X	X	X	
7	SW9	Dec 07, 2022		Water	M22-De0017903	X		X	X		X	X			X		X	X		X		X		X		X		X	X	X	X	X		X	X	X	
8	BASIN 1	Dec 07, 2022		Water	M22-De0017904	X		X	X		X	X			X		X	X		X		X		X		X		X	X	X	X	X		X	X	X	
9	RB01	Dec 07, 2022		Water	M22-De0017905		X			X		X				X			X		X		X		X		X							X	X	X	
10	FD02	Dec 07, 2022		Water	M22-De0017906									X																							
11	FB01	Dec 07, 2022		Water	M22-De0017907		X			X		X				X			X		X		X		X		X							X	X	X	
Test Counts						2	8	7	2	8	7	2	8	1	2	8	7	2	8	2	8	2	8	2	8	2	8	7	7	7	7	7	2	8	10	10	

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	mg/L	< 5			5	Pass	
Conductivity (at 25 °C)	uS/cm	19			10	Fail	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Phosphate total (as P)	mg/L	< 0.01			0.01	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	mg/L	< 5			5	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/L	< 0.05			0.05	Pass	
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Arsenic	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Iron	mg/L	< 0.05			0.05	Pass	
Iron (filtered)	mg/L	< 0.05			0.05	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	75			70-130	Pass	
TRH C10-C14	%	117			70-130	Pass	
TRH C6-C10	%	75			70-130	Pass	
TRH >C10-C16	%	121			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	95			70-130	Pass	
Toluene	%	87			70-130	Pass	
Ethylbenzene	%	77			70-130	Pass	
m&p-Xylenes	%	78			70-130	Pass	
Xylenes - Total*	%	78			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	78			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	128			70-130	Pass	
Acenaphthylene	%	118			70-130	Pass	
Anthracene	%	94			70-130	Pass	
Benz(a)anthracene	%	88			70-130	Pass	
Benzo(a)pyrene	%	86			70-130	Pass	
Benzo(b&j)fluoranthene	%	90			70-130	Pass	
Benzo(g,h,i)perylene	%	104			70-130	Pass	
Benzo(k)fluoranthene	%	130			70-130	Pass	
Chrysene	%	82			70-130	Pass	
Dibenz(a,h)anthracene	%	102			70-130	Pass	
Fluoranthene	%	106			70-130	Pass	
Fluorene	%	116			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	106			70-130	Pass	
Naphthalene	%	106			70-130	Pass	
Phenanthrene	%	92			70-130	Pass	
Pyrene	%	110			70-130	Pass	
LCS - % Recovery							
Ammonia (as N)	%	98			70-130	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	%	87			85-115	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
Conductivity (at 25 °C)	%	100			70-130	Pass		
Nitrate & Nitrite (as N)	%	110			70-130	Pass		
Phosphate total (as P)	%	94			70-130	Pass		
Total Kjeldahl Nitrogen (as N)	%	90			70-130	Pass		
Total Suspended Solids Dried at 103 °C to 105 °C	%	192			70-130	Fail		
LCS - % Recovery								
Heavy Metals								
Aluminium	%	116			80-120	Pass		
Aluminium (filtered)	%	109			80-120	Pass		
Arsenic	%	109			80-120	Pass		
Arsenic (filtered)	%	100			80-120	Pass		
Cadmium	%	110			80-120	Pass		
Cadmium (filtered)	%	99			80-120	Pass		
Chromium	%	112			80-120	Pass		
Chromium (filtered)	%	102			80-120	Pass		
Copper	%	108			80-120	Pass		
Copper (filtered)	%	100			80-120	Pass		
Iron	%	113			80-120	Pass		
Iron (filtered)	%	102			80-120	Pass		
Lead	%	109			80-120	Pass		
Lead (filtered)	%	95			80-120	Pass		
Mercury	%	106			80-120	Pass		
Mercury (filtered)	%	98			80-120	Pass		
Nickel	%	108			80-120	Pass		
Nickel (filtered)	%	101			80-120	Pass		
Zinc	%	110			80-120	Pass		
Zinc (filtered)	%	101			80-120	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Total Recoverable Hydrocarbons				Result 1				
TRH C6-C9	M22-De0019884	NCP	%	100		70-130	Pass	
TRH C6-C10	M22-De0019884	NCP	%	97		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	M22-De0019884	NCP	%	106		70-130	Pass	
Toluene	M22-De0019884	NCP	%	104		70-130	Pass	
Ethylbenzene	M22-De0019884	NCP	%	98		70-130	Pass	
m&p-Xylenes	M22-De0019884	NCP	%	98		70-130	Pass	
o-Xylene	M22-De0019884	NCP	%	102		70-130	Pass	
Xylenes - Total*	M22-De0019884	NCP	%	99		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	M22-De0019884	NCP	%	86		70-130	Pass	
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	N22-De0007281	NCP	%	100		70-130	Pass	
Acenaphthylene	N22-De0007281	NCP	%	96		70-130	Pass	
Anthracene	N22-De0007281	NCP	%	98		70-130	Pass	
Benzo(a)anthracene	N22-De0007281	NCP	%	92		70-130	Pass	
Benzo(a)pyrene	N22-De0007281	NCP	%	91		70-130	Pass	
Benzo(b&j)fluoranthene	N22-De0007281	NCP	%	82		70-130	Pass	
Benzo(g,h,i)perylene	N22-De0007281	NCP	%	83		70-130	Pass	
Benzo(k)fluoranthene	N22-De0007281	NCP	%	92		70-130	Pass	
Chrysene	N22-De0007281	NCP	%	98		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibenz(a,h)anthracene	N22-De0007281	NCP	%	95			70-130	Pass	
Fluoranthene	N22-De0007281	NCP	%	117			70-130	Pass	
Fluorene	N22-De0007281	NCP	%	104			70-130	Pass	
Indeno(1,2,3-cd)pyrene	N22-De0007281	NCP	%	101			70-130	Pass	
Naphthalene	N22-De0007281	NCP	%	90			70-130	Pass	
Phenanthrene	N22-De0007281	NCP	%	100			70-130	Pass	
Pyrene	N22-De0007281	NCP	%	120			70-130	Pass	
Spike - % Recovery									
				Result 1					
Total Kjeldahl Nitrogen (as N)	B22-De0011742	NCP	%	101			70-130	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	M22-De0019354	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium (filtered)	M22-De0019216	NCP	%	90			75-125	Pass	
Arsenic (filtered)	M22-De0019216	NCP	%	92			75-125	Pass	
Cadmium (filtered)	M22-De0019216	NCP	%	85			75-125	Pass	
Chromium (filtered)	M22-De0019216	NCP	%	88			75-125	Pass	
Copper (filtered)	M22-De0019216	NCP	%	84			75-125	Pass	
Iron (filtered)	M22-De0019216	NCP	%	85			75-125	Pass	
Lead (filtered)	M22-De0019216	NCP	%	84			75-125	Pass	
Mercury (filtered)	M22-De0019216	NCP	%	78			75-125	Pass	
Nickel (filtered)	M22-De0019216	NCP	%	85			75-125	Pass	
Zinc (filtered)	M22-De0019216	NCP	%	85			75-125	Pass	
Spike - % Recovery									
				Result 1					
Ammonia (as N)	M22-De0017898	CP	%	90			70-130	Pass	
Nitrate & Nitrite (as N)	M22-De0017898	CP	%	106			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	M22-De0017903	CP	%	100			75-125	Pass	
Arsenic	M22-De0017903	CP	%	94			75-125	Pass	
Cadmium	M22-De0017903	CP	%	84			75-125	Pass	
Chromium	M22-De0017903	CP	%	107			75-125	Pass	
Copper	M22-De0017903	CP	%	82			75-125	Pass	
Iron	M22-De0017903	CP	%	88			75-125	Pass	
Lead	M22-De0017903	CP	%	82			75-125	Pass	
Mercury	M22-De0017903	CP	%	85			75-125	Pass	
Nickel	M22-De0017903	CP	%	85			75-125	Pass	
Zinc	M22-De0017903	CP	%	85			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C10-C14	M22-De0017905	CP	%	97			70-130	Pass	
TRH >C10-C16	M22-De0017905	CP	%	98			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	M22-De0019315	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M22-De0020508	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M22-De0020508	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M22-De0020508	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C6-C10	M22-De0019315	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	M22-De0020508	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M22-De0020508	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M22-De0020508	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	M22-De0019315	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Toluene	M22-De0019315	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Ethylbenzene	M22-De0019315	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
m&p-Xylenes	M22-De0019315	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass
o-Xylene	M22-De0019315	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Xylenes - Total*	M22-De0019315	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	M22-De0019315	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Acenaphthylene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Anthracene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benz(a)anthracene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(a)pyrene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(b&j)fluoranthene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(g,h,i)perylene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(k)fluoranthene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Chrysene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Dibenz(a,h)anthracene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluoranthene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluorene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Naphthalene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Phenanthrene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Pyrene	B22-De0010216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Ammonia (as N)	M22-De0017897	CP	mg/L	3.8	3.6	3.2	30%	Pass
Biochemical Oxygen Demand (BOD-5 Day)	M22-De0019058	NCP	mg/L	8.8	9.9	12	30%	Pass
Conductivity (at 25 °C)	M22-De0015137	NCP	uS/cm	680	670	<1	30%	Pass
Nitrate & Nitrite (as N)	M22-De0017897	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Total Suspended Solids Dried at 103 °C to 105 °C	M22-De0019034	NCP	mg/L	770	600	26	30%	Pass
Turbidity	M22-De0015107	NCP	NTU	45	57	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium (filtered)	M22-De0019216	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Arsenic (filtered)	M22-De0019216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Cadmium (filtered)	M22-De0019216	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium (filtered)	M22-De0019216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper (filtered)	M22-De0019216	NCP	mg/L	0.004	0.004	3.8	30%	Pass
Iron (filtered)	M22-De0019216	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Lead (filtered)	M22-De0019216	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury (filtered)	M22-De0019216	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel (filtered)	M22-De0019216	NCP	mg/L	0.002	0.002	11	30%	Pass
Zinc (filtered)	M22-De0019216	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Phosphate total (as P)	M22-De0017899	CP	mg/L	5.2	5.3	1.5	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
pH (at 25 °C)	M22-De0021648	NCP	pH Units	8.3	8.3	pass	30%	Pass

Duplicate									
				Result 1	Result 2	RPD			
Total Kjeldahl Nitrogen (as N)	M22-De0017901	CP	mg/L	1.7	1.4	19	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	M22-De0017903	CP	mg/L	0.20	0.21	5.4	30%	Pass	
Arsenic	M22-De0017903	CP	mg/L	0.002	0.002	9.3	30%	Pass	
Cadmium	M22-De0017903	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M22-De0017903	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	M22-De0017903	CP	mg/L	< 0.001	0.004	120	30%	Fail	Q15
Iron	M22-De0017903	CP	mg/L	0.34	0.30	11	30%	Pass	
Lead	M22-De0017903	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	M22-De0017903	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M22-De0017903	CP	mg/L	0.001	0.002	19	30%	Pass	
Zinc	M22-De0017903	CP	mg/L	0.005	0.005	1.2	30%	Pass	

Comments

Thermotolerant coliforms analysed by; Eurofins Food testing; accreditation number 20293; report reference AR-22-NV-016547-01

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
R09	Theoretically the TKN result should be greater or equal to the ammonia concentration. However the difference reported is within the measurement uncertainty of the individual tests

Authorised by:

Bonnie Pu	Analytical Services Manager
Caitlin Breeze	Senior Analyst-Inorganic
Edward Lee	Senior Analyst-Organic
Emily Rosenberg	Senior Analyst-Metal
Joseph Edouard	Senior Analyst-Organic
Joseph Edouard	Senior Analyst-Volatile
Mary Makarios	Senior Analyst-Inorganic
Scott Beddoes	Senior Analyst-Inorganic
Scott Beddoes	Senior Analyst-Metal
Vivian Wang	Senior Analyst-Volatile



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne
6 Monterey Road
Dandenong South
VIC 3175
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Geelong
19/8 Lewalan Street
Grovedale
VIC 3216
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Sydney
179 Magowar Road
Girraween
NSW 2145
Tel: +61 2 9900 8400
NATA# 1261 Site# 18217

Canberra
Unit 1,2 Dacre Street
Mitchell
ACT 2911
Tel: +61 2 6113 8091

Brisbane
1/21 Smallwood Place
Murarie
QLD 4172
Tel: +61 7 3902 4600
NATA# 1261 Site# 20794

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Tel: +61 2 4968 8448
NATA# 1261 Site# 25079

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland
35 O'Rorke Road
Penrose,
Auckland 1061
Tel: +64 9 526 45 51
IANZ# 1327

Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

Sample Receipt Advice

Company name: GHD Pty Ltd NEWCASTLE
Contact name: Leslie Maranciak
Project name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780
Turnaround time: 5 Day
Date/Time received: Dec 7, 2022 2:04 PM
Eurofins reference: 948325

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 6.5 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Leslie Maranciak - leslie.maranciak@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NEWCASTLE email address.

CHAIN OF CUSTODY RECORD

Page 1 of 2

CLIENT DETAILS		Contact Name: Lachlan Parkinson		Purchase Order: 12584780		COC Number:	
Company Name: GHD		Project Manager: Leslie Maranciak		PROJECT Number: 12584780		Eurofins | mgt quote ID: 180501GHD	
Office Address: L3, 24 Honeysuckle Drive Newcastle 2300		Email for results: Leslie.Maranciak@ghd.com Lachlan.Parkinson@ghd.com		PROJECT Name: Aurizon Hexham Water Monitoring		Data output format: ESDAT	

Special Directions & Comments:
 Please ensure fecal coliforms are reported in CFU/100ml

Eurofins | mgt OI water batch number:

Sample ID	Date	Matrix	B4 (BTEXN / TRH / PAH)	Dissolved Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	Sulphate BISA (Nutrients, Total N (TKN), NOX), Total P	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day	Analytes
1			X	X	X	X	X	X	X	
2	7/11/22	W	X	X	X	X	X	X	X	
3			X	X	X	X	X	X	X	
4	7/12/22	W	X	X	X	X	X	X	X	
5			X	X	X	X	X	X	X	
6	7/12/22	W	X	X	X	X	X	X	X	
7	7/12/22	W	X	X	X	X	X	X	X	
8			X	X	X	X	X	X	X	
9			X	X	X	X	X	X	X	
10			X	X	X	X	X	X	X	
11	7/12/22	W	X	X	X	X	X	X	X	
12	7/12/22	W	X	X			X			X
13	7/12/22	W								
14										
15										
16										
17										

Send to ALS - same analysis as FD01 at ALS please

Some common holding times (with correct preservation). For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar
-----	------	------	-----	-----------	---------	-----

Sample comments:

Send to ALS for Same Analysis as FD01

Relinquished By: <i>C. Parkinson</i>	Received By: <i>Saiden Stowman</i>	Turn around time: 1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/> 6 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other: _____	Method Of Shipment: <input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Parcel	Temperature on arrival: <i>6.5</i>
Date & Time: <i>7/12/22</i>	Date & Time: <i>2:04 7/12/22</i>	Courier Consignment #:		Report number:
Signature: <i>7/12/22</i>	Signature: <i>[Signature]</i>			

H1978325
014 8/12/22
OH
5/12/22

COPY

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name: GHD	Contact Name: Lachlan Parkinson	Purchase Order: 12584780	Page 1 of 2
Office Address: L3, 24 Honeysuckle Drive Newcastle 2300	Project Manager: Leslie Maranciak Email for results: Leslie.Maranciak@ghd.com Lachlan.Parkinson@ghd.com	PROJECT Number: 12584780 PROJECT Name: Aurizon Hexham Water Monitoring	COC Number: Eurofins | mgt quote ID: 180501GHD Data output format: ESDAT

Special Directions & Comments:

Please ensure fecal coliforms are reported in CFU/100ml

Analytes

Some common holding times (with correct preservation). For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Eurofins | mgt O1 water batch number:

Sample ID	Date	Matrix	B4 (BTEXN / TRH / PAH)	Dissolved Metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn)	pH, Conductivity, Turbidity, Suspended Solids	Ammonia	Suite B19A (Nutrients, Total N (TKN), NOX), Total P	Thermotolerant Coliforms (CFU/100ml)	BOD 5 Day	Send to ALS - same analysis as FD01 at ALS please	Containers:	Sample comments:
101R	7/12/22	W	X	X	X	X	X	X	X		1LP, 250P, 125P, 1LA, 40mL vial, 125mL A, Jar	
NW106R	7/12/22	W	X	X	X	X	X	X	X			
NW109	7/12/22	W	X	X	X	X	X	X	X			
NW301R	7/12/22	W	X	X	X	X	X	X	X			
NW302R	7/12/22	W	X	X	X	X	X	X	X			
FD01	7/12/22	W	X	X			X					
FD02	7/12/22	W								X		Send to ALS for Same Analysis as FD01

Relinquished By: <i>C. Parkinson</i>	Laboratory Staff	Turn around time	Method Of Shipment	Temperature on arrival: 6.5
Date & Time: <i>7/12/22</i>	Received By: <i>Jaiden Slowman</i>	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>	<input checked="" type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal	Report number:
Signature: <i>7/12/22</i>	Date & Time: <i>2:04 7/12/22</i>	5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:	Courier Consignment #:	

OK in 5/12/22

#AU_CAU001_EnviroSampleVic

From: Andrew Black
Sent: Friday, 9 December 2022 2:11 PM
To: #AU_CAU001_EnviroSampleVic
Subject: FW: Eurofins Sample Receipt Advice - Report 948325 : Site AURIZON HEXHAM WATER MONITORING (12584780)

Follow Up Flag: Follow up
Flag Status: Flagged

INFO: INTERNAL EMAIL - Sent from your own Eurofins email domain.

Edits to make to this one as per client request below thanks guys

Andrew Black
Analytical Services Manager

Eurofins | Environment Testing Australia Pty Ltd

Phone: +61 2 9900 8490

Mobile: +61 410 220 750

Email: AndrewBlack@eurofins.com

Website: eurofins.com.au/environmental-testing



PLEASE NOTE: As of the 19th of December, please ensure all samples are delivered to our new site at: **Building 1 / 2 Frost Drive, Mayfield West.**



This e-mail including its attachments may contain confidential and proprietary information. Any unauthorized disclosure or use of this e-mail including its attachments is prohibited and may be prosecuted. If you are not the intended recipient, please inform the sender by an e-mail reply and delete the message.

Transmission by e-mail is not secure and can result in errors or omissions in the content of the message. Despite state-of-the-art precautions we cannot guarantee that e-mails and attachments are free from viruses. We accept no liability for viruses or any transmission-related errors and omissions. You need to always virus-check any e-mails and attachments.

Eurofins companies are independent legal entities that are bound only by members of their management bodies. No other persons have representation power unless specifically authorised by proxy or other legal means.

For sample receipt enquiries (eg. SRAs, changes to analysis) please contact EnvirosampleNSW@eurofins.com or 02 9900 8421 (7am – 9pm).

For despatch enquiries (eg. courier bookings, bottle orders) please contact AU04_Despatch_SYD@eurofins.com or 0488 400 929 (8am – 4pm).

From: Leslie Maranciak <Leslie.Maranciak@ghd.com>

Sent: Friday, 9 December 2022 1:35 PM

To: Andrew Black <AndrewBlack@eurofins.com>

Subject: RE: Eurofins Sample Receipt Advice - Report 948325 : Site AURIZON HEXHAM WATER MONITORING (12584780)

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Andrew-

Sorry about that! We had a lot of sample locations that were dry this round so he had to cut out a lot on our pre-populated COC.

The changes I note are-

-SW9 (M22-De0017903) should be analysed for Total Metals not Dissolved

-FD02 (M22-De0017906) should be sent to ALS and analysis should be the same as location FD01 (believe have already received SRN for this from them)

Also what is the hold time if we want to potentially run FB01 for same analytes as RB01?

Thanks,
Leslie

From: AndrewBlack@eurofins.com <AndrewBlack@eurofins.com>

Sent: Friday, 9 December 2022 10:40 AM

To: Leslie Maranciak <leslie.maranciak@ghd.com>

Subject: Eurofins Sample Receipt Advice - Report 948325 : Site AURIZON HEXHAM WATER MONITORING (12584780)

Hi Leslie

Since this COC is a little messy can you double check that the login all looks good for you guys please?

Kindest Regards,

Andrew Black
Analytical Services Manager

Eurofins | Environment Testing

Unit 7

7 Friesian Close

SANDGATE NSW 2304

AUSTRALIA

Phone: +61 299 008 490

Mobile: +61 410 220 750

Email: AndrewBlack@eurofins.com

Website: environment.eurofins.com.au

[View our latest EnviroNotes](#)

[How did we do? Provide your feedback here](#)



CONFIDENTIALITY NOTICE: This email, including any attachments, is confidential and may be privileged. If you are not the intended recipient please notify the sender immediately, and please delete it; you should not copy it or use it for any purpose or disclose its contents to any other person. GHD and its affiliates reserve the right to monitor and modify all email communications through their networks.

#AU_CAU001_EnviroSampleVic

From: Leslie Maranciak <Leslie.Maranciak@ghd.com>
Sent: Wednesday, 14 December 2022 8:16 AM
To: #AU_CAU001_EnviroSampleVic
Cc: Lachlan Parkinson
Subject: RE: Eurofins Sample Receipt Advice - Report 948325 : Site AURIZON HEXHAM WATER MONITORING (12584780)

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi-
For Basin 1 please analyse for Total metals, not dissolved.

Thank you,
Leslie

From: EnviroSampleVic@eurofins.com <EnviroSampleVic@eurofins.com>
Sent: Tuesday, 13 December 2022 5:56 PM
To: Leslie Maranciak <leslie.maranciak@ghd.com>
Subject: Eurofins Sample Receipt Advice - Report 948325 : Site AURIZON HEXHAM WATER MONITORING (12584780)

Dear Valued Client,

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Tyrone Gowans
Sample Receipt

Eurofins Environment Testing
6 Monterey Road Dandenong South VIC 3175
AUSTRALIA
Phone: 03 8564 5043
Email: Envirosamplevic@eurofins.com
Website: environment.eurofins.com.au

[View our latest EnviroNotes](#)
[How did we do? Provide your feedback here](#)

ANALYTICAL REPORT

REPORT CODE
AR-22-NV-016636-01
REPORT DATE
10/12/2022

Eurofins Environment Testing Australia Pty Ltd

For the attention of **Analytical Reports**
 6 Monterey Road
 Dandenong South
 3175 Melbourne
 AUSTRALIA


Phone
Email EnviroReportsau@eurofins.com

Contact for your orders: Ruvini Herath
Submission Reference: Merged from order
 cau001-order-948341-221209.xml

Order code: EUAUTWU-00026041
Purchase Order Number: 948341

SAMPLE CODE 726-2022-00044815

Client Reference: 22-De0018035
Sample described as: MW01R
Reception Date: 09/12/2022
Analysis Starting Date: 09/12/2022
Sampled Date & Time: 08/12/2022 12:00:00

Reception temperature: 5.4 °C
Analysis Ending Date: 10/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 9/12/2022 16:00

Thermotolerant coliforms	<1	cfu/10 ml		1
--------------------------	----	-----------	--	---

SAMPLE CODE 726-2022-00044816

Client Reference: 22-De0018036
Sample described as: MW02
Reception Date: 09/12/2022
Analysis Starting Date: 09/12/2022
Sampled Date & Time: 08/12/2022 12:00:00

Reception temperature: 5.4 °C
Analysis Ending Date: 10/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 9/12/2022 16:00

Thermotolerant coliforms	<1	cfu/10 ml		1
--------------------------	----	-----------	--	---

SAMPLE CODE 726-2022-00044817

Client Reference: 22-De0018037
Sample described as: MW308R
Reception Date: 09/12/2022
Analysis Starting Date: 09/12/2022
Sampled Date & Time: 08/12/2022 12:00:00

Reception temperature: 5.4 °C
Analysis Ending Date: 10/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 9/12/2022 16:00

Thermotolerant coliforms	<1	cfu/10 ml		1
--------------------------	----	-----------	--	---

Eurofins Food Testing Australia Pty Ltd

 6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

https://www.eurofins.com.au/food-testing

Accredited for compliance with ISO/IEC 17025 - Testing
 NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
 Accreditation Number 20293



SAMPLE CODE 726-2022-00044818

Client Reference: 22-De0018038
Sample described as: MW307R
Reception Date: 09/12/2022
Analysis Starting Date: 09/12/2022
Sampled Date & Time: 08/12/2022 12:00:00

Reception temperature: 5.4 °C
Analysis Ending Date: 10/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 9/12/2022 16:00

Thermotolerant coliforms	<1	cfu/10 ml	1
--------------------------	----	-----------	---

SAMPLE CODE 726-2022-00044819

Client Reference: 22-De0018039
Sample described as: MW108R
Reception Date: 09/12/2022
Analysis Starting Date: 09/12/2022
Sampled Date & Time: 08/12/2022 12:00:00

Reception temperature: 5.4 °C
Analysis Ending Date: 10/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 9/12/2022 16:00

Thermotolerant coliforms	1	cfu/10 ml	1
--------------------------	---	-----------	---

SAMPLE CODE 726-2022-00044820

Client Reference: 22-De0018040
Sample described as: MW101R
Reception Date: 09/12/2022
Analysis Starting Date: 09/12/2022
Sampled Date & Time: 08/12/2022 12:00:00

Reception temperature: 5.4 °C
Analysis Ending Date: 10/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 9/12/2022 16:00

Thermotolerant coliforms	<1	cfu/10 ml	1
--------------------------	----	-----------	---

SAMPLE CODE 726-2022-00044821

Client Reference: 22-De0018041
Sample described as: BASIN 3
Reception Date: 09/12/2022
Analysis Starting Date: 09/12/2022
Sampled Date & Time: 08/12/2022 12:00:00

Reception temperature: 5.4 °C
Analysis Ending Date: 10/12/2022

RESULTS
LOQ
VQ792 Thermotolerant Coliforms

Analysis Starting Date: 9/12/2022 16:00

Thermotolerant coliforms	27	cfu/ml	1
--------------------------	----	--------	---

LIST OF METHODS

VQ792 Thermotolerant Coliforms: AS 4276.7

Eurofins Food Testing Australia Pty Ltd

6 Monterey Road
 Dandenong South
 Melbourne
 VIC 3175
 AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/food-testing>

Accredited for compliance with ISO/IEC 17025 - Testing
 NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.
 Accreditation Number 20293



Signature



Deepika Rajwar Analyst

EXPLANATORY NOTE

- ◆ Test is not accredited
- Test is subcontracted within Eurofins group and is accredited
- Test is subcontracted within Eurofins group and is not accredited
- Test is subcontracted outside Eurofins group and is accredited
- Test is subcontracted outside Eurofins group and is not accredited

N/A means Not applicable**Not Detected** means not detected at or above the Limit of Quantification (LOQ)

LOQ Limit of Quantification

U Measurement Uncertainty

< Less than, ≤ Less than or equal to

> Greater than, ≥ Greater than or equal to

The tests are identified by a 5 digit code, full details can be provided on request.

Information supplied by the client. This information can have an impact on the validity of results.

Samples are tested as received and the results relate only to the sample tested.

Analysis date is reported as the start date of extraction for a method.

The results may not be reproduced except in full, without a written approval from the laboratory.

Eurofins General Terms and Conditions apply.

END OF REPORT**Eurofins Food Testing Australia Pty Ltd**

6 Monterey Road
Dandenong South
Melbourne
VIC 3175
AUSTRALIA

Phone +61385645000

<https://www.eurofins.com.au/food-testing>Accredited for compliance with ISO/IEC
17025 - TestingNATA is a signatory to the ILAC Mutual
Recognition Arrangement for the mutual
recognition of the equivalence of testing,
medical testing, calibration, inspection,
proficiency testing scheme providers and
reference materials producers reports and
certificates.

Accreditation Number 20293



GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **Lachlan Parkinson**

Report **948341-W**
Project name **AURIZON HEXHAM WATER MONITORING**
Project ID **12584780**
Received Date **Dec 08, 2022**

Client Sample ID			MW01R	MW02	MW308R	MW307R
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			N22- De0018035	N22- De0018036	N22- De0018037	N22- De0018038
Date Sampled			Dec 08, 2022	Dec 08, 2022	Dec 08, 2022	Dec 08, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	94	95	92	94
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			MW01R	MW02	MW308R	MW307R
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			N22-De0018035	N22-De0018036	N22-De0018037	N22-De0018038
Date Sampled			Dec 08, 2022	Dec 08, 2022	Dec 08, 2022	Dec 08, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	96	102	105	83
p-Terphenyl-d14 (surr.)	1	%	52	56	100	123
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	^{R09} 2.0	^{R09} 1.7	1.4	^{R09} 32
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	< 5	< 5	5.1
Conductivity (at 25 °C)						
Conductivity (at 25 °C)	10	uS/cm	25000	1800	5400	33000
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	0.09	< 0.05	0.28	< 0.5
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	7.4	6.8	7.3	8.2
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.91	0.44	0.19	8.5
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	< 0.2	1.3	1.9	29
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	< 0.2	1.3	2.18	29
Total Suspended Solids Dried at 103 °C to 105 °C						
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	320	40	170	50
Turbidity						
Turbidity	1	NTU	130	63	300	14
Heavy Metals						
Aluminium (filtered)						
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)						
Arsenic (filtered)	0.001	mg/L	0.003	0.014	0.009	< 0.001
Cadmium (filtered)						
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)						
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.001
Copper (filtered)						
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Iron (filtered)						
Iron (filtered)	0.05	mg/L	12	82	55	0.08
Lead (filtered)						
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)						
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)						
Nickel (filtered)	0.001	mg/L	0.012	0.061	0.017	< 0.001
Zinc (filtered)						
Zinc (filtered)	0.005	mg/L	0.012	0.087	< 0.005	< 0.005
Pathogens						
Thermotolerant Coliforms (CFU)						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	see attached

Client Sample ID			MW108R	MW101R	BASIN 3	RB02
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			N22-De0018039	N22-De0018040	N22-De0018041	N22-De0018042
Date Sampled			Dec 08, 2022	Dec 08, 2022	Dec 08, 2022	Dec 08, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			MW108R	MW101R	BASIN 3	RB02
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			N22-De0018039	N22-De0018040	N22-De0018041	N22-De0018042
Date Sampled			Dec 08, 2022	Dec 08, 2022	Dec 08, 2022	Dec 08, 2022
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	94	100	104	102
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	82	106	105	102
p-Terphenyl-d14 (surr.)	1	%	130	63	67	98
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia (as N)						
Ammonia (as N)	0.01	mg/L	0.08	0.90	1.8	-
Biochemical Oxygen Demand (BOD-5 Day)						
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	< 5	< 5	-
Conductivity (at 25 °C)						
Conductivity (at 25 °C)	10	uS/cm	3100	5700	2300	-
Nitrate & Nitrite (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.25	< 0.05	< 0.05
pH (at 25 °C)						
pH (at 25 °C)	0.1	pH Units	7.8	6.8	7.9	-
Phosphate total (as P)						
Phosphate total (as P)	0.01	mg/L	0.05	0.05	0.33	0.01
Total Kjeldahl Nitrogen (as N)						
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	0.3	1.1	2.5	< 0.2
Total Nitrogen (as N)*						
Total Nitrogen (as N)*	0.2	mg/L	0.3	1.1	2.5	< 0.2
Total Suspended Solids Dried at 103 °C to 105 °C						
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	82	190	14	-
Turbidity						
Turbidity	1	NTU	59	480	6.7	-

Client Sample ID			MW108R	MW101R	BASIN 3	RB02
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			N22-De0018039	N22-De0018040	N22-De0018041	N22-De0018042
Date Sampled			Dec 08, 2022	Dec 08, 2022	Dec 08, 2022	Dec 08, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	-	-	< 0.05	< 0.05
Aluminium (filtered)	0.05	mg/L	< 0.05	0.05	-	-
Arsenic	0.001	mg/L	-	-	< 0.001	< 0.001
Arsenic (filtered)	0.001	mg/L	< 0.001	0.002	-	-
Cadmium	0.0002	mg/L	-	-	< 0.0002	< 0.0002
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	-	-
Chromium	0.001	mg/L	-	-	< 0.001	< 0.001
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	-	-
Copper	0.001	mg/L	-	-	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001	-	-
Iron	0.05	mg/L	-	-	0.33	< 0.05
Iron (filtered)	0.05	mg/L	0.68	180	-	-
Lead	0.001	mg/L	-	-	< 0.001	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	-	-
Mercury	0.0001	mg/L	-	-	< 0.0001	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Nickel	0.001	mg/L	-	-	0.004	< 0.001
Nickel (filtered)	0.001	mg/L	0.005	0.066	-	-
Zinc	0.005	mg/L	-	-	< 0.005	< 0.005
Zinc (filtered)	0.005	mg/L	0.034	0.022	-	-
Pathogens						
Thermotolerant Coliforms (CFU)	1	CFU/100mL	see attached	see attached	see attached	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Dec 12, 2022	7 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Melbourne	Dec 12, 2022	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Dec 12, 2022	7 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Dec 12, 2022	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Dec 12, 2022	7 Days
Ammonia (as N) - Method: APHA 4500-NH3 Ammonia Nitrogen by FIA	Melbourne	Dec 12, 2022	28 Days
Biochemical Oxygen Demand (BOD-5 Day) - Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water	Melbourne	Dec 12, 2022	2 Days
Conductivity (at 25 °C) - Method: LTM-INO-4030 Conductivity	Melbourne	Dec 12, 2022	28 Days
pH (at 25 °C) - Method: LTM-GEN-7090 pH in water by ISE	Melbourne	Dec 12, 2022	0 Hours
Total Suspended Solids Dried at 103 °C to 105 °C - Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry	Melbourne	Dec 12, 2022	7 Days
Turbidity - Method: Turbidity by classical using APHA 2130B (LTM-INO-4140)	Melbourne	Dec 12, 2022	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Dec 12, 2022	28 Days
Heavy Metals (filtered) - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Dec 12, 2022	180 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Dec 12, 2022	28 Days
Metals M8 filtered - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Dec 12, 2022	28 Days
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N) - Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA	Melbourne	Dec 12, 2022	28 Days
Total Kjeldahl Nitrogen (as N) - Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA	Melbourne	Dec 12, 2022	28 Days
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphate total (as P) - Method: LTM-INO-4040 Phosphate by CFA	Melbourne	Dec 12, 2022	28 Days

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.: 12584780
Report #: 948341
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Dec 8, 2022 12:25 PM
Due: Dec 15, 2022
Priority: 5 Day
Contact Name: Lachlan Parkinson

Project Name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium	Aluminium (filtered)	Ammonia (as N)	Biochemical Oxygen Demand (BOD-5 Day)	Conductivity (at 25 °C)	Iron	Iron (filtered)	pH (at 25 °C)	Thermotolerant Coliforms (CFU)	Total Suspended Solids Dried at 103 °C to 105 °C	Turbidity	Metals M8	Metals M8 filtered	Eurofins Suite B4	Eurofins Suite B19A: Total N (TKN, NO _x), Total P
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X		X	X	X	X	X	X
External Laboratory														X						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID															
1	MW01R	Dec 08, 2022		Water	N22-De0018035		X	X	X	X		X	X	X	X	X		X	X	X
2	MW02	Dec 08, 2022		Water	N22-De0018036		X	X	X	X		X	X	X	X	X		X	X	X
3	MW308R	Dec 08, 2022		Water	N22-De0018037		X	X	X	X		X	X	X	X	X		X	X	X
4	MW307R	Dec 08, 2022		Water	N22-De0018038		X	X	X	X		X	X	X	X	X		X	X	X
5	MW108R	Dec 08, 2022		Water	N22-De0018039		X	X	X	X		X	X	X	X	X		X	X	X
6	MW101R	Dec 08, 2022		Water	N22-De0018040		X	X	X	X		X	X	X	X	X		X	X	X
7	BASIN 3	Dec 08, 2022		Water	N22-De0018041	X		X	X	X	X		X	X	X	X	X		X	X
8	RB02	Dec 08, 2022		Water	N22-De0018042	X					X						X		X	X
Test Counts						2	6	7	7	7	2	6	7	7	7	7	2	6	8	8

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPa, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Phosphate total (as P)	mg/L	< 0.01			0.01	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	mg/L	< 5			5	Pass	
Turbidity	NTU	< 1			1	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/L	< 0.05			0.05	Pass	
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Arsenic	mg/L	< 0.001		0.001	Pass	
Arsenic (filtered)	mg/L	< 0.001		0.001	Pass	
Cadmium	mg/L	< 0.0002		0.0002	Pass	
Cadmium (filtered)	mg/L	< 0.0002		0.0002	Pass	
Chromium	mg/L	< 0.001		0.001	Pass	
Chromium (filtered)	mg/L	< 0.001		0.001	Pass	
Copper	mg/L	< 0.001		0.001	Pass	
Copper (filtered)	mg/L	< 0.001		0.001	Pass	
Iron	mg/L	< 0.05		0.05	Pass	
Iron (filtered)	mg/L	< 0.05		0.05	Pass	
Lead	mg/L	< 0.001		0.001	Pass	
Lead (filtered)	mg/L	< 0.001		0.001	Pass	
Mercury	mg/L	< 0.0001		0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001		0.0001	Pass	
Nickel	mg/L	< 0.001		0.001	Pass	
Nickel (filtered)	mg/L	< 0.001		0.001	Pass	
Zinc	mg/L	< 0.005		0.005	Pass	
Zinc (filtered)	mg/L	< 0.005		0.005	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	%	116		70-130	Pass	
TRH C10-C14	%	113		70-130	Pass	
LCS - % Recovery						
BTEX						
Benzene	%	113		70-130	Pass	
Toluene	%	107		70-130	Pass	
Ethylbenzene	%	102		70-130	Pass	
m&p-Xylenes	%	103		70-130	Pass	
Xylenes - Total*	%	103		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene	%	79		70-130	Pass	
TRH C6-C10	%	116		70-130	Pass	
LCS - % Recovery						
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	%	119		70-130	Pass	
Acenaphthylene	%	114		70-130	Pass	
Anthracene	%	97		70-130	Pass	
Benz(a)anthracene	%	108		70-130	Pass	
Benzo(a)pyrene	%	88		70-130	Pass	
Benzo(b&j)fluoranthene	%	127		70-130	Pass	
Benzo(g,h,i)perylene	%	114		70-130	Pass	
Benzo(k)fluoranthene	%	114		70-130	Pass	
Chrysene	%	100		70-130	Pass	
Dibenz(a,h)anthracene	%	94		70-130	Pass	
Fluoranthene	%	93		70-130	Pass	
Fluorene	%	108		70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	97		70-130	Pass	
Naphthalene	%	71		70-130	Pass	
Phenanthrene	%	98		70-130	Pass	
Pyrene	%	94		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	%	116		70-130	Pass	
LCS - % Recovery						

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
Ammonia (as N)	%	104			70-130	Pass		
Conductivity (at 25 °C)	%	98			70-130	Pass		
Nitrate & Nitrite (as N)	%	102			70-130	Pass		
Phosphate total (as P)	%	102			70-130	Pass		
Total Kjeldahl Nitrogen (as N)	%	94			70-130	Pass		
Total Suspended Solids Dried at 103 °C to 105 °C	%	96			70-130	Pass		
LCS - % Recovery								
Heavy Metals								
Aluminium	%	98			80-120	Pass		
Aluminium (filtered)	%	103			80-120	Pass		
Arsenic	%	97			80-120	Pass		
Arsenic (filtered)	%	97			80-120	Pass		
Cadmium	%	97			80-120	Pass		
Cadmium (filtered)	%	98			80-120	Pass		
Chromium	%	99			80-120	Pass		
Chromium (filtered)	%	99			80-120	Pass		
Copper	%	97			80-120	Pass		
Copper (filtered)	%	98			80-120	Pass		
Iron	%	100			80-120	Pass		
Iron (filtered)	%	103			80-120	Pass		
Lead	%	99			80-120	Pass		
Lead (filtered)	%	101			80-120	Pass		
Mercury	%	95			80-120	Pass		
Mercury (filtered)	%	88			80-120	Pass		
Nickel	%	97			80-120	Pass		
Nickel (filtered)	%	101			80-120	Pass		
Zinc	%	98			80-120	Pass		
Zinc (filtered)	%	98			80-120	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C6-C9	M22-De0030247	NCP	%	124		70-130	Pass	
TRH C10-C14	M22-De0029054	NCP	%	116		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	M22-De0030247	NCP	%	99		70-130	Pass	
Toluene	M22-De0030247	NCP	%	101		70-130	Pass	
Ethylbenzene	M22-De0030247	NCP	%	96		70-130	Pass	
m&p-Xylenes	M22-De0030247	NCP	%	94		70-130	Pass	
o-Xylene	M22-De0030247	NCP	%	95		70-130	Pass	
Xylenes - Total*	M22-De0030247	NCP	%	94		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	M22-De0030247	NCP	%	75		70-130	Pass	
TRH C6-C10	M22-De0030247	NCP	%	124		70-130	Pass	
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	M22-De0029089	NCP	%	110		70-130	Pass	
Acenaphthylene	M22-De0029089	NCP	%	108		70-130	Pass	
Anthracene	M22-De0029089	NCP	%	99		70-130	Pass	
Benz(a)anthracene	M22-De0029089	NCP	%	102		70-130	Pass	
Benzo(a)pyrene	M22-De0029089	NCP	%	113		70-130	Pass	
Benzo(b&j)fluoranthene	M22-De0029089	NCP	%	103		70-130	Pass	
Benzo(g,h,i)perylene	M22-De0029089	NCP	%	121		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(k)fluoranthene	M22-De0029089	NCP	%	122			70-130	Pass	
Chrysene	M22-De0029089	NCP	%	121			70-130	Pass	
Dibenz(a,h)anthracene	M22-De0029089	NCP	%	73			70-130	Pass	
Fluoranthene	M22-De0029089	NCP	%	100			70-130	Pass	
Fluorene	M22-De0029089	NCP	%	107			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M22-De0029089	NCP	%	76			70-130	Pass	
Naphthalene	M22-De0029089	NCP	%	78			70-130	Pass	
Phenanthrene	M22-De0029089	NCP	%	101			70-130	Pass	
Pyrene	M22-De0029089	NCP	%	100			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M22-De0029054	NCP	%	119			70-130	Pass	
Spike - % Recovery									
				Result 1					
Ammonia (as N)	M22-De0026688	NCP	%	121			70-130	Pass	
Nitrate & Nitrite (as N)	M22-De0026688	NCP	%	74			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	B22-De0017260	NCP	%	78			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium (filtered)	N22-De0020943	NCP	%	99			75-125	Pass	
Arsenic (filtered)	N22-De0020943	NCP	%	96			75-125	Pass	
Cadmium (filtered)	M22-De0026313	NCP	%	92			75-125	Pass	
Chromium (filtered)	N22-De0020943	NCP	%	99			75-125	Pass	
Copper (filtered)	N22-De0020943	NCP	%	96			75-125	Pass	
Iron (filtered)	M22-De0026313	NCP	%	98			75-125	Pass	
Lead (filtered)	N22-De0020943	NCP	%	99			75-125	Pass	
Mercury (filtered)	M22-De0026313	NCP	%	84			75-125	Pass	
Nickel (filtered)	N22-De0020943	NCP	%	94			75-125	Pass	
Zinc (filtered)	N22-De0020943	NCP	%	96			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	M22-De0022359	NCP	%	111			75-125	Pass	
Arsenic	M22-De0022359	NCP	%	106			75-125	Pass	
Cadmium	M22-De0022359	NCP	%	106			75-125	Pass	
Chromium	M22-De0022359	NCP	%	111			75-125	Pass	
Copper	M22-De0022359	NCP	%	107			75-125	Pass	
Iron	M22-De0022359	NCP	%	95			75-125	Pass	
Lead	M22-De0022359	NCP	%	108			75-125	Pass	
Mercury	M22-De0022359	NCP	%	103			75-125	Pass	
Nickel	M22-De0022359	NCP	%	106			75-125	Pass	
Zinc	M22-De0022359	NCP	%	106			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M22-De0029653	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M22-De0028396	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M22-De0028396	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M22-De0028396	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M22-De0029653	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M22-De0029653	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M22-De0029653	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M22-De0029653	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	

Duplicate								
BTEX				Result 1	Result 2	RPD		
o-Xylene	M22-De0029653	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Xylenes - Total*	M22-De0029653	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	M22-De0029653	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass
TRH C6-C10	M22-De0029653	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Acenaphthylene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Anthracene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benz(a)anthracene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(a)pyrene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(b&j)fluoranthene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(g,h,i)perylene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(k)fluoranthene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Chrysene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Dibenz(a,h)anthracene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluoranthene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluorene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Naphthalene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Phenanthrene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Pyrene	M22-De0029088	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
TRH >C10-C16	M22-De0028396	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass
TRH >C16-C34	M22-De0028396	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass
TRH >C34-C40	M22-De0028396	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Phosphate total (as P)	B22-De0017798	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass
Total Kjeldahl Nitrogen (as N)	M22-De0026683	NCP	mg/L	2.1	2.1	3.8	30%	Pass
Turbidity	M22-De0025660	NCP	NTU	1.5	1.4	7.7	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium (filtered)	N22-De0020943	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Arsenic (filtered)	N22-De0020943	NCP	mg/L	0.056	0.055	2.4	30%	Pass
Cadmium (filtered)	M22-De0026313	NCP	mg/L	0.0008	0.0009	9.2	30%	Pass
Chromium (filtered)	N22-De0020943	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper (filtered)	N22-De0020943	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Iron (filtered)	N22-De0020943	NCP	mg/L	8.1	8.1	<1	30%	Pass
Lead (filtered)	N22-De0020943	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury (filtered)	M22-De0026313	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel (filtered)	N22-De0020943	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Zinc (filtered)	N22-De0020943	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Biochemical Oxygen Demand (BOD-5 Day)	N22-De0018036	CP	mg/L	< 5	< 5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Ammonia (as N)	N22-De0018041	CP	mg/L	1.8	1.8	<1	30%	Pass
Nitrate & Nitrite (as N)	N22-De0018041	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium	M22-De0022359	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Arsenic	M22-De0022359	NCP	mg/L	0.001	0.001	2.9	30%	Pass
Cadmium	M22-De0022359	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium	M22-De0022359	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper	M22-De0022359	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Iron	M22-De0022359	NCP	mg/L	1.7	1.7	<1	30%	Pass
Lead	M22-De0022359	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury	M22-De0022359	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	M22-De0022359	NCP	mg/L	0.002	0.002	5.0	30%	Pass
Zinc	M22-De0022359	NCP	mg/L	0.012	0.009	22	30%	Pass

Comments

Thermotolerant coliforms analysed by; Eurofins Food Testing; accreditation number 20293; report reference AR-22-NV-016636-01

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
R09	Theoretically the TKN result should be greater or equal to the ammonia concentration. However the difference reported is within the measurement uncertainty of the individual tests

Authorised by:

Bonnie Pu	Analytical Services Manager
Edward Lee	Senior Analyst-Organic
Joseph Edouard	Senior Analyst-Volatile
Mary Makarios	Senior Analyst-Inorganic
Mele Singh	Senior Analyst-Volatile
Scott Beddoes	Senior Analyst-Inorganic
Scott Beddoes	Senior Analyst-Metal



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne 6 Monterey Road Dandenong South VIC 3175 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Geelong 19/8 Lewalan Street Grovedale VIC 3216 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Sydney 179 Magowar Road Girraween NSW 2145 Tel: +61 2 9900 8400 NATA# 1261 Site# 18217
---	---	--

Canberra Unit 1,2 Dacre Street Mitchell ACT 2911 Tel: +61 2 6113 8091	Brisbane 1/21 Smallwood Place Murarie QLD 4172 Tel: +61 7 3902 4600 NATA# 1261 Site# 20794	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Tel: +61 2 4968 8448 NATA# 1261 Site# 25079
--	--	---

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland 35 O'Rorke Road Penrose, Auckland 1061 Tel: +64 9 526 45 51 IANZ# 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Tel: 0800 856 450 IANZ# 1290
---	---

Sample Receipt Advice

Company name: GHD Pty Ltd NEWCASTLE
Contact name: Lachlan Parkinson
Project name: AURIZON HEXHAM WATER MONITORING
Project ID: 12584780
Turnaround time: 5 Day
Date/Time received: Dec 8, 2022 12:25 PM
Eurofins reference: 948341

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 8.7 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✓ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Lachlan Parkinson - lachlan.parkinson@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NEWCASTLE email address.

CERTIFICATE OF ANALYSIS

Work Order : **EM2224491**
Client : **GHD PTY LTD**
Contact : Leslie Maranciak
Address : LEVEL 15, 133 CASTLEREAGH STREET
 SYDNEY NSW, AUSTRALIA 2000

Telephone : ----
Project : 12584780
Order number : 12584780
C-O-C number : ----
Sampler : ----
Site :
Quote number : EN/005
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 6
Laboratory : Environmental Division Melbourne
Contact : Peter Ravlic
Address : 4 Westall Rd Springvale VIC Australia 3171

Telephone : +6138549 9645
Date Samples Received : 09-Dec-2022 10:40
Date Analysis Commenced : 09-Dec-2022
Issue Date : 16-Dec-2022 17:19



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	FD02	----	----	----	----
Sampling date / time			07-Dec-2022 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	EM2224491-001	-----	-----	-----	-----
				Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.01	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	0.003	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.010	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	0.069	----	----	----	----
Iron	7439-89-6	0.05	mg/L	54.3	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.8	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	1.8	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.42	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FD02	----	----	----	----
Sampling date / time				07-Dec-2022 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	EM2224491-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----	
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----	
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----	
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----	
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----	
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----	
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----	
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----	
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	----	----	----	----	
Toluene	108-88-3	2	µg/L	<2	----	----	----	----	
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----	
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----	
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----	
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----	
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%	18.0	----	----	----	----	
2-Chlorophenol-D4	93951-73-6	1.0	%	59.0	----	----	----	----	
2,4,6-Tribromophenol	118-79-6	1.0	%	113	----	----	----	----	
EP075(SIM)T: PAH Surrogates									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FD02	----	----	----	----
Sampling date / time				07-Dec-2022 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	EM2224491-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP075(SIM)T: PAH Surrogates - Continued									
2-Fluorobiphenyl	321-60-8	1.0	%	78.4	----	----	----	----	
Anthracene-d10	1719-06-8	1.0	%	94.6	----	----	----	----	
4-Terphenyl-d14	1718-51-0	1.0	%	100	----	----	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%	90.0	----	----	----	----	
Toluene-D8	2037-26-5	2	%	130	----	----	----	----	
4-Bromofluorobenzene	460-00-4	2	%	132	----	----	----	----	



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	51
2-Chlorophenol-D4	93951-73-6	30	114
2,4,6-Tribromophenol	118-79-6	26	133
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	35	127
Anthracene-d10	1719-06-8	44	122
4-Terphenyl-d14	1718-51-0	44	124
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

QUALITY CONTROL REPORT

Work Order	: EM2224491	Page	: 1 of 6
Client	: GHD PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: Leslie Maranciak	Contact	: Peter Ravlic
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12584780	Date Samples Received	: 09-Dec-2022
Order number	: 12584780	Date Analysis Commenced	: 09-Dec-2022
C-O-C number	: ----	Issue Date	: 16-Dec-2022
Sampler	: ----		
Site	:		
Quote number	: EN/005		
No. of samples received	: 1		
No. of samples analysed	: 1		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4763244)									
EM2224491-001	FD02	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.010	0.010	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.069	0.068	2.0	0% - 50%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.01	<0.01	0.0	No Limit
EM2224549-008	Anonymous	EG020A-F: Iron	7439-89-6	0.05	mg/L	54.3	53.4	1.7	0% - 20%
		EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.008	0.008	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.076	0.073	3.5	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.007	0.006	0.0	No Limit
EM2224549-003	Anonymous	EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 4763241)									
EM2224549-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2224371-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4761383)									
EM2224439-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2224371-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	7.15	7.16	0.2	0% - 20%

Page : 3 of 6
 Work Order : EM2224491
 Client : GHD PTY LTD
 Project : 12584780



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4763876)									
EM2224515-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.1	63.7	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4763875)									
EM2224515-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.17	0.21	17.4	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4758532)									
EM2224474-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM2224474-012	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4758532)									
EM2224474-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EM2224474-012	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 4758532)									
EM2224474-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EM2224474-012	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
EG020F: Dissolved Metals by ICP-MS (QCLot: 4763244)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	98.8	90.4	111
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	105	89.0	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	105	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.2	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	100	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.5	84.6	108
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	84.3	110
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	110	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	101	91.8	112
EG035F: Dissolved Mercury by FIMS (QCLot: 4763241)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	90.7	71.6	116
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4761383)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	94.6	90.0	117
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4763876)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	93.1	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4763875)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	98.9	71.9	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4758478)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	67.4	42.8	114
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	81.0	48.6	119
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	93.6	47.0	117
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	103	49.5	119
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	104	49.4	121
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	107	48.4	122
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	106	50.3	124
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	104	50.0	126
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	110	49.4	127
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	115	48.7	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	109	54.5	134
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	109	56.1	134
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	116	55.6	135
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	104	54.4	126
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	105	54.5	126



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP075(SIM): Polynuclear Aromatic Hydrocarbons (QCLot: 4758478) - continued								
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	101	54.4	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4758479)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4460 µg/L	84.4	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	14300 µg/L	94.8	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	7300 µg/L	95.1	50.4	127
EP071: C10 - C36 Fraction (sum)	----	50	µg/L	<50	26060 µg/L	93.2	51.5	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4758532)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	107	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4758479)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6090 µg/L	92.5	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	19400 µg/L	91.8	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1300 µg/L	102	47.2	130
EP071: >C10 - C40 Fraction (sum)	----	100	µg/L	<100	26790 µg/L	92.4	51.2	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4758532)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	106	66.2	132
EP080: BTEXN (QCLot: 4758532)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	89.0	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	83.3	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	89.6	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	116	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	91.2	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	114	68.3	131

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%)	Acceptable Limits (%)	
					MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 4763244)							
EM2224491-001	FD02	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	103	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	105	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	96.1	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	96.7	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	86.6	75.0	133
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	101	73.0	131



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 4763244) - continued							
EM2224491-001	FD02	EG020A-F: Zinc	7440-66-6	0.2 mg/L	101	75.0	131
EG035F: Dissolved Mercury by FIMS (QCLot: 4763241)							
EM2224371-005	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	72.7	70.0	120
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4761383)							
EM2224371-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4763876)							
EM2224484-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	82.0	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4763875)							
EM2224484-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	# Not Determined	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4758532)							
EM2224474-002	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	103	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4758532)							
EM2224474-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	97.5	34.0	122
EP080: BTEXN (QCLot: 4758532)							
EM2224474-002	Anonymous	EP080: Benzene	71-43-2	20 µg/L	113	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	116	60.4	132

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM2224491	Page	: 1 of 6
Client	: GHD PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: Leslie Maranciak	Telephone	: +6138549 9645
Project	: 12584780	Date Samples Received	: 09-Dec-2022
Site	:	Issue Date	: 16-Dec-2022
Sampler	: ----	No. of samples received	: 1
Order number	: 12584780	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	EM2224371--002	Anonymous	Nitrite + Nitrate as N	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EK067G: Total Phosphorus as P by Discrete Analyser	EM2224484--001	Anonymous	Total Phosphorus as P	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Regular Sample Surrogates

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP080S: TPH(V)/BTEX Surrogates	EM2224491-001	FD02	Toluene-D8	2037-26-5	130 %	70.0-125 %	Recovery greater than upper data quality objective
EP080S: TPH(V)/BTEX Surrogates	EM2224491-001	FD02	4-Bromofluorobenzene	460-00-4	132 %	71.0-129 %	Recovery greater than upper data quality objective

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	2	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	1	19	5.26	10.00	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	1	19	5.26	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	2	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	2	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	2	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Page : 3 of 6
 Work Order : EM2224491
 Client : GHD PTY LTD
 Project : 12584780



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) FD02	07-Dec-2022	----	----	----	13-Dec-2022	05-Jun-2023	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) FD02	07-Dec-2022	----	----	----	13-Dec-2022	04-Jan-2023	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) FD02	07-Dec-2022	----	----	----	14-Dec-2022	04-Jan-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) FD02	07-Dec-2022	13-Dec-2022	04-Jan-2023	✓	16-Dec-2022	04-Jan-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) FD02	07-Dec-2022	13-Dec-2022	04-Jan-2023	✓	16-Dec-2022	04-Jan-2023	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) FD02	07-Dec-2022	09-Dec-2022	14-Dec-2022	✓	12-Dec-2022	18-Jan-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) FD02	07-Dec-2022	09-Dec-2022	14-Dec-2022	✓	12-Dec-2022	18-Jan-2023	✓
Clear glass VOC vial - HCl (EP080) FD02	07-Dec-2022	09-Dec-2022	21-Dec-2022	✓	12-Dec-2022	21-Dec-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) FD02	07-Dec-2022	09-Dec-2022	14-Dec-2022	✓	12-Dec-2022	18-Jan-2023	✓
Clear glass VOC vial - HCl (EP080) FD02	07-Dec-2022	09-Dec-2022	21-Dec-2022	✓	12-Dec-2022	21-Dec-2022	✓
EP080: BTEXN							
Clear glass VOC vial - HCl (EP080) FD02	07-Dec-2022	09-Dec-2022	21-Dec-2022	✓	12-Dec-2022	21-Dec-2022	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	2	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	5.26	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	10.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	2	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	2	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	2	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)

Page : 6 of 6
Work Order : EM2224491
Client : GHD PTY LTD
Project : 12584780



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.



mgt

Sydney
 Unit P3 - 5 Building F, 16 Mairi Road, Lane Cove
 Phone: +612 9600 8400
 Email: enviro.syd@mgldemark.com.au

Brisbane
 Unit 1-21 Simalwood Place, Mullumbidgee
 Phone: +617 3902 4900
 Email: enviro.bris@mgldemark.com.au

Melbourne
 2 Kingston Town Close, Oakleigh, VIC 3166
 Phone: +613 8564 5000 Fax: +613 8564 5050
 Email: enviro.mel@mgldemark.com.au

CHAIN OF CUSTODY RECORD

Page 1 of 2

CLIENT DETAILS	Contact Name: Lachlan Parkinson	Purchase Order: 12584780	DOC Number:
Company Name: GHD	Project Manager: Leslie Maranciak	PROJECT number: 12584780	Eurofins | mgt quote ID: 160501GHD
Office Address: L3, 24 Honeysuckle Drive Newcastle 2300	Email for results: Leslie.Maranciak@ghd.com Lachlan.Parkinson@ghd.com	PROJECT Name: Aurizon Hexham Water Monitoring	Data output format: ESDAT

Special Directives & Comments: Please ensure fecal coliforms are reported in CFU/100ml	Analytes		Some common holding times (with correct preservation). For further information contact the lab.			
	Waters	Soils				
	BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days		
	TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days		
	Heavy Metals	6 months	Heavy Metals	6 months		
	Mercury, CrVI	28 days	Mercury, CrVI	28 days		
	Microbiological testing	24 hours	Microbiological testing	72 hours		
	BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days		
	Solids - TSS, TDS etc.	7 days	SPOCAS, pH Field and FOx, Cr5	24 hours		
	Ferrous Iron	7 days	ASLP, TCLP	7 days		

Sample ID	Date	Matrix	B4 (BTEXN / TRH / PAH)	Chloride Nitrate (AL, AL, Cl, Cl, Cl, Fe, Pb, Hg, Ni, Zn)	Oil Conductivity Turbidity Sulphate Solids	Arsenic	Solids BTA (Quinoline, Total N (TKN), NOX), Total P	Thermotolerant Coliforms (CFU/100ml)	900 5 Day	Send to ALS - same analysis as FD01 at ALS please	Containers:								
											1/1P	2/2P	1/25P	1/1A	40ml. vol	1/200. A	Jar		
1	101R	W	X	X	X	X	X	X	X										
2	101R	W	X	X	X	X	X	X	X										
3	MW101R	W	X	X	X	X	X	X	X										
4	MW105R	W	X	X	X	X	X	X	X										
5	MW105R	W	X	X	X	X	X	X	X										
6	MW109	W	X	X	X	X	X	X	X										
7	MW301R	W	X	X	X	X	X	X	X										
8	MW302R	W	X	X	X	X	X	X	X										
9	MW302R	W	X	X	X	X	X	X	X										
10	MW302R	W	X	X	X	X	X	X	X										
11	MW302R	W	X	X	X	X	X	X	X										
12	FD01	W	X	X			X												
13	FD02	W	X	X			X			X									

Environmental Division
 Melbourne
 Work Order Reference
EM2224491



Telephone: +61-3-9549 9000

Relinquished By: <i>L. Parkinson</i>	Received By: <i>Jaiden Stowman</i>	Turn around time: 1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/> 4 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:	Method Of Shipment: <input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal Courier Consignment #:	Temperature on arrival: 6.5
Date & Time: <i>7/12/22</i>	Date & Time: <i>2:07 7/12/22</i>			Report number:
Signature: <i>[Signature]</i>	Signature: <i>[Signature]</i>			

KN 10:40 9/12/22

OK -
5/12/22
 Relinquished by
 Jessica's Env
 @ 7:00 PM

Appendix F

Field sheets



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... Basin

PROJECT NO.: 12584780 DATE: 18/01/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:10
 CLIENT: Aurizon SAMPLING OFFICER: LB

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (is grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION -

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION Oversown reeds, pond scum and duck weed
 SLOPE -
 EROSION -
 OTHER -

FIELD MEASUREMENTS

TEMPERATURE (°C): 24.1 CONDUCTIVITY (uS/cm): 743
 pH: 7.51 DO (mg/L): 0.08
 REDOX (mV): -217.7 Turbidity (NTU): 9.1
 Sheen, Colour, Odour: No odour, No sheen, turbid, brown
 Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) cm/min
 CROSS SECTION WIDTH (m) cm
 DEPTH (m) cm
 OTHER _____

SAMPLE NO	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 1</u>		<u>- PARAMETERS ONLY -</u>		



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 2

PROJECT NO. 12584780 DATE: 18/01/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 09:00
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION -

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION along bank
 SLOPE -
 EROSION -
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C) 24.0°C CONDUCTIVITY (uS/cm): 1937
 pH: 7.22 DO (mg/L) 0.27
 REDOX (mV): -13.5 Turbidity (NTU) 64
 Sheen, Colour, Odour, No odour, No sheen, Brown, turbid
 Sediment Description duck weed in water, shallow pond

HYDROLOGICAL DATA

FLOW MEASUREMENT
 (or stream height if rating table available) <1m/min
 CROSS SECTION WIDTH (m) <1m
 DEPTH (m) <1m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>-</u>	<u>PARAMETERS ONLY</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID Basin 3

PROJECT NO. 12584780 DATE: 18/01/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 09:40
 CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION -

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION Overgrown, reeds in river, duck weed on surface
 SLOPE -
 EROSION -
 OTHER -

FIELD MEASUREMENTS

TEMPERATURE (°C): 23.3 CONDUCTIVITY (uS/cm): 1942
 pH: 7.56 DO (mg/L): 0.06
 REDOX (mV): -245.2 Turbidity (NTU): 3200
 Sheen, Colour, Odour, No odour, No sheen, turbid, Brown
 Sediment Description

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) <1m/min
 CROSS SECTION WIDTH (m) 1m
 DEPTH (m) <1m
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 3</u>	<u>-</u>	<u>PARAMETERS ONLY</u>	<u>-</u>	



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID Basin 1

PROJECT NO. 12534780 DATE: 28/2/22
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 11:10
 CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS
 WEATHER Fine
 VEGETATION reeds
 SLOPE _____
 EROSION _____
 OTHER _____

FIELD MEASUREMENTS
 TEMPERATURE (°C) 22.3 CONDUCTIVITY (uS/cm) 867
 pH: 7.27 DO (mg/L) 0.50
 REDOX (mV): -152.6 Turbidity (NTU) 6.6
 Sheen, Colour, Odour, Small amount of duck weed on surface,
 Sediment Description Bacterial sheen, Murky brown, turbid, scum (Hydrogen sulfide), odour

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available) 4lm/min
 CROSS SECTION WIDTH (m) 4m
 DEPTH (m) 4m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 1</u>	<u>~ PARAMETERS ONLY ~</u>			



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 2

PROJECT NO. 12584780 DATE: 28/2/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:30
 CLIENT: Aurizon SAMPLING OFFICER: CB

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION lots of reeds / pond scum / duck weed in pond
 SLOPE _____
 EROSION _____
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 21.4 CONDUCTIVITY (uS/cm): 1559
 pH: 6.80 DO (mg/L): 0.22
 REDOX (mV): -137.1 Turbidity (NTU): 35.4
 Sheen, Colour, Odour, Hydrogen sulfide (swamp) odour, No sheen, brown, turbid
 Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) cm/min
 CROSS SECTION WIDTH (m) cm
 DEPTH (m) cm
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>-</u>	<u>PARAMETERS ONLY</u>	<u>-</u>	



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 3

PROJECT NO. 12584780 DATE: 10:53 28/2/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: ↓ @ 28/2/22
 CLIENT: Aurizon SAMPLING OFFICER: _____

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION -

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION cat-tail reeds in pond
 SLOPE -
 EROSION -
 OTHER -

FIELD MEASUREMENTS

TEMPERATURE (°C): 21.1 CONDUCTIVITY (uS/cm): 1615
 pH: 7.22 DO (mg/L): 0.65
 REDOX (mV): -202.2 Turbidity (NTU): 78.3

Sheen, Colour, Odour: lots of duck weed floating, swamp/Hydrogen sulfide odour;
 Sediment Description: turbid, brown

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) cm/min
 CROSS SECTION WIDTH (m) cm
 DEPTH (m) cm
 OTHER: _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 3</u>	<u>-</u>	<u>PARAMETERS ONLY</u>	<u>-</u>	



SURFACE WATER & SEDIMENT SAMPLING RECORD

Basin 1

Location ID

PROJECT NO. 12552139 DATE: 9/3/ 2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 07:30
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER rain
 VEGETATION reeds see photo
 SLOPE no
 EROSION no
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C) 22.1 CONDUCTIVITY (uS/cm): 417.6
 pH 6.76 DO (mg/L) 0.30
 REDOX (mV) -128.5 Turbidity (NTU)
 Sheen, Colour, Odour, Slightly yellow, Slightly Turbid, rotten egg odour, no sheen.
 Sediment Description

CALCULATED BY LAB - NOT ON THIS WQM

HYDROLOGICAL DATA

FLOW MEASUREMENT
 (or stream height if rating table available)
 CROSS SECTION WIDTH (m)
 DEPTH (m)
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
Basin 1	8	ICE		



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 2

PROJECT NO: 12552139 DATE: 9/3/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 07:45
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER: Overcast / rain
 VEGETATION: lots of reeds See photos
 SLOPE: no
 EROSION: no
 OTHER: Rotten egg / sulfur odour

FIELD MEASUREMENTS

TEMPERATURE (°C): 22.3 CONDUCTIVITY (uS/cm): 754
 pH: 6.72 DO (mg/L): 2.58
 REDOX (mV): ~~784~~ -5.5 Turbidity (NTU): _____
 SHEEN, COLOUR, ODOUR: Slightly yellow, slightly Turbid, slight
 SEDIMENT DESCRIPTION: Sulfur odour, no sheen

CALCULATED BY LAB - NOT ON THIS WQM

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) _____
 CROSS SECTION WIDTH (m) _____
 DEPTH (m) _____
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>8</u>	<u>ICE</u>		



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 9

PROJECT NO. 12552139 DATE: 9/3/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 09:30
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER rain
 VEGETATION reeds
 SLOPE no
 EROSION no
 OTHER see photo

FIELD MEASUREMENTS

TEMPERATURE (°C): 21.7 CONDUCTIVITY (uS/cm): 1072
 pH: 6.58 DO (mg/L): 2.53
 REDOX (mV): -88.8 Turbidity (NTU):
 CALCULATED BY LAB - NOT ON THIS WQM

Sheen, Colour, Odour,

Sediment Description clear, Bacterial Sheen on water, Slightly turbid, trace black sediment in water, no od.

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available)
 CROSS SECTION WIDTH (m) AS prev. ROWID
 DEPTH (m)
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Bash 3</u>	<u>8</u>	<u>FCE</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID Sw1

PROJECT NO. 12552139 DATE: 9/3/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 08:00
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS
 WEATHER rain
 VEGETATION lots of floating grass and reeds
 SLOPE 10 See photo
 EROSION 10
 OTHER _____

FIELD MEASUREMENTS
 TEMPERATURE (°C): 22.7 CONDUCTIVITY (µS/cm): 5.8
 pH: 6.65 DO (mg/L): 1.84
 REDOX (mV): 41.1 Turbidity (NTU): CALCULATED BY LAB - NOT ON THIS WQM
 Sheen, Colour, Odour: Slightly Brown/orange, no odour, no sediment - Slightly Turbid
 Sediment Description: Moderate

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available) _____
 CROSS SECTION WIDTH (m) _____
 DEPTH (m) _____
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Sw1</u>	<u>8</u>	<u>ICE</u>		



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... **SW2**

PROJECT NO. 12552139 DATE: 9/3/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: **08:45**
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (If Applicable)
 SAMPLING METHOD (ie grab, bucket) **Grab**
 DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS
 WEATHER **overcast / rain**
 VEGETATION **no / river sample**
 SLOPE **no**
 EROSION **no**
 OTHER **See photo**

FIELD MEASUREMENTS
 TEMPERATURE (°C): **22.1** CONDUCTIVITY (uS/cm): **963**
 pH: **6.86** DO (mg/L): **0.72**
 REDOX (mV): **30.1** Turbidity (NTU): **CALCULATED BY LAB - NOT ON THIS WOM**
 Sheen, Colour, Odour: **Slight Bacterial Sheen on river**
 Sediment Description: **surface, slightly yellow, slightly turbid. no sediment no odour**

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available) **cm/min**
 CROSS SECTION WIDTH (m)
 DEPTH (m) **Same as last round**
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
SW2	8	ICE	-	



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... SV3

PROJECT NO. 12552139 DATE: 9/3/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 08:30
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (in grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER overcast / light rain
 VEGETATION no
 SLOPE no
 EROSION no
 OTHER see photos

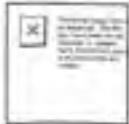
FIELD MEASUREMENTS

TEMPERATURE (°C): 21.1 CONDUCTIVITY (uS/cm): 598
 pH: 6.63 DO (mg/L): 0.01 to 0 (no reading)
 REDOX (mV): -107.4 Turbidity (NTU): _____
 SHEEN, COLOUR, ODOUR: Slightly Brown/yellow. Slightly Turbid, no odour
 SEDIMENT DESCRIPTION: lots of sediment and vegetation Bits in water

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) _____
 CROSS SECTION WIDTH (m) _____
 DEPTH (m) _____
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SV3</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW4

PROJECT NO. 12552139 DATE: 9/3/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 12:00
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket)

Grab

DETAILED SAMPLE LOCATION DESCRIPTION

collected opposite SW4A (same side as SW4A is) site

ENVIRONMENTAL OBSERVATIONS

WEATHER overcast
 VEGETATION reeds
 SLOPE 30°
 EROSION -
 OTHER see photo

FIELD MEASUREMENTS

TEMPERATURE (°C): 21.5 CONDUCTIVITY (µS/cm): 1653
 pH: 7.10 DO (mg/L): 0.13
 REDOX (mV): -36.2 Turbidity (NTU):
 CALCULATED BY LAB - NOT ON THIS WQM

Sheen, Colour, Odour: Dark Brown to orange, moderately turbid,
 Sediment Description: lots of vegetation and pond scum, no odour, no sheen (same as SW4A)

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available)
 CROSS SECTION WIDTH (m) as before round
 DEPTH (m)
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW4</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW4A

PROJECT NO.: 12552139 DATE: 9/3/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 11:40
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if applicable)

SAMPLING METHOD (ie grab, bucket)

DETAILED SAMPLE LOCATION DESCRIPTION

Grab
 Grab opposite SW4 (Sw4 if side side) (county side)

ENVIRONMENTAL OBSERVATIONS

WEATHER

Overcast light rain

VEGETATION

reeds

SLOPE

30°

EROSION

OTHER

See photo

FIELD MEASUREMENTS

TEMPERATURE (°C):

21.4

CONDUCTIVITY (µS/cm):

1596

pH:

7.10

DO (mg/L)

2.02

REDOX (mV):

-56.8

Turbidity (NTU)

CALCULATED BY LAB - NOT ON THIS WQM

Sheen, Colour, Odour,

Dark Brown to ^{orange} ~~black~~, moderately turbid,

Sediment Description

lots of vegetation and pond scum in view
NO odour, no sheen

HYDROLOGICAL DATA

FLOW MEASUREMENT

(or stream height if rating table available)

CROSS SECTION WIDTH (m)

AS PREV. round

DEPTH (m)

OTHER

SAMPLE NO	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW4A</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SWS

PROJECT NO: 12552139
PROJECT NAME: Aurizon TSF Hexham Monitoring
CLIENT: Aurizon

DATE: 9/3/2022
TIME: 10:00
SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)
SAMPLING METHOD (ie grab, bucket) Grab
DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER: Rain
VEGETATION: lots of reeds
SLOPE: no
EROSION: yes, along bank/reed line
OTHER: see photo

FIELD MEASUREMENTS

TEMPERATURE (°C): 22.3
pH: 6.46
REDOX (mV): -35.2
CONDUCTIVITY (uS/cm): 1186
DO (mg/L): 0.20
Turbidity (NTU): 0.20

CALCULATED BY LAB - NOT ON THIS WOM

Sheen, Colour, Odour.
Sediment Description

Slightly orange, moderate turbid, lots of orange sediment in water, Bacterial sheen. no odour
thick orange layer on top of water among reeds

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available)
CROSS SECTION WIDTH (m)
DEPTH (m)
OTHER

AS per. Lead

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SWS</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW6

PROJECT NO. 12552139 DATE: 9/3/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 11:10
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION Culvert under road

ENVIRONMENTAL OBSERVATIONS
 WEATHER overcast
 VEGETATION along bank
 SLOPE 10°
 EROSION no
 OTHER see photos

FIELD MEASUREMENTS
 TEMPERATURE (°C): 22.1 CONDUCTIVITY (uS/cm): 721
 pH: 5.73 DO (mg/L): 0.68
 REDOX (mV): -32.2 Turbidity (NTU) _____
 CALCULATED BY LAB - NOT ON THIS WDM

Sheen, Colour, Odour: Dark orange, moderately turbid, High Bacterial Sheen
 Sediment Description: on surface, thick orange layer on surface (see photos)
No odour, some orange sediment

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available) _____
 CROSS SECTION WIDTH (m) As Prev. Round
 DEPTH (m) _____
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW6</u>	<u>8</u>	<u>IC1</u>	<u>—</u>	<u>—</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW7

PROJECT NO. 12552139 DATE: 9/3/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:25
 CLIENT: Aurizon SAMPLING OFFICER: LP

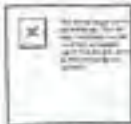
COORDINATES/GPS (If Applicable)
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION culvert under road

ENVIRONMENTAL OBSERVATIONS
 WEATHER Rain
 VEGETATION oregon grass
 SLOPE no
 EROSION no
 OTHER see photo

FIELD MEASUREMENTS
 TEMPERATURE (°C): 21.6 CONDUCTIVITY (uS/cm): 942
 pH: 6.19 DO (mg/L): 1.73
 REDOX (mV): 40.2 Turbidity (NTU): CALCULATED BY LAB - NOT ON THIS WQM
 Sheen, Colour, Odour, Slightly yellow, rotten egg odour, slightly
 Sediment Description turbid, slight bacterial sheen. no sediment

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available)
 CROSS SECTION WIDTH (m) As Prev. Road
 DEPTH (m)
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW7</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... SW8.....

PROJECT NO. 12552139 DATE: 9/3/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: _____
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER _____
 VEGETATION _____
 SLOPE _____
 EROSION _____
 OTHER _____

*unable to sample
Hunter river is flooded over pipe*

FIELD MEASUREMENTS

TEMPERATURE (°C): _____ CONDUCTIVITY (uS/cm): _____
 pH: _____ DO (mg/L) _____
 REDOX (mV): _____ Turbidity (NTU) _____
 Sheen, Colour, Odour: _____
 Sediment Description: _____

CALCULATED BY LAB – NOT ON THIS WOM

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) _____
 CROSS SECTION WIDTH (m) _____
 DEPTH (m) _____
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SwA

PROJECT NO. 12552139 DATE: 9/3/ 2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: _____
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER _____ unable to sample -
 VEGETATION _____ Hunter river is flooded over pipe
 SLOPE _____
 EROSION _____
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): _____ CONDUCTIVITY (µS/cm): _____
 pH _____ DO (mg/L) _____
 REDOX (mV): _____ Turbidity (NTU) _____
 Sheen, Colour, Odour, _____
 Sediment Description _____

CALCULATED BY LAB - NOT ON THIS WQM

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) _____
 CROSS SECTION WIDTH (m) _____
 DEPTH (m) _____
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW10

PROJECT NO. 12552138 DATE: 9/3/ 2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: _____
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (If Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Pipe is under water (under the Hunter river)
 VEGETATION - cannot sample
 SLOPE _____
 EROSION _____
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): _____ CONDUCTIVITY (uS/cm) _____
 pH: _____ DO (mg/L) _____
 REDOX (mV): _____ Turbidity (NTU) _____
 Sheen, Colour, Odour, _____
 Sediment Description _____

CALCULATED BY LAB - NOT ON THIS WQM

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) _____
 CROSS SECTION WIDTH (m) _____
 DEPTH (m) _____
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Sw11

PROJECT NO. 12552139 DATE: 9/3/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 09:00
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER overcast / rain
 VEGETATION no / river sample (down river from SW2)
 SLOPE no
 EROSION no
 OTHER see photo

FIELD MEASUREMENTS

TEMPERATURE (°C): 21.4 CONDUCTIVITY (uS/cm): 929
 pH: 6.91 DO (mg/L): 0.37
 REDOX (mV): -11.6 Turbidity (NTU): _____
 CALCULATED BY LAB - NOT ON THIS WQM

Sheen, Colour, Odour, Slightly. Brown, no od/no sheen, moderately turbid, lots of
 Sediment Description vegetation/leaves

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) 4m/min
 CROSS SECTION WIDTH (m) _____
 DEPTH (m) same as last round
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Sw11</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>-</u>



Purging and Sampling Record

Bore ID: **MW301R**

Job Information		Sampling Information			Bore Information		
Client: Aurizon		Purge Method: MP	Peri	SWL(mbTOC): 0.8		Logic Check: N/A	
Project: TSF Hexham Compliance Monitoring		Sample Method: MP	Peri	Screen: From:	to:	Stick Up: 10.2 m	
Proj. No.: 12552139		WQ Meter Type: YSI Pro Plus	-	NAPL Check: No NAPL		Bore Diam.: 50 mm	
Sampler: LP SH		Flow Cell: Y	Pump Depth:	Ref.datum: TOC		Well Cap Secure? Yes	
Date: 29/03/2022 24/3/22		WLevel Meter Type: Dip / Fox (Int.Fce) Gge		Bore Depth: 5.92 m		PID: N/A	
Round: March 2022		Field Filtered? Y / N (filter vessel, disposable filter/syringe)					

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	(NTU)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings)			± 0.05 pH	± 3%	± 10%	± 10 mV	stable		
13:20	0.5	19.9	6.61	6830	0.40	-86.3	0.82	15.4	No colour, No sheen clear to Slightly Brown/yellow Slightly Turbid
13:23	1.0	20.0	6.68	5418	0.20	-101.5	1.05	16.4	
13:26	1.5	20.1	6.76	4851	0.15	-112.6	1.18	25.0	
13:29	2.0	20.1	6.82	4891	0.13	-122.3	1.22	26.7	
13:32	2.5	20.2	6.90	3592	0.11	-125.1	1.25	31.5	
13:35	3.0	20.1	6.90	4672	0.11	-112.6	1.28	24.3	
13:38	3.5	20.1	6.87	4872	0.10	-110.1	1.29	22.0	
13:41	4.0	20.0	6.87	4912	0.10	-109.8	1.29	20.3	

Field QA Checks:

Air bubbles in vials? **Y** / N Any violent reactions? **Y** / N

Decontamination as per GHD procedure? **Y** / N

Was sampling equipment pre-cleaned? **Y** / N

COC updated? **Y** / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot.Metal	Biot.
Preservatives									

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc:

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (Lit of casing) 2.0 7.9 17.7
 *Double for gravel pack

Purging and Sampling Record

Job Information

Client: Aurizon
 Project: TSF Hexham Compliance Monitoring
 Proj. No.: 12552139
 Sampler: LP / SH
 Date: 23/03/2022
 Round: March

Sampling Information

Purge Method: MP Peri
 Sample Method: MP Peri
 WQ Meter Type: YSI Pro Plus
 Flow Cell: Y
 Pump Depth: 3 m
 WLevel Meter Type: Dip / Fox / Int. Fce / Gge
 Field Filtered Y / N (filter vessel / disposable filter / syringe)

Bore ID: MW01R

Bore Information

SWL(mbTOC): 1.16 m
 Screen: From: to: m
 NAPL Check: NA
 Ref.datum: TOC
 Bore Depth: 4.37 m
 Logic Check: N/A
 Stick Up: m
 Bore Diam.: 50 mm
 Well Cap Secure?
 PID: N/A

Time (:MM)	Volume (L)	Temp (°C)	pH (pH units)	Elec Cond (µS/cm)	Dis. Oxygen (mg/L)	Ox-Red Pt (± mV)	SWL (m TOC)	Comment:
1250	0.5	18.9	6.51	11000	0.26	-37.4	1.46	clear / slight yellow no odour / sheen slightly turbid
1253	1.0	18.8	6.46	10457	0.33	-31.9	1.51	
1256	1.5	19.1	6.29	9328	0.42	-22.0	1.64	
1259	2.0	19.2	6.18	8626	0.38	-16.6	1.74	
102	2.5	19.2	6.10	8039	0.38	-14.3	1.83	
105	3.0	19.2	6.01	7067	0.59	-11.3	1.92	
108	3.5	19.2	5.99	6095	0.56	-10.6	2.03	
311	4.0	19.5	5.98	5288	0.58	-10.1	2.04	

Field QA Checks:

Air bubbles in vials? Y / N
 Any violent reactions? Y / N
 Decontamination as per GHD procedure? Y / N
 Was sampling equipment pre-cleaned? Y / N
 TOC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.
Preservatives									

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc.

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack.



Purging and Sampling Record

Bore ID: **MW302R**

Job Information	Sampling Information	Bore Information
Client: Aurizon Project: TSF Hexham Compliance Monitoring Proj. No.: 12552139 Sampler: LP / SH Date: 29/03/2022 29/3/22 Round: March 2022	Purge Method: MP (Peri) Sample Method: MP (Peri) WQ Meter Type: YSI Pro Plus Flow Cell: Y Pump Depth: .....m WLevel Meter Type: Dip / Fox (Int.Fce) / Gge Field Filtered? Y / N (filter vessel, disposable filter/syringe)	SWL(mbTOC): 1.1 m Logic Check: N/A Screen: From: to: m Stick Up: +0.4 NAPL Check: NO NAPL Bore Diam.: 50 mm Ref.datum: TOC Bore Depth: 4.01 m PID...N/A Well Cap Secure? YES

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	NTU	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when /3 consecutive readings:			+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
11:00	0.5	20.7	6.98	670	4.91	-44.8	1.26	8.1	No odour, No sheen
11:03	1.0	20.6	6.65	1090	4.54	-60.4	1.28	10.0	
11:06	1.5	20.6	6.52	676	4.54	-59.2	1.28	11.0	No Sediment
11:09	2.0	20.5	6.47	305.0	4.75	1.6	1.29	56.6	
11:12	2.5	20.8	6.55	266.3	3.80	5.8	1.30	52.1	Slightly light brown to clear
11:15	3.0	20.7	6.55	251.1	4.99	6.2	1.30	35.0	Slightly Turbid
11:18	3.5	20.8	6.51	304.1	4.81	5.7	1.31	35.5	

Field QA Checks: Air bubbles in vials? Y / N Any violent reactions? Y / N Decontamination as per GHD procedure? Y / N Was sampling equipment pre-cleaned? Y / N COC updated? Y / N	<table border="1"> <tr> <th>Parameters</th> <th>BTEX</th> <th>TPH</th> <th>PAH</th> <th>CHC</th> <th>PCB</th> <th>OCP</th> <th>OPP</th> <th>Tot. Metal</th> <th>Biol.</th> <th>Total</th> </tr> <tr> <td>Preservations</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>5</td> </tr> </table>	Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.	Total	Preservations										5
Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.	Total													
Preservations										5													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc
FD01 + FD02

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack



Purging and Sampling Record

Bore ID: *AW 3013* *mw3013*

Job Information
 Client: Aurizon
 Project: TSF Hexham Compliance Monitoring
 Proj. No.: 12552139
 Sampler: LP SH
 Date: 23/03/2022 *7/4/22*
 Round: *March 22*

Sampling Information
 Purge Method: MP *(Peri)*
 Sample Method: MP *(Peri)*
 WQ Meter Type: YSI Pro Plus
 Flow Cell: Y
 Pump Depth:m
 WLevel Meter Type: Dip / Fox *(Int.Fce)* / Gge
 Field Filtered? *Y/N* (filter vessel, *disposable filter*/syringe)

Bore Information
 SWL(mbTOC): *0.68* m
 Screen: From: to: m
 NAPL Check: *No NAPL*
 Ref.datum: TOC
 Bore Depth: *3.92* m
 Logic Check: N/A
 Stick Up: *+0.3* m
 Bore Diam.: *50* mm
 Well Cap Secure? *No*
 PID...N/A

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red PL (± mV)	SWL (m TOC) (.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
<i>Stable when (3 consecutive readings):</i>								
<i>10:25</i>	<i>0.5</i>		<i>+/- 0.05 pH</i>	<i>+/- 3%</i>	<i>+/- 10%</i>	<i>+/- 10 mV</i>	<i>stable</i>	
<i>10:28</i>	<i>1.0</i>							<i>well surrounded By water</i>
<i>10:31</i>	<i>1.5</i>							<i>High sulfur odour</i>
<i>10:34</i>	<i>2.0</i>							<i>No sheen</i>
<i>10:37</i>	<i>2.5</i>							
								<i>Turbidity taken by lab</i>
								<i>Clear, Colourless, Non turbid</i>
								<i>No Parameters, TSI received water damage, would not turn on</i>

Field QA Checks:
 Air bubbles in vials? *Y/N* Any violent reactions? *Y/N*
 Decontamination as per GHD procedure? *Y/N*
 Was sampling equipment pre-cleaned? *Y/N*
 COC updated? *Y/N*

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	ToL Metal	Biol.
Preservatives									

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack



Purging and Sampling Record

Bore ID: MW109

Job Information		Sampling Information			Bore Information		
Client: Aurizon	Purge Method: MP <u>(Peri)</u>	SWL(mbTOC): <u>1.52</u> m	Logic Check: N/A	Project: TSF Hexham Compliance Monitoring	Sample Method: MP <u>(Peri)</u>	Screen: From: <u>-</u> to: <u>-</u> m	Stick Up: <u>+0.9</u> m
Proj. No.: 12552139	WQ Meter Type: YSI Pro Plus	NAPL Check: <u>No NAPL</u>	Bore Diam.: <u>50</u> mm	Sampler: <u>LP</u> SH	Flow Cell: Y	Ref.datum: TOC	Well Cap Secure? <u>No</u>
Date: 23/03/2022 <u>23/3</u>	Pump Depth: <u>-</u> m	Bore Depth: <u>3.41</u> m	PID: N/A	Round: <u>March 2022</u>	WLevel Meter Type: Dip / Fox <u>(Int.Fce)</u> / Gge		
	Field Filtered? <u>Y</u> / <u>N</u> (filter vessel, <u>disposable filter</u> / syringe)						

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC) (.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings)			+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable	
08:15	0.5	21.2	7.52	320A	0.38	-198.7	1.73	Moderate sulfur odour, No sheen
08:18	1.0	21.4	7.34	2704	0.24	-203.0	1.80	No sediment, Slightly turbid
08:21	1.5	21.5	7.32	2563	0.28	-203.5	1.88	Slightly clear to Brown
08:24	2.0	21.5	7.21	2265	0.26	-205.2	2.04	
08:27	2.5	21.5	7.21	2245	0.23	-206.0	2.09	
08:30	3.0	21.6	7.19	1855	0.21	-206.7	2.20	
08:33	3.5	21.5	7.10	1804	0.21	-203.7	2.29	Lab taken Turbidity readings
08:36	4.0	21.5	7.06	1842	0.24	-201.7	2.41	
08:39	4.5	21.5	7.05	1855	0.26	-199.1	2.48	

Field QA Checks: Air bubbles in vials? Y <u>(N)</u> Any violent reactions? Y <u>(N)</u> Decontamination as per GHD procedure? Y <u>(N)</u> Was sampling equipment pre-cleaned? Y <u>(N)</u> COC updated? Y <u>(N)</u>		<table border="1"> <thead> <tr> <th>Parameters</th> <th>BTEX</th> <th>TPH</th> <th>PAH</th> <th>CHC</th> <th>PCB</th> <th>OCP</th> <th>OPP</th> <th>Tot. Metal</th> <th>Biol.</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Preservatives</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>8</td> </tr> </tbody> </table>	Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.	Total	Preservatives										8
Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.	Total														
Preservatives										8														

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 2

PROJECT NO. 12552139 DATE: ~~23/3/2022~~ 24/3/22
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:00
 CLIENT: Aurizon SAMPLING OFFICER: LB

COORDINATES/GPS (if Applicable) _____

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Heavy Rain

VEGETATION _____

SLOPE AS PREV. ROUND

EROSION _____

OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C) 20.10 CONDUCTIVITY (uS/cm) 1357

pH: 7.13 DO (mg/L) 6.76

REDOX (mV) -164.9 Turbidity (NTU) 12.0

Sheen, Colour, Odour, no sheen, sulfur/organic odour, slightly yellow, slightly

Sediment Description turbid

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) 1m

CROSS SECTION WIDTH (m) 7m

DEPTH (m) 1m

OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: BASIN 1

PROJECT NO. 12552139 DATE: 21/3/2021
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 08:50
 CLIENT: Aurizon SAMPLING OFFICER: LW HAB M.S.

COORDINATES/GPS (If Applicable) -
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION -

ENVIRONMENTAL OBSERVATIONS

WEATHER Rain
 VEGETATION over grown
 SLOPE flat.
 EROSION none.
 OTHER

FIELD MEASUREMENTS

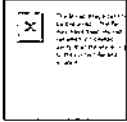
TEMPERATURE (°C): 20.5 CONDUCTIVITY (uS/cm): 495.3
 pH: 7.05 DO (mg/L) 1.32
 REDOX (mV): 223.1 Turbidity (NTU) -

Sheen, Colour, Odour, no sheens, strong organic odour, organic
 Sediment Description sediment load, pale yellow, no turbidity

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) < 1 m/s
 CROSS SECTION WIDTH (m)
 DEPTH (m) 0.4m
 OTHER -

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 1</u>	<u>5</u>	<u>ice</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID Basin 2

PROJECT NO. 12552139 DATE: 29/3/2021
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 0810
 CLIENT: Aurizon SAMPLING OFFICER: I.W. LAB M-J

COORDINATES/GPS (If Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Rain
 VEGETATION long & overgrown
 SLOPE NA
 EROSION NA
 OTHER -

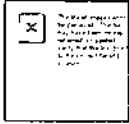
FIELD MEASUREMENTS

TEMPERATURE (°C): 20.7 CONDUCTIVITY (uS/cm): 564
 pH: 8.96 DO (mg/L): 2.65
 REDOX (mV): 0.2 Turbidity (NTU): -
 Sheen, Colour, Odour, no sheen / odours. Clear no colour
 Sediment Description no turbidity minor organics sed. load.

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) < 1m/s.
 CROSS SECTION WIDTH (m) TBD. Vegetation too overgrown.
 DEPTH (m) 0.4.
 OTHER -

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW1

PROJECT NO. 12552139 DATE: 29/3/2021
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 0910
 CLIENT: Aurizon SAMPLING OFFICER: ~~LW HAB~~ M. Swin

COORDINATES/GPS (If Applicable) ✓
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION ✓

ENVIRONMENTAL OBSERVATIONS
 WEATHER Rain.
 VEGETATION overgrown
 SLOPE mild slope.
 EROSION NA.
 OTHER

FIELD MEASUREMENTS
 TEMPERATURE (°C): 22.5 CONDUCTIVITY (uS/cm): 450.3
 pH: 6.71 DO (mg/L): 0.70
 REDOX (mV): -18.9 Turbidity (NTU): -
 Sheen, Colour, Odour, pale yellow, noturbidity, slight organic odour,
 Sediment Description minor organic sheen.

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available) < 1m/s.
 CROSS SECTION WIDTH (m) 5m.
 DEPTH (m) 0.9.
 OTHER -

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
SW1	8	ICE	-	-



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID Basin 3

PROJECT NO. 12552139 DATE: 29/3/2021
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 0935
 CLIENT: Aurizon SAMPLING OFFICER: ~~RW~~ ~~AB~~ M. Swi

COORDINATES/GPS (if Applicable) ✓
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION -

ENVIRONMENTAL OBSERVATIONS

WEATHER rain
 VEGETATION overgrown
 SLOPE generally flat
 EROSION none
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 19.4 CONDUCTIVITY (uS/cm): 1403
 pH: 6.26 DO (mg/L): 0.79
 REDOX (mV): -148.4 Turbidity (NTU): -
 Sheen, Colour, Odour, organic odour, slight turbidity, organic
 Sediment Description sediment load, pale brown.

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) with still
 CROSS SECTION WIDTH (m) refer to maps
 DEPTH (m) 0.5
 OTHER -

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 3</u>	<u>8</u>	<u>ice</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW7

PROJECT NO. 12552139 DATE: 29/3/2021
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:10am
 CLIENT: Aurizon SAMPLING OFFICER: ~~NW-AB1~~ M-Swin

COORDINATES/GPS (if Applicable) —
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION —

ENVIRONMENTAL OBSERVATIONS

WEATHER Rain
 VEGETATION Overgrown
 SLOPE generally flat.
 EROSION NA.
 OTHER —

FIELD MEASUREMENTS

TEMPERATURE (°C): 21.1 CONDUCTIVITY (uS/cm): 1587
 pH: 5.99 DO (mg/L): 0.51
 REDOX (mV): -35.2 Turbidity (NTU): —

Sheen, Colour, Odour, medium turbidity, orange brown, organic sed
 Sediment Description load, organic load, no sheens

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) 41m/s
 CROSS SECTION WIDTH (m) 2m
 DEPTH (m) 0.2
 OTHER —

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW7</u>	<u>8</u>	<u>ice</u>	<u>—</u>	<u>—</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW5

PROJECT NO. 12552139 DATE: 29/3/2021
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:20
 CLIENT: Aurizon SAMPLING OFFICER: ~~W. H. A. B.~~ M. J.

COORDINATES/GPS (If Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS
 WEATHER Rain
 VEGETATION R. overgrown
 SLOPE minor
 EROSION NA
 OTHER _____

FIELD MEASUREMENTS
 TEMPERATURE (°C): 20.2 CONDUCTIVITY (uS/cm): 1914
 pH: 6.38 DO (mg/L): 0.77
 REDOX (mV): -60.2 Turbidity (NTU): _____
 Sheen, Colour, Odour, Sediment Description
Turbid, organic red load, orangy brown, organic odour, minor, organic sheen.

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available) 4m/s
 CROSS SECTION WIDTH (m) 6m
 DEPTH (m) 0.2
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW5</u>	<u>8</u>	<u>ice</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID..... *Sw 6*.....

PROJECT NO. 12552139 DATE: *29/3/2021*
PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: *10:30*
CLIENT: Aurizon SAMPLING OFFICER: ~~HW~~ A.B. *MS*

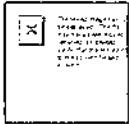
COORDINATES/GPS (if Applicable) _____
SAMPLING METHOD (ie grab, bucket) *Grab*
DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS
WEATHER *Rain*
VEGETATION *Overgrown*
SLOPE *gentle*
EROSION *NA*
OTHER _____

FIELD MEASUREMENTS
TEMPERATURE (°C): *20.6* CONDUCTIVITY (µS/cm): *982*
pH: *6.71* DO (mg/L): *5.33*
REDOX (mV): *-44.4* Turbidity (NTU) _____
Sheen, Colour, Odour, *slight turbidity, slight organic sed load,*
Sediment Description *minor organic sheens/odours.*

HYDROLOGICAL DATA
FLOW MEASUREMENT
(or stream height if rating table available) *2/m*
CROSS SECTION WIDTH (m) _____
DEPTH (m) *0.4*
OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<i>Sw 6</i>	<i>5</i>	<i>ice</i>	<i>—</i>	<i>—</i>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID..... *SW4*

PROJECT NO. 12552139 DATE: *29/3/2021*

PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: *11:00*

CLIENT: Aurizon SAMPLING OFFICER: *I.W. TAB m.s.*

COORDINATES/GPS (if Applicable) _____

SAMPLING METHOD (ie grab, bucket) *Grab*

DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS:

WEATHER *Rain*

VEGETATION *overgrown*

SLOPE *gentle*

EROSION *NA*

OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): *20.8* CONDUCTIVITY (uS/cm): *1124*

pH: *7.01* DO (mg/L): *1.31*

REDOX (mV): *-96.9* Turbidity (NTU) _____

Sheen, Colour, Odour, *Turbid, brown, organic sheens/odours,*

Sediment Description *organic sed load.*

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) *4m/s*

CROSS SECTION WIDTH (m) *8m*

DEPTH (m) *0.7*

OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<i>SW4</i>	<i>8</i>	<i>ice</i>	<i>—</i>	<i>—</i>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW4A

PROJECT NO. 12552139 DATE: 29/3/2021
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 11:05
 CLIENT: Aurizon SAMPLING OFFICER: LW A.B M.S.

COORDINATES/GPS (If Applicable) —
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION —

ENVIRONMENTAL OBSERVATIONS
 WEATHER rain
 VEGETATION Overgrown
 SLOPE gentle
 EROSION none
 OTHER

FIELD MEASUREMENTS
 TEMPERATURE (°C): 20.5 CONDUCTIVITY (uS/cm): 2176
 pH: 7.22 DO (mg/L): 2.33
 REDOX (mV): -96.9 Turbidity (NTU) —
 Sheen, Colour, Odour, same as SW4.
 Sediment Description

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available) 47m/s
 CROSS SECTION WIDTH (m) 10m
 DEPTH (m) 0.8
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW4A</u>	<u>1</u>	<u>100</u>	<u>—</u>	<u>—</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW3

PROJECT NO. 12552139 DATE: 22/3/2021
PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 11:30
CLIENT: Aurizon SAMPLING OFFICER: ~~I.W. HAB~~ M.S.

COORDINATES/GPS (If Applicable) —
SAMPLING METHOD (ie grab, bucket) Grab
DETAILED SAMPLE LOCATION DESCRIPTION —

ENVIRONMENTAL OBSERVATIONS
WEATHER Rain
VEGETATION overgrown
SLOPE gentle
EROSION NA
OTHER

FIELD MEASUREMENTS
TEMPERATURE (°C): 22.0 CONDUCTIVITY (uS/cm): 1207
pH: 7.38 DO (mg/L): 0.60
REDOX (mV): -131.4 Turbidity (NTU) —
Sheen, Colour, Odour, Turbid, brownish yellow, organic odours/
Sediment Description sheens, organic seed load.

HYDROLOGICAL DATA
FLOW MEASUREMENT (or stream height if rating table available) <1m/s
CROSS SECTION WIDTH (m) 7m
DEPTH (m) 0.7
OTHER —

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW3</u>	<u>1</u>	<u>ice</u>	<u>—</u>	<u>—</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW2

PROJECT NO. 12552139 DATE: 29/8/2021
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: ca 11.50
 CLIENT: Aurizon SAMPLING OFFICER: I.W. TAB R.S.

COORDINATES/GPS (if Applicable) —
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION —

ENVIRONMENTAL OBSERVATIONS

WEATHER Rain
 VEGETATION overgrown
 SLOPE gentle
 EROSION none
 OTHER —

FIELD MEASUREMENTS

TEMPERATURE (°C): 22.8 CONDUCTIVITY (uS/cm): ~~484~~ 484.8
 pH: 6.82 DO (mg/L): 0.92
 REDOX (mV): -6.2 Turbidity (NTU): —
 Sheen, Colour, Odour, clear, pale yellow, slight organic sed
 Sediment Description load, no sheens / odours.

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) 2 km/s
 CROSS SECTION WIDTH (m) 15m
 DEPTH (m) 1m
 OTHER —

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW2</u>	<u>8</u>	<u>ice</u>	<u>—</u>	<u>—</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW11

PROJECT NO. 12552139 DATE: 29/8/2021
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 12:10
 CLIENT: Aurizon SAMPLING OFFICER: I.W. HAB M.S.

COORDINATES/GPS (if Applicable) —
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION —

ENVIRONMENTAL OBSERVATIONS

WEATHER Rain
 VEGETATION Overgrown
 SLOPE gentle
 EROSION none
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 23.0 CONDUCTIVITY (uS/cm): 423.5
 pH: 6.78 DO (mg/L): 0.60
 REDOX (mV): 10.0 Turbidity (NTU) —
 Sheen, Colour, Odour. same as SW2

Sediment Description

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) clay/s
 CROSS SECTION WIDTH (m) 8m
 DEPTH (m) 0.2
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW11</u>	<u>8</u>	<u>10</u>	<u>—</u>	



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW10

PROJECT NO. 12552139 DATE: 28/3/2021
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 1250
 CLIENT: Aurizon SAMPLING OFFICER: I.W. / A.B. M.S.

COORDINATES/GPS (If Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS !
 WEATHER Rain
 VEGETATION Overgrown
 SLOPE NA
 EROSION NA
 OTHER _____

FIELD MEASUREMENTS
 TEMPERATURE (°C): _____ CONDUCTIVITY (uS/cm): _____
 pH: _____ DO (mg/L) _____
 REDOX (mV): _____ Turbidity (NTU) _____
 Sheen, Colour, Odour, No discharge
 Sediment Description _____

HYDROLOGICAL DATA
 FLOW MEASUREMENT
 (or stream height if rating table available) _____
 CROSS SECTION WIDTH (m) _____
 DEPTH (m) _____
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>1</u>	<u>1</u>	_____	_____	_____



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... SW8

PROJECT NO. 12552139 DATE: 29/3/2021
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 12:47
 CLIENT: Aurizon SAMPLING OFFICER: ~~HW~~ ~~AB~~ MS

COORDINATES/GPS (if Applicable) —
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION —

ENVIRONMENTAL OBSERVATIONS

WEATHER Rain
 VEGETATION Overgrown
 SLOPE N/A.
 EROSION N/A.
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 21.5 CONDUCTIVITY (uS/cm): 859
 pH: 7.32 DO (mg/L): 6.43
 REDOX (mV): -42.0 Turbidity (NTU) —
 Sheen, Colour, Odour, brown slightly turbid. no sheen/
 Sediment Description odours

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) < 1 m/s.
 CROSS SECTION WIDTH (m) Flow N/A.
 DEPTH (m) 0.8 N/A
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW8</u>	<u>5</u>	<u>ice</u>	<u>—</u>	<u>—</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... SW9.

PROJECT NO. 12552139 DATE: 29/3/2021

PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 12:55

CLIENT: Aurizon SAMPLING OFFICER: ~~I.W. # A.B.~~ M.S.

COORDINATES/GPS (If Applicable) —

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION —

ENVIRONMENTAL OBSERVATIONS

WEATHER Rain

VEGETATION Overgrown

SLOPE NA

EROSION NA

OTHER —

FIELD MEASUREMENTS

TEMPERATURE (°C): 22.3 CONDUCTIVITY (uS/cm): 11.8

pH: 7.55 DO (mg/L): 15.18

REDOX (mV): -376 Turbidity (NTU): —

Sheen, Colour, Odour, clear, not turbid, no sheens/odour.

Sediment Description —

HYDROLOGICAL DATA

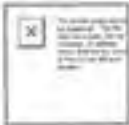
FLOW MEASUREMENT (or stream height if rating table available) < 1 m/s.

CROSS SECTION WIDTH (m) NA

DEPTH (m) NA

OTHER —

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW9</u>	<u>1</u>	<u>ice</u>	<u>—</u>	<u>—</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... Basin 1

PROJECT NO. 12552139 DATE: 23/01/2022 7/9/22
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 07:50
 CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER: Fine
 VEGETATION: reeds
 SLOPE: 10°
 EROSION: along Bank
 OTHER: _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 18.4 CONDUCTIVITY (uS/cm): 407.5
 pH: 7.90 DO (mg/L): 2.24
 REDOX (mV): -221.1 Turbidity (NTU): -
 Sheen, Colour, Odour: no sheen, no od. Brown and Turbid
 Sediment Description: _____

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) <1m
 CROSS SECTION WIDTH (m) 7m
 DEPTH (m) <1m
 OTHER: _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>PARAMETERS ONLY</u>				



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... Basin 2

PROJECT NO. 12552139 DATE: ~~23/31 2022~~ 7/4/22
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 07:35
 CLIENT: Aurizon SAMPLING OFFICER: 8

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (is grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION along bank, reeds in river
 SLOPE 15°
 EROSION -
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 18.3 CONDUCTIVITY (uS/cm): 1265
 pH: 7.92 DO (mg/L): 0.43
 REDOX (mV): -176.4 Turbidity (NTU): -
 Sheen, Colour, Odour, None - No od, No sheen, turbid, Brown
 Sediment Description -

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) <1m
 CROSS SECTION WIDTH (m) >1m
 DEPTH (m) <1m
 OTHER -

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>PARAMETERS ONLY</u>	<u>ONLY</u>			



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 1

PROJECT NO. 12552139 DATE: 5/5/2022 4/5/2022
PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 13:22
CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if Applicable) _____
SAMPLING METHOD (ie grab, bucket) Grab
DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine/sunny
VEGETATION Reeds in pond. Bushes on bank.
SLOPE 10°
EROSION -
OTHER Pond scum on surface, turbid, Brown water to sediment, no odour

FIELD MEASUREMENTS

TEMPERATURE (°C) 16.2 CONDUCTIVITY (uS/cm): 736
pH 7.11 DO (mg/L) 0.30
REDOX (mV) -201.2 Turbidity (NTU) 25.63
Sheen, Colour, Odour, AS ABOVE
Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) cm/min
CROSS SECTION WIDTH (m) 2/m
DEPTH (m) 1/m
OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
	<u>PARAMETERS ONLY</u>			



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... Basin 2

PROJECT NO.: 12552139 DATE: 4/5/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 12:38
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (If Applicable)

SAMPLING METHOD (ie grab, bucket)

Grab

DETAILED SAMPLE LOCATION DESCRIPTION

Basin 2 / weir

ENVIRONMENTAL OBSERVATIONS

WEATHER: Fine, Sunny
 VEGETATION: Reeds in pond, overgrown grass along bank, lots of vegetation on water surface
 SLOPE: 45°
 EROSION: along bank near Basin
 OTHER:

FIELD MEASUREMENTS

TEMPERATURE (°C): 16.5 CONDUCTIVITY (uS/cm): 1540
 pH: 7.8 DO (mg/L): 0.60
 REDOX (mV): 33.6 Turbidity (NTU): 43.22

Sheen, Colour, Odour: SW = No sheen, Brown very turbid, no odour

Sediment Description

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available): <1m/min
 CROSS SECTION WIDTH (m): 71m
 DEPTH (m): <1m
 OTHER:

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
	<u>PARAMETERS</u>	<u>ONLY</u>		



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 3

PROJECT NO. 12552139 DATE: ~~5/5/2022~~ 4/5/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 13:00
 CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine, Sunny
 VEGETATION Reeds in river/pond
 SLOPE 15°
 EROSION Can't see
 OTHER High/Thick Bacterial sheen, No odour, Brown, turbid, green flower vegetation on surface
unbroken

FIELD MEASUREMENTS

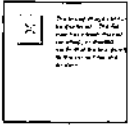
TEMPERATURE (°C):	<u>15.2</u>	CONDUCTIVITY (uS/cm):	<u>1787</u>
pH:	<u>6.65</u>	DO (mg/L):	<u>0.28</u>
REDOX (mV):	<u>-163.7</u>	Turbidity (NTU):	<u>13.25</u>

Sheen, Colour, Odour: _____
 Sediment Description: _____

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) cm/min
 CROSS SECTION WIDTH (m) 7m
 DEPTH (m) 1m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
	<u>PARAMETERS ONLY</u>	<u>ONLY</u>		



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 1

PROJECT NO. 12552139 DATE: 30/5/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 12:20
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine, windy
 VEGETATION Reeds in pond
 SLOPE 20°
 EROSION along Bank
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 13.3 CONDUCTIVITY (uS/cm): 840
 pH: 7.22 DO (mg/L): 0.12
 REDOX (mV): -62.1 Turbidity (NTU): Taken By Lab
 Sheen, Colour, Odour: Bacterial Sheen, slight Hydrogen Sulfide odour, non-turbid, slightly
 Sediment Description: light yellow, no sediment

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) >1m
 CROSS SECTION WIDTH (m) >1m
 DEPTH (m) <1m
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 1</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>AS ABOVE</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 2

PROJECT NO. 12552139 DATE: 30/5/ 2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 08:15
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (If Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION Reeds in pond, vegetation on surface
 SLOPE 45°
 EROSION none to see
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 12.4° CONDUCTIVITY (uS/cm): 1292
 pH: 6.85 DO (mg/L): 1.66
 REDOX (mV): 14.3 Turbidity (NTU) Taken By LAB

Sheen, Colour, Odour, Clear, colourless, small amount of vegetation and sediment, no odour
~~Sediment Description~~ No sheen

HYDROLOGICAL DATA

FLOW MEASUREMENT
 (or stream height if rating table available)
 CROSS SECTION WIDTH (m)
 DEPTH (m)
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>AS ABOVE</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: **Basin 3**

PROJECT NO. 12552139 DATE: 30/5/2022
PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:15
CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine

VEGETATION Reeds in pond, overgrown grass on bank

SLOPE 30°

EROSION along bank

OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C) 13.7

CONDUCTIVITY (µS/cm) 2044

pH 6.28

DO (mg/L) 1.09

REDOX (mV) 16.7

Turbidity (NTU)

Taken by LAB

Sheen, Colour, Odour, No odour, ~~no sheen~~, very small amount of

Sediment Description

flowers/vegetation on surface, slight Bacterial Sheen

HYDROLOGICAL DATA

FLOW MEASUREMENT

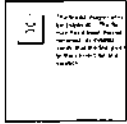
(or stream height if rating table available) <1m

CROSS SECTION WIDTH (m) >1m

DEPTH (m) <1m

OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
Basin 3	8	ICE	-	AS ABOVE



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... SW1

PROJECT NO. 12552139 DATE: 30/5/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 12:35
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine, windy
 VEGETATION None
 SLOPE 10°
 EROSION none
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 13.5 CONDUCTIVITY (uS/cm): 550.7
 pH: 7.24 DO (mg/L): 4.55
 REDOX (mV): 3.3 Turbidity (NTU): Taken BY LAB
 Sheen, Colour, Odour, No sheen, No odour, Slightly turbid, light yellow, No
 Sediment Description Sediment
+ rusted Metal pipe in^{across} water

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) 7ly/min
 CROSS SECTION WIDTH (m) 1m
 DEPTH (m) 1m
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW1</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>AS ABOVE</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW2

PROJECT NO. 12552139 DATE: 30/5/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 09:20
 CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION None
 SLOPE 0°
 EROSION None
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 12.8 CONDUCTIVITY (uS/cm): 526.2
 pH: 7.08 DO (mg/L): 3.18
 REDOX (mV): 4.1 Turbidity (NTU): Taken By Lab
 Sheen, Colour, Odour, No odour, No sheen, Slightly turbid, light yellow, no sediment
 Sediment Description

HYDROLOGICAL DATA

FLOW MEASUREMENT
 (or stream height if rating table available)
 CROSS SECTION WIDTH (m)
 DEPTH (m)
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW2</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>AS ABOVE</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW3

PROJECT NO. 12552139 DATE: 30/5/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 09:00
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION lots of flowers/vegetation on surface
 SLOPE 5°
 EROSION none
 OTHER

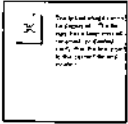
FIELD MEASUREMENTS

TEMPERATURE (°C): 11.5 CONDUCTIVITY (uS/cm): 1065
 pH: 6.74 DO (mg/L) 0.41
 REDOX (mV): -61.3 Turbidity (NTU) Taken By LAB
 Sheen, Colour, Odour, No odour, No sheen, slightly turbid, light yellow, small
 Sediment Description amount of flowers/vegetation

HYDROLOGICAL DATA

FLOW MEASUREMENT
 (or stream height if rating table available)
 CROSS SECTION WIDTH (m)
 DEPTH (m)
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW3</u>	<u>8</u>	<u>ICE</u>	<u>✓</u>	<u>AS ABOVE</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... SW4

PROJECT NO. 12552139 DATE: 30/5/ 2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 11:40
 CLIENT: Aurizon SAMPLING OFFICER: CP

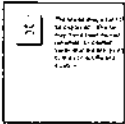
COORDINATES/GPS (If Applicable)
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS
 WEATHER
 VEGETATION SAME AS SW4A Fine
 SLOPE
 EROSION ↓
 OTHER

FIELD MEASUREMENTS
 TEMPERATURE (°C): 13.6 CONDUCTIVITY (uS/cm): 2490
 pH: 6.77 DO (mg/L): ~~0.33~~ 0.36
 REDOX (mV): 11.9 Turbidity (NTU) Taken By LAB
 Sheen, Colour, Odour, No odour, No sheen, lots of flowers/vegetation on surface
 Sediment Description Very turbid, dark orange/black

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available) SAME AS SW4A
 CROSS SECTION WIDTH (m)
 DEPTH (m) ↓
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW4</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>AS ABOVE</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... SW4A

PROJECT NO. 12552139 DATE: 30/5/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 11:15
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (If Applicable)
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION Reeds in river
 SLOPE 30°
 EROSION none
 OTHER

FIELD MEASUREMENTS

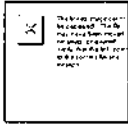
TEMPERATURE (°C): 13.0 CONDUCTIVITY (uS/cm): 2238
 pH: ~~8.24~~ 6.78 DO (mg/L): 8.24
 REDOX (mV): 22.4 Turbidity (NTU): taken by LAB

Sheen, Colour, Odour, No odour, No sheen, lots of orange OM and flowers/vegetation
 Sediment Description on surface (orange OM layer on surface), very turbid, Dark orange/Brown

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) < 1m
 CROSS SECTION WIDTH (m) < 1m
 DEPTH (m) < 1m
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW4A</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>AS ABOVE</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... SW5

PROJECT NO. 12552139 DATE: 30/5/ 2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:40
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (If Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION lots of reeds in pond/location, very small amount of water, water
 SLOPE 0° ± is thick with orange vegetation/organic matter
 EROSION -
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 15.3 CONDUCTIVITY (uS/cm): 1846
 pH: 6.32 DO (mg/L): 0.42
 REDOX (mV): 10.8 Turbidity (NTU) Taken by LAB
 Sheen, Colour, Odour, lots of orange organic matter (a thick paste of orange 'sludge' on surface)
 Sediment Description Bacterial sheen, no odour, very turbid, very dark orange

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) <1m
 CROSS SECTION WIDTH (m) <1m
 DEPTH (m) <1m
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW5</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>AT ABOVE</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... SW6.....

PROJECT NO. 12552139 DATE: 30/5/2022
PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 09:50
CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
VEGETATION Grass around water, reeds in culvert opening.
SLOPE 15°
EROSION -
OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 12.5 CONDUCTIVITY (uS/cm): 1927
pH: 6.69 DO (mg/L): 2.10
REDOX (mV): 8.1 Turbidity (NTU): taken By LAB
Sheen, Colour, Odour, Bacterial sheen, mild Hydrogen sulfide odour, moderately turbid,
Sediment Description light orange, medium amount of orange sediment

HYDROLOGICAL DATA

FLOW MEASUREMENT
(or stream height if rating table available) NONE
CROSS SECTION WIDTH (m) <1m
DEPTH (m) <1m
OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW6</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>AS ABOVE</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW7

PROJECT NO. 12552139 DATE: 30/5/2022
PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 11:00
CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine

VEGETATION overgrown grass near culvert.

SLOPE

EROSION

OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 14.3

CONDUCTIVITY (uS/cm): 2115

pH: 6.25

DO (mg/L) 2.87

REDOX (mV): 19.7

Turbidity (NTU) Taken by LAB

Sheen, Colour, Odour, Slight Bacterial Sheen, lots of orange sediment on surface (thick layer on surface), very turbid, orange colour

Sediment Description

HYDROLOGICAL DATA

FLOW MEASUREMENT

(or stream height if rating table available) <1m

CROSS SECTION WIDTH (m) <1m

DEPTH (m) <1m

OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW7</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>AT ABOVE</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW8

PROJECT NO. 12552139 DATE: 30/5/2022

PROJECT NAME: Aurizon TSF Hexham Monitoring TIME:

CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER HUNTER RIVER FLOODING

VEGETATION

SLOPE PIPE. NO SAMPLE

EROSION

OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C):

CONDUCTIVITY (uS/cm):

pH:

DO (mg/L)

REDOX (mV):

Turbidity (NTU)

Sheen, Colour, Odour,

Sediment Description

HYDROLOGICAL DATA

FLOW MEASUREMENT
(or stream height if rating table available)

CROSS SECTION WIDTH (m)

DEPTH (m)

OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... SW9

PROJECT NO. 12552139 DATE: 30/5/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 12:55
 CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION asbestos pipe into Hunter river

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION none
 SLOPE out of pipe
 EROSION -
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 18.3 CONDUCTIVITY (uS/cm): 8003
 pH: 7.05 DO (mg/L): 3.01
 REDOX (mV): 33.8 Turbidity (NTU): taken by LAB

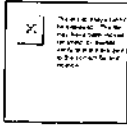
Sheen, Colour, Odour. Clear, colourless, no odour, No sheen, no sediment

Sediment Description

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) >1m/min (flow out of pipe)
 CROSS SECTION WIDTH (m) 1m
 DEPTH (m) 1m
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
SW9	8	ICE	-	AT ABOVE



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW10

PROJECT NO. 12552139 DATE: 30/5/ 2022

PROJECT NAME: Aurizon TSF Hexham Monitoring TIME:

CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER

VEGETATION

SLOPE

EROSION

OTHER

NO DISCHARGE
NO SAMPLE

FIELD MEASUREMENTS

TEMPERATURE (°C): CONDUCTIVITY (uS/cm):

pH: DO (mg/L)

REDOX (mV): Turbidity (NTU)

Sheen, Colour, Odour,

Sediment Description

HYDROLOGICAL DATA

FLOW MEASUREMENT

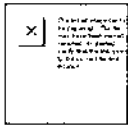
(or stream height if rating table available)

CROSS SECTION WIDTH (m)

DEPTH (m)

OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID *Sw11*

PROJECT NO. 12552139 DATE: 30/5/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: *09:35*
 CLIENT: Aurizon SAMPLING OFFICER: *LP*

COORDINATES/GPS (If Applicable)

SAMPLING METHOD (ie grab, bucket) *Grab*

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER *Fine*
 VEGETATION *NONE*
 SLOPE *NONE*
 EROSION *None*
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): *12.4* CONDUCTIVITY (uS/cm): *518.3*
 pH: *7.03* DO (mg/L): *3.64*
 REDOX (mV): *3.7* Turbidity (NTU): *Taken By Lab*
 Sheen, Colour, Odour, *No sheen, No odour, Slightly turbid, light yellow, No*
 Sediment Description *Sediment*

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available)
 CROSS SECTION WIDTH (m)
 DEPTH (m)
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<i>Sw11</i>	<i>8</i>	<i>ICE</i>	<i>-</i>	<i>As ABOVE</i>



Purging and Sampling Record

Bore ID: MW01R

Job information		Sampling information			Bore information		
Client: Aurizon	Purge Method: MP <u>(Peri)</u>	SWL(mbTOC): <u>1.225</u> m	Logic Check: N/A				
Project: TSF Hexham Compliance Monitoring	Sample Method: MP <u>(Peri)</u>	Screen: From:.....to..... m	Stick Up:.....m				
Proj. No.: 12584780	WQ Meter Type: YSI Pro Plus	NAPL Check: <u>NA</u>	Bore Diam.: <u>50</u> mm				
Sampler: LP / <u>SH</u>	Flow Cell: Y	Ref.datum: TOC	Well Cap Secure? <u>9.8 N.</u>				
Date: 15/06/2022	Pump Depth:.....m	Bore Depth: <u>4.375</u> m	PID...N/A				
Round: <u>June 2022</u>	WLevel Meter Type: Dip / Fox <u>(Int.Fce) Gge</u>						
	Field Filtered? <u>Y/N</u> (filter vessel, <u>disposable filter/syringe</u>)						

Time (.....A.M)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond (µS/cm)	Dis. Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	Turbidity (.NTU)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings)		-	±/- 0.05 pH	±/- 3%	±/- 10%	±/- 10 mV	stable		
855	0.5	16.9	6.18	6553	1.04	-44.9	1.50	42.52	clear / colourless
857	1.0	17.1	5.93	5977	0.60	-62.9	1.59	43.20	no odour / sheen
858	1.5	16.2	5.72	5236	0.44	-44.1	1.70	79.30	↓
859	2.0	15.9	5.66	5090	0.39	-32.4	1.78	79.28	
900	2.5	16.0	5.73	5200	0.37	-36.3	1.87	70.90	
901	3.0	15.9	5.71	5099	0.33	-36.7	1.94	68.09	clear w/ slight yellow
902	3.5	16.1	5.72	5128	0.31	-42.9	2.05	65.78	no odour & sheen
									SWL not stabilising
									same as sampled

Field QA Checks: Air bubbles in vials? Y <u>(N)</u> Any violent reactions? Y <u>(N)</u> Decontamination as per GHD procedure? Y / N Was sampling equipment pre-cleaned? Y <u>(N)</u> COC updated? Y <u>(N)</u>	<table border="1"> <thead> <tr> <th>Parameters</th> <th>BTEX</th> <th>TPH</th> <th>PAH</th> <th>CHC</th> <th>PCB</th> <th>OCP</th> <th>OPP</th> <th>Tot. Metal</th> <th>Biol.</th> </tr> </thead> <tbody> <tr> <td>Preset values</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.	Preset values									
Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.												
Preset values																					

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack



Purging and Sampling Record

Bore ID: MW308R

Job Information		Sampling Information			Bore Information		
Client: Aurizon	Purge Method: MP <input checked="" type="radio"/> Peri	SWL(mbTOC): <u>0.651</u> m	Logic Check: N/A				
Project: TSF Hexham Compliance Monitoring	Sample Method: MP <input checked="" type="radio"/> Peri	Screen: From:.....to..... m	Stick Up:.....m				
Proj. No.: 12584780	WQ Meter Type: YSI Pro Plus	NAPL Check: <u>N/A</u>	Bore Diam.: <u>50</u> mm				
Sampler: LP / <input checked="" type="radio"/> SH	Flow Cell: Y	Ref.datum: TOC	Well Cap Secure? <u>N</u>				
Date: 15/06/2022	Pump Depth:.....m	Bore Depth: <u>3.97</u> m	PID...N/A				
Round: <u>June</u>	WLevel Meter Type: Dip / Fox / <input checked="" type="radio"/> Int.Fce / Gge						
	Field Filtered? <input checked="" type="radio"/> Y / <input type="radio"/> N (filter vessel / <input checked="" type="radio"/> disposable filter / <input type="radio"/> syringe)						

Time (...A.M...)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond (µS/cm)	Dis. Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	Turbidity (NTU)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when 3 consecutive readings?		-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
1014	0.5	16.8	6.40	7779	1.21	-65.1	1.15	7.19	clear / colourless
1015	1.0	16.4	6.31	7319	0.56	-63.3	1.30	22.50	no odour or sheen
1016	1.5	15.7	6.29	6418	0.33	-61.9	1.35	36.49	
1017	2.0	13.6	6.26	5550	0.23	-57.7	1.46	86.10	
1018	2.5	13.3	6.26	5430	0.27	-45.3	1.53	120.14	↓ - possibly better ↓
1019	3.0	13.4	6.24	5170	0.29	-47.3	1.70	80.36	clear colourless w/ fine brown sediment
1020	3.5	13.4	6.24	5276	0.23	-49.3	1.80	70.93	slight turbidity
1021	4.0	13.6	6.25	5360	0.20	-52.3	1.90	62.96	no o/s
									↓ same when sampled

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N

Decontamination as per GHD procedure? Y / N

Was sampling equipment pre-cleaned? Y / N

COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes
Casing Int. Dia (mm) 50 100 150
Vol (L/m of casing) 2.0 7.9 17.7
*Double for gravel pack



Purging and Sampling Record

Bore ID: MW307R

Job Information		Sampling Information			Bore Information		
Client: Aurizon	Purge Method: MP <u>Peri</u>	SWL(mbTOC): <u>1.34</u> m	Logic Check: N/A	Screen: From:..... to..... m	Stick Up:.....m	Bore Diam.: <u>52</u> mm	Well Cap Secure? <u>N</u>
Project: TSF Hexham Compliance Monitoring	Sample Method: MP <u>Peri</u>	NAPL Check: <u>NA</u>	Ref.datum: TOC	Bore Depth: <u>5.98</u> m	PID...N/A		
Proj. No.: 12584780	WQ Meter Type: YSI Pro Plus	Flow Cell: Y	Pump Depth:.....m				
Sampler: LP / <u>SH</u>	WLevel Meter Type: Dip / Fox / <u>Int.Fce</u> / Gge	Field Filtered? <u>Y</u> / <u>N</u> (filter vessel, <u>disposable filter/syringe</u>)					
Date: 15/06/2022							
Round: <u>June</u>							

Time (<u>AM</u>)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond. (<u>µS/cm</u>)	Dis. Oxygen (<u>mg/L</u>)	Ox-Red Pt. (± mV)	SWL (m TOC)	Turbidity (<u>NTU</u>)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):									
		-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
1048	0.5	18.4	7.13	34129	1.30	-121.1	1.72	9.36	clear
1049	1.0	18.6	7.14	34034	0.50	-114.8	1.82	8.36	yellow
1050	1.5	18.7	7.15	33614	0.28	-113.8	2.21	9.06	no odour / sheen
1051	2.0	18.7	7.15	33130	0.22	-115.8	2.56	12.18	↓ same when sampled.
1052	2.5	18.7	7.16	32560	0.18	-118.4	2.70	11.12	
1053	3.0	18.8	7.17	32001	0.16	-122.1	2.92	9.82	

Field QA Checks:		Parameters												
Air bubbles in vials? <u>Y</u> / <u>N</u>	Any violent reactions? <u>Y</u> / <u>N</u>	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Decontamination as per GHD procedure? <u>Y</u> / <u>N</u>	Was sampling equipment pre-cleaned? <u>Y</u> / <u>N</u>	Preservative												
COC updated? <u>Y</u> / <u>N</u>														

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L) of casing 2.0 7.9 17.7
 *Double for gravel pack



Purging and Sampling Record

Bore ID: MW1012

Job Information	Sampling Information	Bore Information
Client: Aurizon	Purge Method: MP <input checked="" type="radio"/> Peri	SWL(mbTOC): 0.68 m
Project: TSF Hexham Compliance Monitoring	Sample Method: MP <input checked="" type="radio"/> Peri	Screen: From: to: m
Proj. No.: 12584780	WQ Meter Type: YSI Pro Plus	NAPL Check: NA
Sampler: LP / <input checked="" type="radio"/> SH	Flow Cell: Y	Ref.datum: TOC
Date: 15/06/2022	Pump Depth: .....m	Bore Depth: 3.23 m
Round: June	WLevel Meter Type: Dip / Fox / Int.Fce / Gge	Logic Check: N/A
	Field Filtered? <input checked="" type="radio"/> Y / <input checked="" type="radio"/> N (filter vessel, disposable filter/syringe)	Stick Up: .....m
		Bore Diam: 50 mm
		Well Cap Secure? <input checked="" type="radio"/> Y
		PID: N/A

Time (PM)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Condc. (µS/cm)	Dis. Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	Turbidity (NTU)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
			±0.05 pH	±3%	±10%	±10 mV	stable		
1325	0.5	17.9	6.43	25945	0.30	-173.5	0.73	19.58	heavy black sediment
1326	1.0	17.9	6.43	25835	0.20	-168.5	0.73	18.66	turbid
1327	1.5	17.8	6.44	25953	0.14	-173.2	0.73	18.74	bacterial sheen, manure odour
1328	2.0	17.7	6.45	25455	0.10	-179.5	0.73	17.98	fast recharge
1329	2.5	17.6	6.45	24941	0.08	-176.7	0.73	18.23	
1330	3.0	17.4	6.43	24823	0.06	-173.6	0.73	18.36	
									↓ more clear / less turbid colourless less black sediment bacterial sheen, manure odour

Field QA Checks:	Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.
Air bubbles in vials? Y <input checked="" type="radio"/> N <input checked="" type="radio"/>	Preservatives									
Any violent reactions? Y <input checked="" type="radio"/> N <input checked="" type="radio"/>										
Decantation as per GHD procedure? Y <input checked="" type="radio"/> N <input checked="" type="radio"/>										
Was sampling equipment pre-cleaned? Y <input checked="" type="radio"/> N <input checked="" type="radio"/>										
COC updated? Y <input checked="" type="radio"/> N <input checked="" type="radio"/>										

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc.

Purge Volumes:
Casing Int. Dia (mm) 50 100 150
Vol (Lit of casing) 2.0 7.9 17.7
*Double for gravel pack

RBO2 taken after off 1P - 5/6



Purging and Sampling Record

Bore ID: NW108R

Job Information	Sampling Information	Bore Information
Client: Aurizon	Purge Method: MP <input checked="" type="radio"/> Peri	SWL(mbTOC): <u>2.12</u> m
Project: TSF Hexham Compliance Monitoring	Sample Method: MP <input checked="" type="radio"/> Peri	Screen: From: to: m
Proj. No.: 12584780	WQ Meter Type: YSI Pro Plus	NAPL Check: <u>NA</u>
Sampler: LP / SH	Flow Cell: Y	Ref.datum: TOC
Date: 15/06/2022	Pump Depth: m	Bore Diam.: <u>50</u> mm
Round: <u>June</u>	WLevel Meter Type: Dip / Fox <input checked="" type="radio"/> Int.Fce <input type="radio"/> Gge	Well Cap Secure? <u>Y</u>
	Field Filtered? <input checked="" type="radio"/> Y <input type="radio"/> N (filler vessel, <input checked="" type="radio"/> disposable filter/syringe)	Bore Depth: <u>4.02</u> m
		PID...N/A

Time (Am)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond. (µS/cm)	Dis.Oxygen (mg/L)	Ox-Red PL (± mV)	SWL (m TOC)	Turbidity (NTU)	Comment:
Stable when (3 consecutive readings).									
			+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
1134	0.5	18.7	6.60	3008	5.28	70.5	2.14	61.56	brown
1133	1.0	18.7	6.57	3018	4.84	65.2	2.15	130.30	turbid
1134	1.5	18.7	6.56	3020	4.60	67.1	2.15	92.36	no odour or sheen
1135	2.0	18.7	6.56	3053	4.24	59.3	2.15	87.86	
1136	2.5	18.7	6.55	3081	3.50	52.6	2.15	76.56	
1137	3.0	18.7	6.55	3095	3.17	49.4	2.15	33.85	
1138	3.5	18.8	6.55	3126	3.15	44.8	2.15	28.78	
1139	4.0	18.8	6.55	3130	3.10	43.4	2.15	17.54	more less brown/colourless less turbid/clear. no odour/sheen ↓ as above when sampled

Field QA Checks:
 ? Y / N Any violent reactions? Y / N
 per GHD procedure? N
 not pre-cleaned? N

Parameters/Preservations	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.

collected, bottles used, access, condition of headworks etc

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack

Purging and Sampling Record

Bore ID: MW301R

Job Information	Sampling Information	Bore Information
Client: Aurizon Project: TSF Hexham Compliance Monitoring Proj. No.: 12584780 Sampler: <u>LP</u> SH Date: 15/06/2022 Round: <u>June 2022</u>	Purge Method: MP <u>Peri</u> Sample Method: MP <u>Peri</u> WQ Meter Type: YSI Pro Plus Flow Cell: Y Pump Depth: .....m WLevel Meter Type: Dip / Fox <u>Int.Fce</u> / Gge Field Filtered? <u>Y</u> / <u>N</u> (filter vessel, <u>disposable filter</u> / syringe)	SWL(mbTOC): <u>0.63</u> m Screen: From: to: m NAPL Check: <u>No NAPL</u> Ref.datum: TOC Bore Depth: <u>4.90</u> m Logic Check: N/A Stick Up: <u>10.2</u> m Bore Diam.: <u>50</u> mm Well Cap Secure? <u>Yes</u> PID...N/A

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	Turbidity (.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
11:00	0.5	16.3	6.77	350 L	0.39	-59.8	1.10	311.37	No odour, No sheen, slightly turbid, pale yellow. small amount of black dirt/sediment in water
11:03	1.0	16.0	6.81	2927	0.29	-55.8	1.14	389.41	
11:06	1.5	15.9	6.84	2852	0.25	-54.2	1.28	207.12	
11:09	2.0	15.8	6.85	2804	0.21	-54.1	1.32	94.22	
11:12	2.5	16.0	6.90	3639	0.15	-55.8	1.30	55.28	
11:15	3.0	15.8	6.85	3021	0.13	-56.2	1.31	85.62	
11:18	3.5	15.8	6.83	3059	0.12	-56.3	1.38	55.61	
11:21	4.0	15.8	6.81	3164	0.11	-56.9	1.42	53.01	
11:24	4.5	15.8	6.76	3310	0.13	-57.1	1.45	51.25	
11:27	5.0	16.3	6.69	5521	0.13	-57.1	1.46	43.06	
11:30	5.5	16.2	6.70	5450	0.13	-57.2	1.49	39.12	
11:33	6.0	16.2	6.72	5300	0.13	-61.3	1.52	38.34	

Field QA Checks:
 Air bubbles in vials? Y / N Any violent reactions? Y / N
 Decontamination as per GHD procedure? Y / N
 Was sampling equipment pre-cleaned? Y / N
 COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.	Total Bacteria
Preservatives										8

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack

Purging and Sampling Record

Bore ID: MW302R

Job Information		Sampling Information			Bore Information		
Client: Aurizon	Purge Method: MP <u>Peri</u>	SWL(mbTOC): <u>140</u> m	Logic Check: N/A	Screen: From: <u>-</u> to: <u>-</u> m	Stick Up: <u>70.5</u> m	Bore Diam.: <u>50</u> mm	Well Cap Secure? <u>Yes</u>
Project: TSF Hexham Compliance Monitoring	Sample Method: MP <u>Peri</u>	NAPL Check: <u>No NAPL</u>	Ref.datum: TOC	WQ Meter Type: YSI Pro Plus	Pump Depth: <u>-</u> m	Bore Depth: <u>3.97</u> m	PID: N/A
Proj. No.: 12584780	Flow Cell: Y	Field Filtered? <u>Y/N</u> (filter vessel, <u>disposable filter/syringe</u>)		Sampler: <u>LP/SH</u>			
Date: 15/06/2022	WLevel Meter Type: Dip / Fox (<u>Int.Fce</u>) / Gge			Round: <u>June 2022</u>			

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	Turbidity (.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):									
		-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
09:25	0.5	17.3	6.91	2778	0.55	1.9	1.59	268.50	No odour, No sheen, slightly turbid, slightly yellow, small amount of orange sediment
09:28	1.0	17.1	6.29	2784	0.27	-1.5	1.62	160.10	
09:31	1.5	17.0	6.28	2788	0.22	-5.9	1.63	139.61	
09:34	2.0	17.0	6.28	2755	0.18	-9.8	1.64	142.71	
09:37	2.5	16.8	6.31	2543	0.19	-19.7	1.65	143.56	
09:40	3.0	16.7	6.38	2180	0.17	-34.0	1.65	119.01	
09:43	3.5	16.6	6.40	2056	0.17	-38.6	1.65	95.65	
09:46	4.0	16.6	6.42	1980 ¹⁹⁵⁰	0.15	-41.6	1.65	80.50	
09:49	4.5	16.6	6.43	1897	0.15	-44.0	1.65	73.69	
09:52	5.0	16.6	6.43	1870	0.15	-46.7	1.65	55.46	

Field QA Checks:

Air bubbles in vials? Y/N Any violent reactions? Y/N

Decontamination as per GHD procedure? Y/N

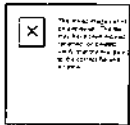
Was sampling equipment pre-cleaned? Y/N

COC updated? Y/N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.	Total Bottles
Preservatives										8

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc
FD01 + FD02

Purge Volumes
Casing Int. Dia (mm) 50 100 150
Vol (L/m of casing) 2.0 7.9 17.7
*Double for gravel pack



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... Basin 1

PROJECT NO. 12584780 DATE: 15/6/ 2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 12:00
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Windy - Fine
 VEGETATION Reeds in pond
 SLOPE -
 EROSION -
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 8.9 CONDUCTIVITY (uS/cm): 870
 pH: 7.19 DO (mg/L) 0.95
 REDOX (mV): -34.0 Turbidity (NTU) 599.25

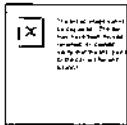
Sheen, Colour, Odour. No sheen, NO odour, Non-turbid, clear/colourless, Small amount

Sediment Description of Black sediment / vegetation

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) >1m
 CROSS SECTION WIDTH (m) <1m
 DEPTH (m) <1m
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 1</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... Basin 2

PROJECT NO. 12584780 DATE: 15/6/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 07:50
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER
 VEGETATION Fine reeds in pond
 SLOPE
 EROSION
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 8.3 CONDUCTIVITY (uS/cm): 1699
 pH: 7.05 DO (mg/L): 3.20
 REDOX (mV): 139.0 Turbidity (NTU): 0.80
 Sheen, Colour, Odour, no sheen, No odour, clear to colourless, medium amount
 Sediment Description of black dirt sediment and vegetation in water

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) <1m
 CROSS SECTION WIDTH (m) <1m
 DEPTH (m) <1m
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: *Bash 3*

PROJECT NO. 12584780 DATE: 15/6/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 13:20
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS
 WEATHER *Windy - Fine*
 VEGETATION *reeds in pond*
 SLOPE
 EROSION
 OTHER

FIELD MEASUREMENTS
 TEMPERATURE (°C): *8.6* CONDUCTIVITY (uS/cm): *2037*
 pH: *6.31* DO (mg/L): *0.56*
 REDOX (mV): *-82.1* Turbidity (NTU): *3.50*
 Sheen, Colour, Odour, *No sheen, No odour Slight Bacterial Sheen / pond scum on*
 Sediment Description *Surface / vegetation on surface, slightly turbid, slightly yellow, slight swamp odour, some vegetation / sediment in water*

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available) *> 1m*
 CROSS SECTION WIDTH (m) *< 1m*
 DEPTH (m) *< 1m*
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<i>Bash 3</i>	<i>8</i>	<i>ICE</i>	<i>-</i>	<i>-</i>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID Basin 1

PROJECT NO. 12584780
PROJECT NAME: Aurizon TSF Hexham Monitoring
CLIENT: Aurizon

DATE: 06/07/2022
TIME: 11:20
SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
SAMPLING METHOD (ie grab, bucket) Grab
DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Rain
VEGETATION Reeds in pond - pond flooded
SLOPE _____
EROSION _____
OTHER pond flooded

FIELD MEASUREMENTS

TEMPERATURE (°C): 14.8 CONDUCTIVITY (uS/cm): 519
pH: 6.50 DO (mg/L): 0.34
REDOX (mV): -122.2 Turbidity (NTU): 1.89
Sheen, Colour, Odour: Murky Brown to clear, slightly turbid,
Sediment Description: No odour, no sheen, some vegetation in samples

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) _____ sh/min
CROSS SECTION WIDTH (m) _____ sh
DEPTH (m) _____ 1m
OTHER _____ flooded

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>LP 45 Basin 1</u>	<u>8</u>	<u>Ice</u>	<u>-</u>	<u>45 above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID Basin 2

PROJECT NO. 12584780 DATE: 06/07/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 07:40
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER overcast and rain
 VEGETATION reeds in pond
 SLOPE -
 EROSION -
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 15.4 CONDUCTIVITY (uS/cm): 397.6
 pH: 6.36 DO (mg/L): 2.25
 REDOX (mV): 194.5 Turbidity (NTU): 5.89

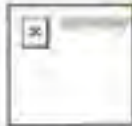
Sheen, Colour, Odour, no odour, no sheen, clear to slightly murky brown

Sediment Description no sediment

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) > 1m/min
 CROSS SECTION WIDTH (m) 7m
 DEPTH (m) 1m
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>As above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... Basin 3

PROJECT NO. 12584780 DATE: 06/07/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:55
 CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER overcast + rain
 VEGETATION reeds and cattails in pond
 SLOPE -
 EROSION -
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 13.9 CONDUCTIVITY (uS/cm): 1741
 pH: 5.81 DO (mg/L): 0.10
 REDOX (mV): -111.2 Turbidity (NTU): 5.61
 Sheen, Colour, Odour: Slight bacterial sheen, clear to slightly murky
 Sediment Description: brown, non-turbid, no odour, no sediment

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) <1m/min
 CROSS SECTION WIDTH (m) >1m
 DEPTH (m) >1m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 3</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>as above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... SW1

PROJECT NO. 12584780 DATE: 06/07/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 11:45
 CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (is grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION —

ENVIRONMENTAL OBSERVATIONS

WEATHER rain
 VEGETATION —
 SLOPE —
 EROSION —
 OTHER *very thick, almost solid / flooded location (still below culvert)
green floating flowers/vegetation

FIELD MEASUREMENTS

TEMPERATURE (°C): 15.5 CONDUCTIVITY (uS/cm): 378.6
 pH: 6.44 DO (mg/L): 7.51
 REDOX (mV): 82.3 Turbidity (NTU): 7.04
 Sheen, Colour, Odour: murky, Brown, moderately turbid, no odours
 Sediment Description: no sheen, *green floating flowers/vegetation on surface

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) >1m
 CROSS SECTION WIDTH (m) >1m
 DEPTH (m) >1m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW1</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>as above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW2

PROJECT NO. 12584780 DATE: 06/07/2022

PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: _____

CLIENT: Aurizon SAMPLING OFFICER: _____

COORDINATES/GPS (If Applicable) _____

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER _____

VEGETATION _____

SLOPE _____

EROSION _____

OTHER _____

*unable to
access due to
flood at Hexham
farmland*

FIELD MEASUREMENTS

TEMPERATURE (°C): _____ CONDUCTIVITY (µS/cm): _____

pH: _____ DO (mg/L) _____

REDOX (mV): _____ Turbidity (NTU) _____

Sheen, Colour, Odour, _____

Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT
(or stream height if rating table available) _____

CROSS SECTION WIDTH (m) _____

DEPTH (m) _____

OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... SW3

PROJECT NO: 12584780 DATE: 06/07/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: _____
 CLIENT: Aurizon SAMPLING OFFICER: _____

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER _____
 VEGETATION _____
 SLOPE _____
 EROSION _____
 OTHER _____

Unable to access due to flood at Hexham farmland

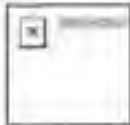
FIELD MEASUREMENTS

TEMPERATURE (°C): _____ CONDUCTIVITY (uS/cm): _____
 pH: _____ DO (mg/L): _____
 REDOX (mV): _____ Turbidity (NTU): _____
 Sheen, Colour, Odour, _____
 Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) _____
 CROSS SECTION WIDTH (m) _____
 DEPTH (m) _____
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW4

PROJECT NO. 12584780 DATE: 06/07/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 09:00
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (If Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Overcast + windy
 VEGETATION grass in pond
 SLOPE -
 EROSION -
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 15.3 CONDUCTIVITY (uS/cm): 609
 pH: 6.44 DO (mg/L): 4.48
 REDOX (mV): 96.3 Turbidity (NTU): 9.41

Sheen, Colour, Odour, no odour, no sediment, murky brown, moderately
 Sediment Description turbid, trace vegetation and black organic matter

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) > 1m/min
 CROSS SECTION WIDTH (m) > 1m
 DEPTH (m) < 1m
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW4</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>As Above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW4A

PROJECT NO: 12584780 DATE: 06/07/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 08:45
 CLIENT: Aurizon SAMPLING OFFICER: LB

COORDINATES/GPS (If Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER overcast
 VEGETATION reeds in pond
 SLOPE
 EROSION
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 15.4 CONDUCTIVITY (uS/cm): 530
 pH: 6.62 DO (mg/L): 4.58
 REDOX (mV): 157.8 Turbidity (NTU): 37.37
 Sheen, Colour, Odour, moderately turbid, clear to orange, lots of orange
 Sediment Description OM/sediment in water, no odour, no sheen

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) km/min
 CROSS SECTION WIDTH (m) >1m
 DEPTH (m) <1m
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW4A</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>AS ABOVE</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW5

PROJECT NO. 12594780 DATE: 06/07/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:30
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER overcast + rain
 VEGETATION Cattails and reeds in pond
 SLOPE _____
 EROSION _____
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 14.6 CONDUCTIVITY (uS/cm): 524
 pH: 5.71 DO (mg/L): 1.82
 REDOX (mV): 83.7 Turbidity (NTU): 6240

Sheen, Colour, Odour, Dark orange, lots of orange organic matter
 Sediment Description vegetation, slight bacterial sheen, no odour

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) < 1m/min
 CROSS SECTION WIDTH (m) 1m
 DEPTH (m) < 1m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW5</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>as above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW6

PROJECT NO. 12584780 DATE: 06/07/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:20
 CLIENT: Aurizon SAMPLING OFFICER: LB

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER overcast, light rain
 VEGETATION reeds and overgrown grass
 SLOPE -
 EROSION -
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 15.1 CONDUCTIVITY (uS/cm): 373.9
 pH: 5.88 DO (mg/L): 4.54
 REDOX (mV): 126.4 Turbidity (NTU): 36.50
 Sheen, Colour, Odour: clear to pale milky brown non-turbid, no odour
 Sediment Description: no sheen, no sediment

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) 7m/min
 CROSS SECTION WIDTH (m) <1m
 DEPTH (m) <1m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW6</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>As above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW7

PROJECT NO. 12584780 DATE: 06/07/2022
PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 11:00
CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (If Applicable) _____

SAMPLING METHOD (Is grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER rain
VEGETATION grass
SLOPE -
EROSION -
OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 15.2 CONDUCTIVITY (uS/cm): 437.6
pH: 5.89 DO (mg/L): 5.09
REDOX (mV): 74.5 Turbidity (NTU): 6.14
Sheen, Colour, Odour: no odour, no sheen, clear to slightly
Sediment Description: murky, brown, non-turbid, no sediment

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) _____ dm/min
CROSS SECTION WIDTH (m) _____ dm
DEPTH (m) _____ dm
OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW7</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>as above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW8

PROJECT NO. 12584780 DATE: 06/07/2022

PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: _____

CLIENT: Aurizon SAMPLING OFFICER: _____

COORDINATES/GPS (if Applicable) _____

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER _____ *Flooded*

VEGETATION _____

SLOPE _____ *B+*

EROSION _____ *Hunter River*

OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): _____ CONDUCTIVITY (uS/cm): _____

pH: _____ DO (mg/L) _____

REDOX (mV): _____ Turbidity (NTU) _____

Sheen, Colour, Odour, _____

Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) _____

CROSS SECTION WIDTH (m) _____

DEPTH (m) _____

OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW9

PROJECT NO. 12584780 DATE: 06/07/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: _____
 CLIENT: Aurizon SAMPLING OFFICER: _____

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS
 WEATHER _____
 VEGETATION _____
 SLOPE _____
 EROSION _____
 OTHER _____

Flooded by Hunter River

FIELD MEASUREMENTS
 TEMPERATURE (°C): _____ CONDUCTIVITY (uS/cm): _____
 pH: _____ DO (mg/L): _____
 REDOX (mV): _____ Turbidity (NTU): _____
 Sheen, Colour, Odour, _____
 Sediment Description _____

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available) _____
 CROSS SECTION WIDTH (m) _____
 DEPTH (m) _____
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID..... SW10

PROJECT NO. 12584780 DATE: 06/07/2022

PROJECT NAME: Aurizon TSF Hesham Monitoring TIME: _____

CLIENT: Aurizon SAMPLING OFFICER: _____

COORDINATES/GPS (if Applicable) _____

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER _____

VEGETATION _____

SLOPE _____

EROSION _____

OTHER _____

*Flooded
By Hunter RIVER*

FIELD MEASUREMENTS

TEMPERATURE (°C): _____ CONDUCTIVITY (uS/cm): _____

pH: _____ DO (mg/L) _____

REDOX (mV): _____ Turbidity (NTU) _____

Sheen, Colour, Odour, _____

Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT
(or stream height if rating table available) _____

CROSS SECTION WIDTH (m) _____

DEPTH (m) _____

OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW 11

PROJECT NO. 12584780 DATE: 06/07/2022

PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: _____

CLIENT: Aurizon SAMPLING OFFICER: _____

COORDINATES/GPS (if Applicable) _____

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER _____

VEGETATION _____

SLOPE _____

EROSION _____

OTHER _____

Unable to access due to flood at Hexham farmland

FIELD MEASUREMENTS

TEMPERATURE (°C): _____ CONDUCTIVITY (uS/cm): _____

pH: _____ DO (mg/L): _____

REDOX (mV): _____ Turbidity (NTU): _____

Sheen, Colour, Odour, _____

Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) _____

CROSS SECTION WIDTH (m) _____

DEPTH (m) _____

OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... Basin 1

PROJECT NO. 12584780 DATE: 18/7/22
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:20
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS
 WEATHER Fire
 VEGETATION along bank - reeds
 SLOPE _____
 EROSION _____
 OTHER _____

FIELD MEASUREMENTS
 TEMPERATURE (°C) 10.6 CONDUCTIVITY (uS/cm): 256.3
 pH: 6.28 DO (mg/L): 0.76
 REDOX (mV): -13.2 Turbidity (NTU) 13.89
 Sheen, Colour, Odour: No odour, no sheen, brown, turbid
 Sediment Description _____

HYDROLOGICAL DATA
 FLOW MEASUREMENT
 (or stream height if rating table available) _____
 CROSS SECTION WIDTH (m) _____
 DEPTH (m) _____
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 1</u>	<u>No</u>	<u>Sample / only</u>	<u>parameters</u>	



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 2

PROJECT NO. 12584780 DATE: 18/7/22
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 09:15
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS
 WEATHER Fine
 VEGETATION along bank - reeds
 SLOPE _____
 EROSION _____
 OTHER _____

FIELD MEASUREMENTS
 TEMPERATURE (°C) 10.5 CONDUCTIVITY (uS/cm) 865
 pH: 6.42 DO (mg/L) 1.34
 REDOX (mV) -102.3 Turbidity (NTU) 63.87
 Sheen, Colour, Odour, No odour, no sheen, lots of vegetation/moss floating on surface
 Sediment Description brown, turbid

HYDROLOGICAL DATA
 FLOW MEASUREMENT
 (or stream height if rating table available) _____
 CROSS SECTION WIDTH (m) _____
 DEPTH (m) _____
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>- no sample</u>	<u>/ field</u>	<u>parameters only</u>	



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 3

PROJECT NO. 12584780 DATE: 18/7/22
PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 09:40
CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (If Applicable) _____

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine

VEGETATION along bank - reeds

SLOPE _____

EROSION _____

OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C) 10.8 CONDUCTIVITY (µS/cm) 1005

pH 5.70 DO (mg/L) 4.86

REDOX (mV) 59.1 Turbidity (NTU) 6.23

Sheen, Colour, Odour, No odour, no sheen, brown, turbid.

Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT
(or stream height if rating table available) _____

CROSS SECTION WIDTH (m) _____

DEPTH (m) _____

OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 3</u>	<u>-</u>	<u>field parameters only</u>	<u>-</u>	<u>no sample</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 1

PROJECT NO. 12584780 DATE: 8/8/22
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:40
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION reeds in river and on banks
 SLOPE _____
 EROSION _____
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 11.6 CONDUCTIVITY (uS/cm): 500
 pH: 6.80 DO (mg/L): 0.5
 REDOX (mV): -76.4 Turbidity (NTU): 3.59
 Sheen, Colour, Odour: Brown, turbid, no odor, no sheen
 Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT
 (or stream height if rating table available) <1m
 CROSS SECTION WIDTH (m) 7m
 DEPTH (m) <1m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 1</u>	<u>-</u>	<u>Field parameters</u>	<u>only -</u>	



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 2

PROJECT NO: 12584780 DATE: 8/8/22
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 9:40
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER: Fire
 VEGETATION: Overgrown grass/reeds in river
 SLOPE: -
 EROSION: -
 OTHER: _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 10.2 CONDUCTIVITY (uS/cm): 1620
 pH: 7.09 DO (mg/L): 1.8
 REDOX (mV): 129.2 Turbidity (NTU): 60.76
 Sheen, Colour, Odour: Brown, turbid, no odour, no sheen
 Sediment Description: Flowers/moss on surface

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) <1m
 CROSS SECTION WIDTH (m) >1m
 DEPTH (m) <1m
 OTHER: _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>-</u>	<u>Field parameters only</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 3

PROJECT NO. 12584780 DATE: 8/8/22
PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:10
CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Five reeds in pond
VEGETATION Five reeds in pond
SLOPE -
EROSION -
OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C) 10.7 CONDUCTIVITY (µS/cm) 1649
pH 5.94 DO (mg/L) 0.3
REDOX (mV) -123.4 Turbidity (NTU) 2.78
Sheen, Colour, Odour. Brown, turbid, no odour, no sheen.
Sediment Description

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) <1m
CROSS SECTION WIDTH (m) >1m
DEPTH (m) <1m
OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 3</u>	<u>-</u>	<u>Field parameters only</u>	<u>-</u>	



Purging and Sampling Record

Bore ID: MWAIR

Job Information	Sampling Information	Bore Information
Client: Aurizon	Purge Method: MP <u>Peri</u>	SWL(mbTOC): <u>1.55</u> m Logic Check: N/A
Project: TSF Hoxham Compliance Monitoring	Sample Method: MP <u>Peri</u>	Screen: From: N/A m Stick Up:.....m
Proj. No.: 12584780	WQ Meter Type: ProDSS	NAPL Check: <u>NA</u> Bore Diam.: 50 mm
Sampler: LP / <u>SH</u>	Flow Cell: Y Pump Depth: <u>3.5</u>	Ref.datum: TOC Well Cap Secure? <u>N</u>
Date: 1/09/2022	WLevel Meter Type: Dip / Fox / <u>Int.Fce</u> / Gge	Bore Depth: <u>4.38</u> m PID...N/A
Round: <u>September</u>	Field Filtered? <u>Y</u> / <u>N</u> (filter vessel, <u>disposable filter</u> / syringe)	

Time (...Am...)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond. (µS/cm)	Dis. Oxygen (mg/L)	Ox-Red Pt. (±mV)	SWL (m TOC)	NTU	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when 3 consecutive readings			±0.05 pH	±3%	±10%	±10 mV	stable		
8.06	0.5	15.3	5.07	4555	0.20	-39.1	1.65	234.22	light brown (copper/orange flocculant?)
8.08	1.0	14.8	4.90	4263	0.12	-15.4	1.78	82.14	turbid
8.10	1.5	15.1	4.90	439	0.09	-7.5	1.95	64.33	no o/s
8.12	2.0	14.8	4.87	4129	0.02	-9.3	2.05	34.24	
8.14	2.5	14.8	4.88	4120	-0.05*	-17.9	2.20	30.53	
8.16	3.0	15.0	4.89	4140	-0.08*	-39.1	2.35	38.07	same when sampled
8.18	3.5	15.1	5.01	4186	-0.10*	-55.1	2.43	44.10	
8.20	4.0	15.2	5.01	4253	-0.11*	-63.5	2.55	49.52	* DO possibly below calibrated range hence negative reading (17)
									Redox not stabilising SWL
									** readings taken every 2mins

<p>Field QA Checks:</p> <p>Air bubbles in vials? Y / <input checked="" type="checkbox"/> / N</p> <p>Any violent reactions? Y / <input checked="" type="checkbox"/> / N</p> <p>Decontamination as per GHD procedure? <input checked="" type="checkbox"/> / N</p> <p>Was sampling equipment pre-cleaned? <input checked="" type="checkbox"/> / N</p> <p>COC updated? <input checked="" type="checkbox"/> / N</p>	<table border="1"> <thead> <tr> <th>Parameters</th> <th>BTEX</th> <th>TPH</th> <th>PAH</th> <th>CHC</th> <th>PCB</th> <th>OCF</th> <th>OPP</th> <th>Fe²⁺ Metal</th> <th>Micro Biol.</th> <th>Inorganic Bio.</th> <th>Boo.</th> </tr> </thead> <tbody> <tr> <td>Preservatives</td> <td>2</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td>1</td> <td>2</td> <td></td> </tr> </tbody> </table> <p>(preserved)</p>	Parameters	BTEX	TPH	PAH	CHC	PCB	OCF	OPP	Fe ²⁺ Metal	Micro Biol.	Inorganic Bio.	Boo.	Preservatives	2	1						1	1	2	
Parameters	BTEX	TPH	PAH	CHC	PCB	OCF	OPP	Fe ²⁺ Metal	Micro Biol.	Inorganic Bio.	Boo.														
Preservatives	2	1						1	1	2															

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc:

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack



Purging and Sampling Record

Bore ID: MW02

Job Information	Sampling Information	Bore Information
Client: Aurizon	Purge Method: MP <u>Peri</u>	SWL(mbTOC): <u>1.66</u> m Logic Check: N/A
Project: TSF Hexham Compliance Monitoring	Sample Method: MP <u>Peri</u>	Screen: From: N/A m Stick Up:.....m
Proj. No.: 12584780	WQ Meter Type: ProDSS	NAPL Check: <u>N/A</u> Bore Diam.: 50 mm
Sampler: LP / <u>SH</u>	Flow Cell: Y Pump Depth: <u>2</u>	Ref.datum: TOC Well Cap Secure? <u>Y</u>
Date: 1/09/2022	WLevel Meter Type: Dip / Fox <u>Int.Fce</u> / Gge	Bore Depth: <u>2.68</u> m PID...N/A
Round: <u>Sep</u>	Field Filtered? <u>Y</u> / <u>N</u> (filter vessel, <u>disposable filter</u> / syringe)	

Time (... AM)	Volume (L)	Temp (°C)	pH (pH units)	Elec Cond (µS/cm)	Dis. Oxygen (mg/L)	Ox-Red Pt (= mV)	SWL (m TOC)	<u>NTU</u>	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when 3 consecutive readings			±0.05 pH	±3%	±10%	±10 mV	stable		
850	0.5	18.1	5.10	2107	0.58	86.8	1.66	13.15	fast recharge.
852	1.0	18.1	5.06	2065	0.13	83.5	1.66	15.78	clear
854	1.5	18.0	5.04	2043	0.02	81.7	1.66	7.56	colourless
856	2.0	18.0	5.04	2022	-0.05*	79.9	1.66	3.40	no o/s
858	2.5	18.0	5.03	2012	-0.07*	79.1	1.66	6.42	↓
9.00	3.0	18.0	5.03	1997	-0.10*	78.0	1.66	6.66	
9.02	3.5	18.0	5.03	1989	-0.12*	77.1	1.66	6.53	
									same when sampled.
									* DO possibly below calibrated range.
									** readings taken every 2 mins

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N

Decontamination as per GHD procedure? Y / N

Was sampling equipment pre-cleaned? Y / N

COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Ext. Metal	Biotox	inorganic	POD
Preservatives	2	1						1	1	2	1

(if present)

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack



Purging and Sampling Record

Bore ID: MW101R

Job Information		Sampling Information		Bore Information	
Client: Aurizon	Purge Method: MP <u>Peri</u>	SWL(mbTOC): 0.55 0.55 m	Logic Check: N/A	Screen: From: N/A	Stick Up: .....m
Project: TSF Hexham Compliance Monitoring	Sample Method: MP <u>Peri</u>	NAPL Check: <u>NA</u>	Bore Diam.: 50 mm	Ref.datum: TOC	Well Cap Secure? <u>Y</u>
Proj. No.: 12584780	WQ Meter Type: ProDSS	Bore Depth: <u>3.15</u> m	PID: N/A		
Sampler: <u>LP / SH</u>	Flow Cell: Y				
Date: 1/09/2022	Pump Depth: <u>2.8</u>				
Round: <u>September</u>	WLevel Meter Type: Dip / Fox <u>Int.Fce</u> Gge				
	Field Filtered? <u>Y</u> / <u>N</u> (filter vessel, <u>disposable filter/syringe</u>)				

Time (...P.M...)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond (...µS/cm...)	Dis.Oxygen (...mg/L...)	Ox-Red Pt (± mV)	SWL (m TOC)	(...NTU...)	Comment:
Stable when (3 consecutive readings)			+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
107	0.5	16.4	6.23	24191	0.56	-79.6	0.60	780.59	black sediment black sediment / light brown
109	1.0	16.2	6.28	23194	0.15	-163.0	0.60	393.32	slightly turbid
111	1.5	15.7	6.21	20232	0.45	-126.2	0.60	712.80	no o/s.
113	2.0	15.3	6.18	17921	0.60	-101.1	0.60	403.48	fast recharge
115	2.5	15.2	6.18	17336	0.46	-92.7	0.60	261.52	
117	3.0	15.2	6.19	16988	0.44	-86.2	0.60	231.58	
119	3.5	15.2	6.19	16981	0.42	-83.8	0.60	201.72	* reading every 2mins, Vol(L) are estimated.
									less black sediment

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N

Decontamination as per GHD procedure? Y / N

Was sampling equipment pre-cleaned? Y / N

COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Total Metal	Micro Biol.	BOD	Inorganics
Preservatives	2	1						1	1	1	2

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes

Casing Int. Dia (mm) 50 100 150

Vol (L/m of casing) 2.0 7.9 17.7

*Double for gravel pack



Purging and Sampling Record

Bore ID: MW10GR

Job Information		Sampling Information			Bore Information		
Client: Aurizon	Purge Method: MP <u>Peri</u>	SWL(mbTOC): <u>1.50</u> m	Logic Check: N/A	Project: TSF Hexham Compliance Monitoring	Sample Method: MP <u>Peri</u>	Screen: From: N/A m	Stick Up: <u>0.6</u> m
Proj. No.: 12584780	WQ Meter Type: ProDSS	NAPL Check: <u>NO NAPL</u>	Bore Diam.: 50 mm	Sampler: <u>LP/SH</u>	Flow Cell: Y	Pump Depth: —	Well Cap Secure? <u>Yes</u>
Date: 1/09/2022	WL Level Meter Type: Dip / Fox / Int. Fox / Gge	Ref. datum: TOC	PID: N/A	Round: <u>Sept 2022</u>	Field Filtered? <u>Y/N</u> (filter vessel, <u>disposable filter</u> , syringe)	Bore Depth: <u>3.36</u> m	

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond (µS/cm)	Dis. Oxygen (mg/L)	Ox-Red Pt (± mV)	SWL (m TOC)	Stability (N/A)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when 3 consecutive readings			±0.05 pH	±2%	±10%	±10 mV	stable		
10:41	0.5	16.3	6.64	603	0.92	20.8	1.59	151.56	Slightly turbid, clear to slightly brown.
10:43	1.0	16.2	6.63	605	0.64	18.9	1.60	538.47	Small amount of brown sediment, no odour, no sheen.
10:45	1.5	16.2	6.63	612	0.36	-10.0	1.60	443.56	
10:47	2.0	16.2	6.63	609	0.32	2.2	1.60	257.40	
10:49	2.5	16.1	6.63	625	0.35	10.7	1.60	226.80	
10:51	3.0	16.1	6.63	611	0.35	12.0	1.60	112.43	

Field QA Checks:

Air bubbles in vials? Y N Any violent reactions? Y N

Decontamination as per GHD procedure? Y N

Was sampling equipment pre-cleaned? Y N

COC updated? Y N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biot.	Total Purge
Preservatives										B

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc.

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.8 17.7
 *Double for gravel pack



Purging and Sampling Record

Bore ID: MW102R

Job Information	Sampling Information	Bore Information
Client: Aurizon	Purge Method: MP <u>Peri</u>	SWL(mbTOC): <u>2.17</u> m Logic Check: N/A
Project: TSF Hexham Compliance Monitoring	Sample Method: MP <u>Peri</u>	Screen: From: N/A m Stick Up:.....ft
Proj. No.: 12584780	WQ Meter Type: ProDSS	NAPL Check: <u>NA</u> Bore Diam.: 50 mm
Sampler: <u>LPTSH</u>	Flow Cell: Y Pump Depth: <u>~3.5</u>	Ref.datum: TOC Well Cap Secure? <u>y</u>
Date: 1/09/2022	WLevel Meter Type: Dip / Fox <u>(Int.Fce) Gge</u>	Bore Depth: <u>4.05</u> m PID...N/A
Round: <u>September</u>	Field Filtered? <u>Y/N</u> (filter vessel, <u>disposable filter/syringe</u>)	

Time (<u>PM</u>)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond (<u>µS/cm</u>)	Dis.Oxygen (<u>mg/L</u>)	Ox-Red Pt (± mV)	SWL (m TOC)	(<u>NTU</u>)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
30 min when (3 consecutive readings)		-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
1234	0.5	18.0	6.20	2840	5.35	100.3	2.20	72.42	light brown
1236	1.0	17.6	6.16	2828	5.08	115.4	2.21	37.95	slightly turbid
1238	1.5	17.6	6.16	2859	4.53	102.9	2.21	20.32	no d.s.
1240	2.0	17.6	6.16	2872	4.03	96.2	2.21	17.30	fast recharge
1242	2.5	17.6	6.16	2899	3.55	87.3	2.21	15.72	
1244	3.0	17.7	6.16	2959	2.67	70.1	2.21	16.69	
1246	3.5	17.7	6.16	2963	2.49	68.2	2.21	20.52	
1248	4.0	17.6	6.16	2973	2.41	67.5	2.21	16.72	same when sampled

Field QA Checks:

Air bubbles in vials? Y/N Any violent reactions? Y/N

Decontamination as per GHD procedure? Y/N

Was sampling equipment pre-cleaned? Y/N

COC updated? Y/N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Lot. Metal	Biol.	Rad	Insolubles
Preservatives	2	1						1	1	1	2

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc:

Purge Volumes

Casing Int. Dia (mm) 50 100 150

Vol (L/m of casing) 2.0 7.9 17.7

*Double for gravel pack



Purging and Sampling Record

Bore ID: MW109

Job Information		Sampling Information			Bore Information		
Client: Aurizon	Purge Method: MP <u>Peri</u>	SWL(mbTOC): <u>1.84</u> m	Logic Check: N/A				
Project: TSF Hexham Compliance Monitoring	Sample Method: MP <u>Peri</u>	Screen: From: N/A m	Stick Up: <u>0.7</u> m				
Proj. No.: 12584780	WG Meter Type: ProDSS	NAPL Check: <u>NO NAPL</u>	Bore Diam.: 50 mm				
Sampler: <u>LP</u> SH	Flow Cell: Y	Ref.datum: TOC	Well Cap Secure? <u>NO</u>				
Date: 1/09/2022	WL Level Meter Type: Dip / Fox <u>Int.Fce</u> / Gge	Bore Depth: <u>3.43</u> m	PID: N/A				
Round: <u>Sept 2022</u>	Field Filtered? <u>Y</u> / <u>N</u> (filter vessel, <u>disposable filter</u> / syringe)						

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond (.....)	Dis. Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TDC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):			+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
11:50	0.5	17.9	6.75	4719	0.99	-85.2	<u>1.93</u>	17.01	
11:52	1.0	18.0	6.76	4567	0.92	-87.7	2.05	14.55	
11:54	1.5	17.8	6.76	4538	0.36	-95.3	2.15	13.50	
11:56	2.0	17.7	6.75	4534	0.28	-99.0	2.23	19.87	
11:58	2.5	18.0	6.80	4663	0.21	-101.1	2.33	125.40	
12:00	3.0	18.0	6.78	4621	0.16	-102.5	2.42	91.43	
12:02	3.5	18.0	6.77	4574	0.15	-102.9	2.50	81.63	lots of cows surrounding, sample taken.
									Clear, colourless to pale yellow, non-turbid, no sediment, stagnant no sheen, slight Hydrogen sulfide odour

Field QA Checks: Air bubbles in vials? Y <u>N</u> Any violent reactions? Y <u>N</u> Decontamination as per GHD procedure? Y <u>N</u> Was sampling equipment pre-cleaned? Y <u>N</u> COC updated? Y <u>N</u>	<table border="1"> <thead> <tr> <th>Parameters/Preservatives</th> <th>BTEX</th> <th>TPH</th> <th>PAH</th> <th>CHC</th> <th>PCB</th> <th>OCP</th> <th>OPP</th> <th>Tox. Metal</th> <th>Biol.</th> <th>Tox. Buret</th> </tr> </thead> <tbody> <tr> <td></td> <td><u>/</u></td> <td><u>/</u></td> <td><u>/</u></td> <td><u>/</u></td> <td><u>/</u></td> <td><u>/</u></td> <td><u>/</u></td> <td><u>/</u></td> <td><u>/</u></td> <td><u>/</u></td> </tr> </tbody> </table>	Parameters/Preservatives	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tox. Metal	Biol.	Tox. Buret		<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>
Parameters/Preservatives	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tox. Metal	Biol.	Tox. Buret													
	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc
RB01 taken after this sample

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack



Purging and Sampling Record

Bore ID: MW302R

Job Information		Sampling Information			Bore Information	
Client: Aurizon	Purge Method: MP <input checked="" type="radio"/> Peri	SWL(mbTOC): <u>1.33</u> m	Logic Check: N/A	Screen: From: N/A m	Stick Up: <u>0.9</u> m	Bore Diam.: 50 mm
Project: TSF Hexham Compliance Monitoring	Sample Method: MP <input checked="" type="radio"/> Peri	NAPL Check: <u>NO NAPL</u>	Ref.datum: TOC	Well Cap Secure? <u>yes</u>	PID: N/A	
Proj. No.: 12584780	WQ Meter Type: ProDSS	Bore Depth: <u>4.08</u> m				
Sampler: <input checked="" type="radio"/> LP <input type="radio"/> SH	Flow Cell: Y	Pump Depth: —				
Date: 1/09/2022	WLevel Meter Type: Dip / Fox <input checked="" type="radio"/> Int.Fce <input type="radio"/> Gge					
Round: <u>Sept 2022</u>	Field Filtered? <input checked="" type="radio"/> Y <input type="radio"/> N (filter vessel, <input checked="" type="radio"/> disposable filter/syringe)					

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond (µg/L)	Dis. Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	Turbidity (NTU)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
			± 0.05 pH	± 3%	± 10%	± 10 mV	stable		
10:08	0.5	16.3	6.25	3126	0.75	-1.9	1.48	376.01	
10:10	1.0	16.2	6.28	2888	1.25	4.5	1.48	248.99	↑ large jump in parameters, SWL rising
10:12	1.5	15.9	6.41	2390	2.87	11.6	1.45	194.63	
10:14	2.0	15.8	6.46	3107	3.87	13.7	1.45	171.00	↓ gap in SWL (rising)
10:16	2.5	15.6	6.48	1998	4.07	13.2	1.42	150.16	
10:18	3.0	15.6	6.46	1981	3.80	14.3	1.43	175.21	
10:20	3.5	15.7	6.42	2060	3.12	15.7	1.43	175.32	
10:22	4.0	15.7	6.40	2142	2.74	17.4	1.42	208.71	
10:24	4.5	15.7	6.42	2160	3.01	13.7	1.43	175.30	Dark orange, medium amount of orange sediment, no sheen, no odour, moderately turbid

Field QA Checks:

Air bubbles in vials? Y N Any violent reactions? Y N

Decontamination as per GHD procedure? Y N

Was sampling equipment pre-cleaned? Y N

COC updated? Y N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.	Total Arsenic
Preservatives	/	/	/	/	/	/	/	/	/	/

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc:
FDO1 + FDO2

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack



Purging and Sampling Record

Bore ID: MU307R

Job Information		Sampling Information			Bore Information		
Client: Aurizon	Purge Method: MP <u>Peri</u>	SWL(mbTOC): <u>1.39</u> m	Logic Check: N/A				
Project: TSF Hextram Compliance Monitoring	Sample Method: MP <u>Peri</u>	Screen: From: N/A m	Stick Up: .....m				
Proj. No.: 12584780	WQ Meter Type: ProDSS	NAPL Check: <u>NA</u>	Bore Diam.: 50 mm				
Sampler: <u>LF/SA</u>	Flow Cell: Y	Pump Depth: <u>5</u>	Well Cap Secure? <u>N</u>				
Date: 1/09/2022	WLevel Meter Type: Dip / Fox <u>Int. Fse</u> / Gpe	Ref. datum: TOC	Bore Depth: <u>6.04</u> m				
Round: <u>September</u>	Field Filtered? <u>Y/N</u> (filter vessel, <u>disposable filter</u> / syringe)						

Time (AM)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond. (µS/cm)	Dis. Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	NTU	Comment: Colour, turbidity, sediment load, shaen, odour, flow rate, purged dry?
Stable when consecutive readings:			+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
1030	0.5	18.4	7.13	23852	0.83	-131.9	2.00	9.00	clear / colourless pale yellow * readings every 2 mins
1032	1.0	18.4	7.06	23860	0.64	-149.3	2.50	9.08	no ds.
1034	1.5	18.6	7.06	26993	3.87	-157.8	2.75	404.99*	
1038	2.0	18.0	7.05	27055	0.41	-129.0	3.01	6.57	
1041	2.5	17.8	7.05	26894	0.03	-128.7	3.15	6.03	* started to pump bubbles, stopped and restarted
1044	3.0	17.7	7.04	26566	-0.05	-125.2	3.20	2.40	lowered speed control, readings every 3 mins
1047	3.5	18.0	7.05	26728	-0.08	-120.8	3.35	2.31	
1050	4.0	18.0	7.05	26668	-0.11	-118.6	3.41	2.60	SWL not stabilising
									check same when sampled.

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N

Decontamination as per GHD procedure? Y/N

Was sampling equipment pre-cleaned? Y/N

COC updated? Y/N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Fet. Metal	Micro Biol.	BOD	Iron	As
Preservatives	2	1						1	1	1	2	

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack.



Purging and Sampling Record

Bore ID: MW308R

Job Information		Sampling Information			Bore Information		
Client: Aurizon	Purge Method: MP <input checked="" type="radio"/> Peri	SWL(mbTOC): <u>0.87</u> m	Logic Check: N/A	Sample Method: MP <input checked="" type="radio"/> Peri	Screen: From: N/A m	Stick Up: .....m	
Project: TSF Hexham Compliance Monitoring	WQ Meter Type: ProDSS	NAPL Check: <u>NA</u>	Bore Diam.: 50 mm	Flow Cell: Y	Pump Depth: <u>3</u>	Well Cap Secure? <input checked="" type="radio"/> N	
Proj. No.: 12584780	WLevel Meter Type: Dip / Fox <input checked="" type="radio"/> Int.Fce <input checked="" type="radio"/> Gge	Bore Depth: <u>3.93*</u> m	PID: N/A	Date: 1/09/2022	Field Filtered? <input checked="" type="radio"/> Y / <input type="radio"/> N (filler vessel, <input checked="" type="radio"/> disposable filter/syringe)		
Sampler: LP / <input checked="" type="radio"/> SH				Round: <u>SEP</u>			

*Time (MM)	*Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond. (µS/cm)	Dis. Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	NTU	Comment:
Stable when 2 consecutive readings									
945	0.5	16.4	6.24	5704	0.62	-61.2	1.10	57.60	* Roots in well - may need to be cleared before next AME, bore depth may be deeper
947	1.0	15.6	6.18	5476	0.08	-63.7	1.30	33.97	
949	1.5	15.3	6.13	5039	0.01	-60.9	1.52	48.98	
951	2.0	15.0	6.05	4335	-0.06***	-55.1	1.66	99.91	*** took reading every 2 mins - vol (L) is only estimate - based on past readings
953	2.5	14.7	6.02	3405	-0.03***	-43.5	1.78	79.82	
955	3.0	14.6	5.99	3251	0.07	-41.4	1.91	65.76	colourless/light brown → colourless at end. slightly turbid → less turbid after ~35L purged no o/s
957	3.5	14.6	6.01	3437	0.05	-46.9	2.02	89.71	
959	4.0	14.7	6.01	3319	0.03	-49.9	2.14	78.53	
									*** DO possibly below calibrated range.
									NTU fluctuating, SWL not stabilising

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N

Decontamination as per GHD procedure? Y / N

Was sampling equipment pre-cleaned? Y / N

COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Mer Biol.	Isopropyl	Geo
Preservatives	2	1						1	1	2	1

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc.

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 1

PROJECT NO. 12584780 DATE: 01/09/2022
PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 11:20
CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
VEGETATION reeds along bank of pond
SLOPE =
EROSION
OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C) 15.8 CONDUCTIVITY (µS/cm) 806
pH 7.07 DO (mg/L) 0.51
REDOX (mV) -114.0 Turbidity (NTU) 239.64

Sheen, Colour, Odour: clear, colourless, swampy/hydrogen sulfide odour

Sediment Description: fine Duck weed on surface, light bacterial sheen.
Small amount of vegetation/sediment

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) cm/min
CROSS SECTION WIDTH (m) >1m
DEPTH (m) >1m
OTHER

SAMPLE NO	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 1</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>AT ABOVE</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 2

PROJECT NO. 12584780 DATE: 01/09/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 07:20
 CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (If Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION Reeds in pool, overgrown grass along Bank, moss/rock weed
~~SCAPE~~ on water surface
~~EROSION~~ _____
~~OTHER~~ _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 13.2 CONDUCTIVITY (µS/cm): 1760
 pH: 6.91 DO (mg/L): 1.06
 REDOX (mV): 17.4 Turbidity (NTU): 46.45
 Sheen, Colour, Odour: Slightly Brown to clear, Slightly turbid, Dirt and
 Sediment Description: orange sediment, no odour, no sheen

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) < 1m/min
 CROSS SECTION WIDTH (m) 2m
 DEPTH (m) < 1m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>As above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 3

PROJECT NO. 12584780 DATE: 01/09/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 12:30
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine, Sunny
 VEGETATION along bank - reeds, some duck weed on surface/moss
 SLOPE -
 EROSION -
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 16.1 CONDUCTIVITY (uS/cm): 1372
 pH: 6.46 DO (mg/L): 9.78
 REDOX (mV): -9.4 Turbidity (NTU): 318.60
 Sheen, Colour, Odour: clear, colourless, non-turbid, no odour, no sheen

~~Sediment Description~~ _____

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) dm/min
 CROSS SECTION WIDTH (m) 7m
 DEPTH (m) 1m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 3</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>As above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW9

PROJECT NO: 12584780 DATE: 01/09/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 14:20
 CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER: Fine
 VEGETATION: none (pipe discharging into Hunter River)
 SLOPE: -
 EROSION: -
 OTHER:

FIELD MEASUREMENTS

TEMPERATURE (°C): 16.7 CONDUCTIVITY (uS/cm): 9376
 pH: 7.48 DO (mg/L): 8.26
 REDOX (mV): 28.9 Turbidity (NTU): 1653.77
 Sheen, Colour, Odour: slightly turbid
 Sediment Description: pale yellow
no o/s

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) >1m
 CROSS SECTION WIDTH (m) >1m
 DEPTH (m) >1m
 OTHER:

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW9</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>AS ABOVE</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 1

PROJECT NO. 12584760 DATE: 11/10/2022
 PROJECT NAME: Aurizon TSP Hazchem Monitoring TIME: 11:45
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES (GPS (if applicable)) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS
 WEATHER Overcast
 VEGETATION Reeds in pond, vegetation and flowers? on surface
 SLOPE -
 EROSION -
 OTHER _____

FIELD MEASUREMENTS
 TEMPERATURE (°C) 16.8 CONDUCTIVITY (µS/cm) 700
 pH 7.02 DO (mg/L) -68.00
 REDOX (mV) -68.1 Turbidity (NTU) 35.11
 Sheen Colour Odour very slight bacterial sheen, mild hydrogen sulfide odour,
 Sediment Description pale yellow, slightly turbid, trace vegetation

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available) cm/min
 CROSS SECTION WIDTH (m) 2m
 DEPTH (m) 1m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 1</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>as above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... Basin 2

PROJECT NO.:	<u>12584780</u>	DATE:	<u>11/10/2022</u>
PROJECT NAME:	<u>Arizona TSF Hexham Monitoring</u>	TIME:	<u>07:50</u>
CLIENT:	<u>Arizona</u>	SAMPLING OFFICER:	<u>LP</u>

COORDINATES/GPS (if applicable) _____

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine

VEGETATION Reeds, grass, flowers in pond. Ducks waded on surface

SLOPE -

EROSION -

OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C)	<u>15.2</u>	CONDUCTIVITY (µS/cm)	<u>781</u>
pH	<u>6.77</u>	DO (mg/L)	<u>-62.24</u>
BEDOX (mV)	<u>-77.2</u>	Turbidity (NTU)	<u>25.12</u>

Spec. Color, Odour, No spec, Mild Hydrox sulfide/sulfur, odour

Sediment Description: clear to muddy brown, lots of vegetation, weeds and algae, slightly turbid

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) <1m³

CROSSSECTION WIDTH (m) 1m

DEPTH (m) 1m

OTHER -

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>as above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID Basin 3

PROJECT NO: 12584780 DATE: 11/10/2022
 PROJECT NAME: Aurizon TSF Heatham Monitoring TIME: 08:45
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION long reeds in pond
 SLOPE -
 EROSION -
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C) 15.7 CONDUCTIVITY (uS/cm) 1516
 pH 6.11 DO (mg/L) 67.04
 REDOX (mV) 87.4 Turbidity (NTU) 356.02
 Sheen, Colour, Odour Mulky Brown to clear, slightly turbid, mild hydrogen
 Sediment Description Sulfide odour, no sheen, lots of Duck weed on
Surface

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) <1m
 CROSS SECTION WIDTH (m) <1m
 DEPTH (m) <1m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 3</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>as above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... Sw1

PROJECT NO. 12584780 DATE: 11/10/2022
 PROJECT NAME: Aurizon TSF Hextam Monitoring TIME: 12:20
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (If Applicable) _____
 SAMPLING METHOD (is grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Overcast
 VEGETATION grass either side of stream
 SLOPE -
 EROSION -
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 17.4 CONDUCTIVITY (µS/cm) 755
 pH: 6.86 DO (mg/L) -35.83
 REDOX (mV) 56.3 Turbidity (NTU) 166.63
 Sheen, Colour, Odour _____
 Sediment Description pale Brown, slightly turbid, some vegetation and Black sediment, No odour, No sheen

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) < 1m/min
 CROSS SECTION WIDTH (m) > 1m
 DEPTH (m) > 1m
 OTHER -

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Sw1</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>at above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW2

PROJECT NO. 12584780 DATE: 11/10/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 10:50
 CLIENT: Aurizon SAMPLING OFFICER: LP

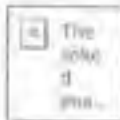
COORDINATES/GPS (if applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS
 WEATHER overcast
 VEGETATION grass on bank
 SLOPE -
 EROSION -
 OTHER _____

FIELD MEASUREMENTS
 TEMPERATURE (°C) 19.3 CONDUCTIVITY (uS/cm) 693
 pH 7.37 DO (mg/L) 9.78
 REDOX (mV) 30.8 Turbidity (NTU) 61.51
 Shear, Colour, Odour: pale yellow, vegetation in water, spotted Bacterial
 Sediment Description: stream, no colour, slightly turbid

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available) <1m/min
 CROSS SECTION WIDTH (m) 7m
 DEPTH (m) <1m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW2</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>as above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW3

PROJECT NO. 12584780 DATE: 11/16/2022
 PROJECT NAME: Aurizon TSF Heaham Monitoring TIME: 10:20
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if applicable) _____
 SAMPLING METHOD (is grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER overcast
 VEGETATION no short grass, moss/flowers floating on pond
 SLOPE -
 EROSION -
 OTHER _____

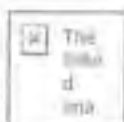
FIELD MEASUREMENTS

TEMPERATURE (°C) 17.0 CONDUCTIVITY (µS/cm) 1000
 pH 7.10 DO (mg/L) -63.59
 REDOX (mV) -123.7 Turbidity (NTU) 175.39
 Ehem, Color, Odour, _____
 Sediment Description no silt, no odour, light brown, organic matter/vegetation in water samples, slightly turbid

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) cm/min
 CROSS SECTION WIDTH (m) 3m
 DEPTH (m) 1m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW3</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>as above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID... SW4

PROJECT NO. 12584780 DATE: 11/10/2022
PROJECT NAME: Aurizon TSF Hoxham Monitoring TIME: 09:40
CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if applicable) _____
SAMPLING METHOD (ie grab, bucket) Grab
DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Overcast
VEGETATION grass on outside of pond, lots of floating leaves?
~~SLOPE~~ on surface _____
EROSION _____
OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C) 15.7 CONDUCTIVITY (µS/cm) 2235
pH 6.98 DO (mg/L) 69.96
REDOX (mV) -179.8 Turbidity (NTU) 412.38
Green, Colour, Odour. no green, no odour, clear, colourless, non-turbid,
Sediment Description: Small amount of black sediment

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) cm/min
CROSS SECTION WIDTH (m) 7m
DEPTH (m) 1m
OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW4</u>	<u>ICE-8</u>	<u>ICE</u>	<u>-</u>	<u>a) above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW4A

PROJECT NO. 12584780 DATE: 11/10/2022
 PROJECT NAME: Aurizon TSE Hexham Monitoring TIME: 09:50
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (if grab bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER: overcast
 VEGETATION: grass and cat-tail reeds in pond
 SLOPE: _____
 EROSION: _____
 OTHER: _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 15.8 CONDUCTIVITY (µS/cm): 2230
 pH: 7.14 DO (mg/L): -69.13
 REDOX (mV): -164.0 Turbidity (NTU): 523.84

Sheen, Colour, Odour: no sheen, ~~strong~~ odour lots of flowers? on surface
 Sediment Description: lots of Black sediment/dirt, light Black, slightly turbid
no odour

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) cm/min
 CROSS SECTION WIDTH (m) 2m
 DEPTH (m) 2m
 OTHER: _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW4A</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>as above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW5

PROJECT NO. 12584780 DATE: 11/10/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 08:30
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES(GPS (If Applicable)) _____
 SAMPLING METHOD (is grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION Reeds in pond,
 SLOPE -
 EROSION -
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C) 15.3 CONDUCTIVITY (uS/cm) 1414
 pH 6.15 DO (mg/L) -71.08
 REDOX (mV) -57.2 Turbidity (NTU) 236.02

Smell, Colour, Odour, _____
 Sediment Description thin/broken bacterial sludge, no odour, lots of orange slimy sediment/algal mass on surface, very turbid, dark orange with heavy algal load.

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) cm/min
 CROSS SECTION WIDTH (m) 7m
 DEPTH (m) 1m
 OTHER -

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW5</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>as above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW6

PROJECT NO. 125B4780 DATE: 11/10/2022
 PROJECT NAME: Aurizon TSF Hexflam Monitoring TIME: 09:20
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (If Applicable) _____
 SAMPLING METHOD (w/ grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER: Fine
 VEGETATION: Reeds in pond, grass surrounding culvert
 SLOPE: -
 EROSION: -
 OTHER: _____

FIELD MEASUREMENTS

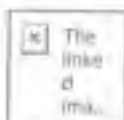
TEMPERATURE (°C) 16.1 CONDUCTIVITY (uS/cm) 1295
 pH 6.54 DO (mg/L) -57.85
 REDOX (mV) -58.6 Turbidity (NTU) 8.99

Sheen, Colour, Odour: thin bacterial sheen in parts, mild Hydrogen sulfide odour, thick algal mass in parts, pale orange with orange algae in medium amounts, moderately turbid
 Sediment Description: _____

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) <1m/min
 CROSS SECTION WIDTH (m) <1m
 DEPTH (m) <1m
 OTHER: _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW6</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>as above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW7

PROJECT NO. 12564780 DATE: 11/10/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 08:20
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

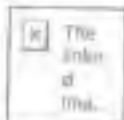
ENVIRONMENTAL OBSERVATIONS
 WEATHER Fine
 VEGETATION grass in road
 SLOPE -
 EROSION -
 OTHER _____

FIELD MEASUREMENTS
 TEMPERATURE (°C): 16.5 CONDUCTIVITY (µS/cm): 1790
 pH: 5.35 DO (mg/L): -58.37
 REDOX (mV): 38.7 Turbidity (NTU): 3.90

Stream Colour, Odour: thin/Solid Bacterial sheen on surface, clear, colourless,
 Sediment Description: non-turbid, moderate Hydrogen sulfide odour,

HYDROLOGICAL DATA
 FLOW MEASUREMENT (or stream height if rating table available) <1m/min
 CROSS SECTION WIDTH (m) <1m
 DEPTH (m) <1m
 OTHER -

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW7</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>as above</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW8

PROJECT NO. 12584780 DATE: 11/10/2022
 PROJECT NAME: Arizona TSF Haskam Monitoring TIME:
 CLIENT: Arizona SAMPLING OFFICER: LP
 COORDINATES/GPS (if Available)
 SAMPLING METHOD (in grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER
 VEGETATION
 SLOPE
 EROSION
 OTHER

FLOODED BY HUNTER RIVER

FIELD MEASUREMENTS

TEMPERATURE (°C) CONDUCTIVITY (µS/cm)
 pH DO (mg/L)
 REDOX (mV) Turbidity (NTU)
 Sheen, Colour, Odour.
 Sediment Description:

HYDROLOGICAL DATA

FLOW MEASUREMENT
 (or Stream height if rating table available)
 CROSS SECTION WIDTH (m)
 DEPTH (m)
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW9

PROJECT NO. 12584780 DATE: 11/10/2022
PROJECT NAME: Arizon TSE Hexham Monitoring TIME: _____
CLIENT: Arizon SAMPLING OFFICER: GP

COORDINATES/GPS (If Applicable) _____
SAMPLING METHOD (ie grab, bucket) Grab
DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER _____
VEGETATION _____
SLOPE _____
EROSION _____
OTHER _____

FLOODED BY
HUNTER RIVER

FIELD MEASUREMENTS

TEMPERATURE (°C) _____ CONDUCTIVITY (µS/cm) _____
pH _____ DO (mg/l) _____
REDOX (mV) _____ Turbidity (NTU) _____
Shim: Colour, Odour _____
Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT
(or stream height if rating table available) _____
CROSS SECTION WIDTH (m) _____
DEPTH (m) _____
OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: SW10

PROJECT NO: 12584760 DATE: 11/10/2022
PROJECT NAME: Aurizon TSP Hexham Monitoring TIME: _____
CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if Applicable) _____
SAMPLING METHOD (in grab, bucket) Grab
DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER _____
VEGETATION _____
SLOPE _____
EROSION _____
OTHER _____

DRY

FIELD MEASUREMENTS

TEMPERATURE (°C) _____ CONDUCTIVITY (µS/cm) _____
pH _____ DO (mg/L) _____
REDOX (mV) _____ Turbidity (NTU) _____
Stream Colour, Odour _____
Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) _____
CROSS SECTION WIDTH (m) _____
DEPTH (m) _____
OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DURPLICATE	COMMENTS



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID SW11

PROJECT NO. 12584780 DATE: 11/10/2022
PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 11:10
CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER overcast
VEGETATION grass on bank
SLOPE -
EROSION -
OTHER

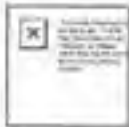
FIELD MEASUREMENTS

TEMPERATURE (°C): 18.0 CONDUCTIVITY (µS/cm) 648
pH: 6.95 DO (mg/L) -24.65
REDOX (mV): 55.0 Turbidity (NTU) 42.94
Sheen, Colour, Odour: pale yellow, No sheen, No odour,
Sediment Description: leaves on surface, slightly turbid

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) < 1m³/min
CROSS SECTION WIDTH (m) > 1m
DEPTH (m) > 1m
OTHER -

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>SW11</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>or 9502</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 1

PROJECT NO: 12584780 DATE: 17/10/22
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 13:30
 CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (*if Applicable*) _____
 SAMPLING METHOD (*ie grab, bucket*) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER overcast
 VEGETATION reeds in pond and on Bank
 SLOPE _____
 EROSION _____
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 19.3 CONDUCTIVITY (µS/cm) 735
 pH: 6.84 DO (mg/L) 1.13
 REDOX (mV): -124.3 Turbidity (NTU) 9.23
 Sheen, Colour, Odour. No odour, no sheen, Brown, turbid, Dark
 Sediment Description weed on surface

HYDROLOGICAL DATA

FLOW MEASUREMENT
 (or stream height if rating table available) 2m/min (windy)
 CROSS SECTION WIDTH (m) 2m
 DEPTH (m) 2m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 1</u>	<u>-</u>	<u>-</u>	<u>field parameters only</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 2

PROJECT NO: 12584780 DATE: 17/10/22
PROJECT NAME: Aurizon TSF Haxham Monitoring TIME: 12:45
CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER overcast
VEGETATION grass, reeds and vegetation in pond
SLOPE -
EROSION -
OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 17.4 CONDUCTIVITY (µS/cm): 1149
pH: 6.41 DO (mg/L): 1.40
REDOX (mV): 120.4 Turbidity (NTU): 18.22
Sheen, Colour, Odour: No odour, No sheen, Duck weed on surface,
Sediment Description: Brown, turbid.

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) 2m/min (windy)
CROSS SECTION WIDTH (m) 2m
DEPTH (m) 1m
OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>-</u>	<u>-</u>	<u>field parameters only</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 3

PROJECT NO. 12584780 DATE: 17/10/22
 PROJECT NAME: Aurizon TSF Haxham Monitoring TIME: 13:10
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER overcast
 VEGETATION reeds in pond, Duck weed on surface of pond
 SLOPE -
 EROSION -
 OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C): 17.4 CONDUCTIVITY (uS/cm): 1974
 pH: 5.68 DO (mg/L): 0.45
 REDOX (mV): 114.1 Turbidity (NTU): 2.50
 Sheen, Colour, Odour: No odour, No sheen, Brown, turbid, Duck weed covering surface
 Sediment Description

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) km/min (windy)
 CROSS SECTION WIDTH (m) km
 DEPTH (m) <1m
 OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 3</u>	<u>-</u>	<u>-</u>	<u>field parameters only</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID Basin 1

PROJECT NO. 12584780 DATE: 3/11/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 12:40
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (If Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION Reeds along bank, trace duck weed on surface
 SLOPE -
 EROSION -
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 17.2 CONDUCTIVITY (uS/cm): 858
 pH: 7.14 DO (mg/L): 2.06
 REDOX (mV): -43.4 Turbidity (NTU): 13.14
 Sheen, Colour, Odour: Brown, turbid, no sheen, no odour
 Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) < 1m/min
 CROSS SECTION WIDTH (m) < 1m
 DEPTH (m) < 1m
 OTHER _____

SAMPLE NO	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 1</u>	<u>-</u>	<u>Field parameters only</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID..... Basin 2

PROJECT NO. 12584780 DATE: 3/11/2022
PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 11:40
CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
VEGETATION along Bank, dense weed on water surface
SLOPE -
EROSION -
OTHER

FIELD MEASUREMENTS

TEMPERATURE (°C) 15.6 CONDUCTIVITY (µS/cm) 1835
pH 6.68 DO (mg/L) 0.03
REDOX (mV) -145.0 Turbidity (NTU) 140.83
Sheen, Colour, Odour Brown, turbid, no odour, no sheen
Sediment Description -

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) <1m/min (stagnant)
CROSS SECTION WIDTH (m) <1m
DEPTH (m) <1m
OTHER

SAMPLE NO	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 2</u>	<u>-</u>	<u>field parameter</u>	<u>only</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 3

PROJECT NO. 12584780 DATE: 3/11/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 12:20
 CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (If Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Fine
 VEGETATION reeds on bank, duck weed on water surface
 SLOPE -
 EROSION -
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C) 15.4 CONDUCTIVITY (uS/cm) 2030
 pH 6.26 DO (mg/L) 1.20
 REDOX (mV) -77.4 Turbidity (NTU) 9.20
 Sheen, Colour, Odour, Brown, turbid, no odour, no sheen
 Sediment Description _____

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) _____ cm/min
 CROSS SECTION WIDTH (m) _____ cm
 DEPTH (m) _____ cm
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 3</u>	<u>-</u>	<u>field parameter</u>	<u>only</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID: Basin 1

PROJECT NO.:	<u>12584780</u>	DATE:	<u>7/12/2022</u>
PROJECT NAME:	<u>Aurizon TSF Hexham Monitoring</u>	TIME:	<u>12:00</u>
CLIENT:	<u>Aurizon</u>	SAMPLING OFFICER:	<u>LP</u>

COORDINATES/GPS (if Applicable) _____

SAMPLING METHOD (ie grab, bucket) Grab

DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Overcast + windy

VEGETATION Reeds in pond

SLOPE -

EROSION -

OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C)	<u>23.5</u>	CONDUCTIVITY (uS/cm)	<u>1198</u>
pH	<u>7.55</u>	DO (mg/L)	<u>0.44</u>
REDOX (mV)	<u>-264.3</u>	Turbidity (NTU)	<u>1299</u>

Sheen, Colour, Odour, thick algal mat on surface, duck weed and

Sediment Description organic matter, dark brown, very turbid, lots of organic matter in sample High Hydrogen Sulfide odour. - Stagnant water -

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) 4m/min

CROSS SECTION WIDTH (m) 7m

DEPTH (m) 4m

OTHER -

SAMPLE NO	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 1</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID Basin 2

PROJECT NO. 12584780 DATE: 7/12/2022
 PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 07:30
 CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable)

SAMPLING METHOD (ie grab, bucket)

Grab

DETAILED SAMPLE LOCATION DESCRIPTION

ENVIRONMENTAL OBSERVATIONS

WEATHER

VEGETATION

SLOPE

EROSION

OTHER

DRY

FIELD MEASUREMENTS

TEMPERATURE (°C)

CONDUCTIVITY (uS/cm)

pH

DO (mg/L)

REDOX (mV)

Turbidity (NTU)

Sheen, Colour, Odour

Sediment Description

HYDROLOGICAL DATA

FLOW MEASUREMENT

(or stream height if rating table available)

CROSS SECTION WIDTH (m)

DEPTH (m)

OTHER

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
				<u>DRY - OVERGROWN REEDS/GRASS / VEGETATION</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID Basin 3

PROJECT NO. 12584780 DATE: 8/12/2022
PROJECT NAME: Aurizon TSF Hexham Monitoring TIME: 08:00
CLIENT: Aurizon SAMPLING OFFICER: LP

COORDINATES/GPS (if Applicable) _____
SAMPLING METHOD (ie grab, bucket) Grab
DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS
WEATHER Fine
VEGETATION Reeds on Bank
SLOPE _____
EROSION -
OTHER _____

FIELD MEASUREMENTS
TEMPERATURE (°C): 17.3 CONDUCTIVITY (uS/cm) 2302
pH: 7.48 DO (mg/L) 0.00
REDOX (mV): -344.9 Turbidity (NTU) 155.05
Sheen, Colour, Odour: clear, colourless, no odour, no sheen
Sediment Description: dark wood on surface, organic matter in water

HYDROLOGICAL DATA
FLOW MEASUREMENT (or stream height if rating table available) <1m³/min
CROSS SECTION WIDTH (m) 7m
DEPTH (m) <1m
OTHER _____

SAMPLE NO	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>Basin 3</u>	<u>8</u>	<u>ICG</u>	<u>-</u>	<u>-</u>



SURFACE WATER & SEDIMENT SAMPLING RECORD

Location ID sw9

PROJECT NO. 12584780 DATE: 7/12/2022
 PROJECT NAME: Aurizon TSF Hextram Monitoring TIME: 13:30
 CLIENT: Aurizon SAMPLING OFFICER: CP

COORDINATES/GPS (if Applicable) _____
 SAMPLING METHOD (ie grab, bucket) Grab
 DETAILED SAMPLE LOCATION DESCRIPTION _____

ENVIRONMENTAL OBSERVATIONS

WEATHER Overcast
 VEGETATION -
 SLOPE -
 EROSION -
 OTHER _____

FIELD MEASUREMENTS

TEMPERATURE (°C): 22.2 CONDUCTIVITY (µS/cm): 26254
 pH: 7.57 DO (mg/L): 6.77
 REDOX (mV): 68.8 Turbidity (NTU): 12.68
 Sheen, Colour, Odour: clear, colourless, odourless, no sheen
 Sediment Description: No sediment, non-turbid

HYDROLOGICAL DATA

FLOW MEASUREMENT (or stream height if rating table available) 7m (out of pipe)
 CROSS SECTION WIDTH (m) 7m
 DEPTH (m) 7m
 OTHER _____

SAMPLE NO.	NO. OF CONTAINERS	PRESERVATIVE	DUPLICATE	COMMENTS
<u>sw9</u>	<u>8</u>	<u>ICE</u>	<u>-</u>	<u>-</u>



Purging and Sampling Record

Bore ID: 101R

Job Information	Sampling Information	Bore Information
Client: Aurizon	Purge Method: MP <u>Peri</u>	SWL(mbTOC): <u>1.99</u> m Logic Check: N/A
Project: TSF Hexham Compliance Monitoring	Sample Method: MP <u>Peri</u>	Screen: From: N/A m Stick Up:.....m
Proj. No.: 12584780	WQ Meter Type: ProDSS	NAPL Check:..... Bore Diam.: 50 mm
Sampler: <u>LP/SH</u>	Flow Cell: Y Pump Depth: ----	Ref.datum: TOC Well Cap Secure? <u>Yes</u>
Date: <u>7/12/2022</u>	WLevel Meter Type: Dip / Fox <u>(Int.Fce) Gge</u>	Bore Depth: <u>5.46</u> m PID...N/A
Round: <u>Q4</u>	Field Filtered? <u>Y/N</u> (filter vessel, <u>disposable filter/syringe</u>)	

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond (µS/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	Turbidity (.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings)			± 0.05 pH	± 3%	± 10%	± 10 mV	stable		
08:20	0.5	19.7	7.67	7814	0.30	-64.1	2.29	82.77	Slightly orange, cloudy, moderately turbid, no sediment, no sheen, no odour.
08:23	1.0	19.8	7.49	7792	0.15	-64.5	2.39	101.26	
08:26	1.5	19.8	7.41	7770	0.15	-64.5	2.44	87.66	
08:29	2.0	19.8	7.32	7682	0.07	-62.2	2.49	105.80	
08:32	2.5	19.8	7.27	7677	0.03	-62.1	2.54	134.98	
08:36	3.0	19.9	7.23	7640	0.02	-60.4	2.58	171.70	
08:39	3.5	19.9	7.24	7692	0.01	-60.1	2.63	214.18	

Field QA Checks: Air bubbles in vials? Y <u>(N)</u> Any violent reactions? Y <u>(N)</u> Decontamination as per GHD procedure? <u>Y/N</u> Was sampling equipment pre-cleaned? <u>Y/N</u> COC updated? <u>Y/N</u>	<table border="1"> <thead> <tr> <th>Parameters</th> <th>BTEX</th> <th>TPH</th> <th>PAH</th> <th>CHC</th> <th>PCB</th> <th>OCP</th> <th>OPP</th> <th>Tot. Metal</th> <th>Biol.</th> <th>Chl a (µg/L)</th> <th> </th> <th> </th> <th> </th> </tr> </thead> <tbody> <tr> <td>Preservations</td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td>8</td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.	Chl a (µg/L)				Preservations										8			
Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.	Chl a (µg/L)																			
Preservations										8																			

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc.

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack



Purging and Sampling Record

Bore ID: MW302R

Job Information		Sampling Information		Bore Information	
Client: Aurizon		Purge Method: MP <u>Peri</u>	SWL(mbTOC): <u>1.55</u> m		Logic Check: N/A
Project: TSF Hisham Compliance Monitoring		Sample Method: MP <u>Peri</u>	Screen: From: N/A m		Stick Up: .....m
Proj. No.: 12584780		WQ Meter Type: ProDSS	NAPL Check:.....		Bore Diam.: 50 mm
Sampler: <u>LP7SH</u>		Flow Cell: Y	Ref.datum: TOC		Well Cap Secure? <u>Yes</u>
Date: 7/12/2022		Pump Depth: —	Bore Depth: <u>4.01</u> m		PID...N/A
Round: <u>Q4</u>		WLevel Meter Type: Dip / Fox / Int.Fce / Gge	Field Filtered? <u>Y/N</u> (filter vessel, disposable filter/syringe)		

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec. Cond (µS/cm)	Dis. Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	Turbidity (.....)	Comment:
			± 0.05 pH	± 3%	± 10%	± 10 mV	± 0.01		Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
08:50	0.5	18.4	7.42	3003	0.25	-32.5	1.71	215.63	No odour, no sheen, milky brown slightly turbid, no sediment.
08:53	1.0	18.5	7.10	2948	0.08	-36.3	1.74	172.39	
08:56	1.5	18.5	6.97	2483	0.04	-39.3	1.75	237.61	
08:59	2.0	18.6	6.88	2408	0.00	-42.1	1.75	220.54	
09:02	2.5	18.7	6.82	2720	0.00	-42.2	1.75	184.50	
09:05	3.0	18.7	6.83	2584	0.00	-44.8	1.75	434.88	
09:08	3.5	18.8	6.84	2352	0.00	-51.0	1.75	377.80	
09:11	4.0	18.8	6.84	2232	0.00	-52.4	1.75	255.61	
09:14	4.5	18.8	6.84	2127	0.00	-55.8	1.75	156.53	
									* WSM 10-ml for D.O. after this sample
									D.O. also taken by lab
									* Conductivity constantly dropping, 10-ml after this sample but likely this location is causing the values.

Field QA Checks:

Air bubbles in vials? Y N Any violent reactions? Y N
 Decontamination as per GHD procedure? Y N
 Was sampling equipment pre-cleaned? Y N
 COC updated? Y N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.	Total Solids
Preservations										8

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc.

+FD01 + FD02

Purge Volumes
 Casing Int. Dia (mm) 50 100 150
 Vol (L/m of casing) 2.0 7.9 17.7
 *Double for gravel pack

Appendix G

Calibration certificates

Instrument **YSI Pro DSS**
 Serial No **15J101503**



Air-Met Scientific Pty Ltd
 1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation	✓	
	Segments	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O.	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 10.00		pH 10.00		378848	pH 10.00
2. pH 7.00		pH 7.00		377339	pH 7.07
3. pH 4.00		pH 4.00		380327	pH 3.94
4. mV		234.0mV		365451/374424	232.0mV
5. EC		2.76mS		377099	2.75mS
6. D.O.		0.00ppm		371884	0.00ppm
7. Turbidity		50 NTU		374601	51.0NTU
8. Temp		22.0C		MultiTherm	20.2°C

Calibrated by:

Evan Weller

Calibration date:

14/03/2022

Next calibration due:

10/09/2022



Multi Parameter Water Meter

Instrument YSI Pro DSS
 Serial No. 15J101503



Air-Met Scientific Pty Ltd
 1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
	Intensity	✓	
Display	Operation	✓	
	(segments)		
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
	Sensor	✓	
	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 10.00		pH 10.00		378646	pH 9.73
2. pH 7.00		pH 7.00		377339	pH 7.00
3. pH 4.00		pH 4.00		380327	pH 3.96
4. mV		231.8mV		365451/374424	231.1mV
5. EC		2.76mS		377099	2.75mS
6. D.O		0.00ppm		371864	0.04pm
7. Turbidity		50 NTU		374601	52.5NTU
8. Temp		21°C		MultiTherm	21.3°C

Calibrated by:

Sarah Lian

Calibration date:

18/02/2022

Next calibration due:

17/08/2022

Multi Parameter Water Meter



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument **YSI Quatro Pro Plus**
Serial No. **20M101180**

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad Display	Operation	✓	
	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 10.00		pH 10.00		370064	pH 9.91
2. pH 7.00		pH 7.00		377339	pH 7.26
3. pH 4.00		pH 4.00		380327	pH 4.05
4. mV		228.6mV		365451/365421	228.8mV
5. EC		2.78mS		377099	2.78mS
6. D.O		0.00ppm		371864	0.00ppm
7. Temp		21.8°C		MultiTherm	21.3°C

Calibrated by:

Jacqueline Begman

Calibration date:

14/03/2022

Next calibration due:

13/04/2022

Multi Parameter Water Meter

Instrument **YSI Pro DSS**
 Serial No. **21K104038**



Air-Met Scientific Pty Ltd
 1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	x	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.02	NIST	377339	pH 7.15
2. pH 4.00		pH 4.00	NIST	384826	pH 4.08
3. mV		248.6mV	NIST	387761/380834	248.8mV
4. EC		2760uS	NIST	365047	2760uS
6. D.O		0%	NIST	379624	0.002
7. Temp		16.5	NIST		16.6°C
8. Turbidity		100NTU	NIST	387519	100.1NTU

Calibrated by: Gary Needs

Calibration date: **7/06/2022**

Next calibration due: **8/12/2022**

Multi Parameter Water Meter

Instrument YSI Pro DSS
Serial No. 21K104038



Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
	Display	✓	
Grill Filter	Operation (segments)	✓	
	Condition	✓	
PCB	Seal	✓	
	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	x	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00	NIST	381241	pH 7.05
2. pH 4.00		pH 4.00	NIST	389384	pH 3.90
3. mV		242.42mV	NIST	385070/387761	242.9mV
4. EC		2760uS	NIST	385047	2765uS
6. D.O		0%	NIST	379624	-0.2%
7. Temp		18.9	NIST		18.9°C
8. Turbidity		100NTU	NIST	381476	99.03NTU

Calibrated by: _____ Lauren Soutar

Calibration date: 30/06/2022

Next calibration due: 31/12/2022

Multi Parameter Water Meter

Instrument YSI Pro DSS
Serial No. 21K104032



Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad Display	Operation	✓	
	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	x	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00	NIST	381241	pH 6.93
2. pH 4.00		pH 4.00	NIST	389384	pH 3.93
3. mV		241.54mV	NIST	385070/387781	241.5mV
4. EC		2760uS	NIST	385041	2768uS
6. D.O		0%	NIST	371864	- 0.1%
7. Temp		20.4	NIST		19.3°C
8. Turbidity		100NTU	NIST	381476	100.23NTU

Calibrated by: _____ Lauren Soutar

Calibration date: 7/07/2022

Next calibration due: 7/01/2023

Multi Parameter Water Meter

Instrument **YSI Pro DSS**
 Serial No. **15J100067**



Air-Met Scientific Pty Ltd
 1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad Display	Operation	✓	
	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. EC		2.76mS		385041	2.76mS
2. Temp		21.2°C		Testo	20.1°C
3. pH 4		pH 4.00		389384	pH 4.00
4. pH 7		pH 7.00		381241	pH 7.21
5. pH 10		pH 10.00		N/A	N/A
6. DO		0.00ppm		11343	0.00ppm
7. Turbidity		50NTU		38196	80.9NTU
8. mV		240.6mV		365451/370891	239.80mV

Calibrated by: Lebelle Chee

Calibration date: **29/07/2022**

Next calibration due: **28/08/2022**

Multi Parameter Water Meter

Instrument YSi Pro DSS
Serial No. 20F182071



Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Bump Test Certificate

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. COND		2.78mS		385041	2.785mS
2. Temp		17.9°C		MultiTherm	17.8°C
3. pH 4		pH 4.00		389384	pH 4.00
4. pH 7		pH 7.00		381241	pH 6.99
6. ORP mV		244.84mV		385070/387761	244.0mV
7. DO		0.00%		379624	0.0%
8. Turbidity		50NTU		386950	49.49NTU

Calibrated by: Lauren Soutar

Calibration date: 16/08/2022

Next calibration due: 15/09/2022

Multi Parameter Water Meter

Instrument YSI Pro DSS
Serial No. 21K104035



Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. EC		2.76mS		385041	2.76mS
2. Temp		20.5°C		Testo	20.3°C
3. pH 4		pH 4.00		389394	pH 4.09
4. pH 7		pH 7.00		381241	pH 6.94
5. DO		0.0%		11343	-0.2%
6. Turbidity		100NTU		387516	99.69NTU
7. mV		239.9mV		385070/387751	239.7mV

Calibrated by: Yu Jiang

Calibration date: 15/06/2022

Next calibration due: 14/09/2022

DII / Water Interface Meter



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument **Geotech Interface Meter (30M)**
Serial No. **4093**

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity above 7.5v	✓	
Probe	Cleaned/Decon	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: _____ **Lebelle Chee**

Calibration date: **23-Aug-22**

Next calibration due: **19-Feb-23**

Multi Parameter Water Meter

Instrument **YSI Pro DSS**
Serial No. **21K101474**



Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. EC		2.76mS		385041	2.763mS
2. Temp		20.2°C		Testo	19.8°C
3. pH 4		pH 4.00		389384	pH 6.95
4. pH 7		pH 7.00		381241	pH 4.01
5. DO		0.0%		379624	-0.2%
6. Turbidity		50NTU		386950	52.66 NTU
7. mV		239.56mV		390802/387761	239.6mV

Calibrated by: _____ **Lauren Soutar**

Calibration date: **11/10/2022**

Next calibration due: **10/11/2022**

Multi Parameter Water Meter

Instrument **YSI Pro DSS**
Serial No. **21K104037**



Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. EC		2.76mS		365041	2.771mS
2. Temp		22.4°C		Actual temp.	22.6°C
3. pH 4		pH 4.00		394432	pH 4.01
4. pH 7		pH 7.00		386467	pH 6.98
5. DO		0ppm		379624	-0.02 ppm
6. Turbidity		100NTU		395515	100.10 NTU
7. mV		234.72 mV		390802/387761	234.6 mV

Calibrated by: **Yu Jiang**

Calibration date: **31/10/2022**

Next calibration due: **30/11/2022**

Multi Parameter Water Meter

Instrument YSI Pro DSS
Serial No. 21K104033



Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00	pH 7.02		385487	pH 6.99
2. pH 4.00	pH 4.00		384432	pH 3.86
3. mV	236.5mV		380802/387771	236.7mV
4. EC	2.76ms		385788	2.76ms
6. D.O	0%		12110	0.00%
7. Temp	21.8°C		N/A	21.8°C
8. Turbidity	100NTU		N/A	97.5

Calibrated by: Alex Buist

Calibration date: 28/11/2022

Next calibration due: 31/05/2023

Oil / Water Interface Meter



Instrument **Interface Meter (30M)**
Serial No. **348870**

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
	Checked for cuts	✓	
Instrument Test	At surface level	✓	
	I / S		

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: _____ **Dom Ta**

Calibration date: **29/11/2022**

Next calibration due: **28/01/2023**

Multi Parameter Water Meter

Instrument **YSI Pro DSS**
 Serial No. **21K104040**



Air-Met Scientific Pty Ltd
 1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. EC		2.76mS		365789	2.763 mS
2. Temp		21.5°C		Testo	21.6°C
3. pH 4		pH 4.00		389384	pH 3.98
4. pH 7		pH 7.00		385467	pH 6.88
6. DO		0.00%		12110	-0.2%
7. Turbidity		100NTU		395515	100.69NTU
8. mV		236.92mV		393734/393728	236.9 mV

Calibrated by: **Adam Nikolic**

Calibration date: **1/12/2022**

Next calibration due: **31/12/2022**



Appendix H

Photo log

Photograph 1: Basin 1



Photograph 2: Basin 2



Photograph 3: Basin 3



Photograph 1: Basin 1



Photograph 2: Basin 2



Photograph 3: Basin 3



Photograph 1: SW1



Photograph 2: SW2



Photograph 3: SW3



Photograph 4: SW4



Photograph 5: SW4A



Photograph 6: SW5



Photograph 7: SW6



Photograph 8: SW7



Photograph 9: SW8



Photograph 10: SW9



Photograph 11: SW10



Photograph 12: SW11



Photograph 13: Basin 1



Photograph 14: Basin 2



Photograph 15: Basin 3



Photograph 1: SW1



Photograph 2: SW2



Photograph 3: SW3



Photograph 4: SW4



Photograph 5: SW4A



Photograph 6: SW5



Photograph 7: SW6



Photograph 8: SW7



Photograph 9: SW8



Photograph 10: SW9



Photograph 11: SW10



Photograph 12: SW11



Photograph 13: Basin 1



Photograph 14: Basin 2



Photograph 15: Basin 3



Photograph 1: MW01R



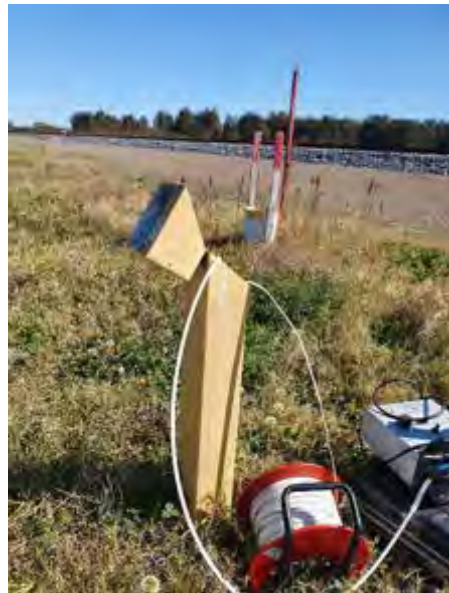
Photograph 2: MW101R



Photograph 3: 101R



Photograph 4: MW02



Photograph 5: MW106R



Photograph 6: MW108R



Photograph 7: MW109



Photograph 8: MW301R



Photograph 9: MW302R



Photograph 10: MW307R



Photograph 11: MW308R



Photograph 1: Basin 1



Photograph 2: Basin 2



Photograph 3: Basin 3



Photograph 1: Basin 1



Photograph 2: Basin 2



Photograph 3: Basin 3



Photograph 1: Basin 1



Photograph 2: Basin 2



Photograph 3: Basin 3



Photograph 1: SW1



Photograph 2: SW2



Photograph 3: SW3



Photograph 4: SW4



Photograph 5: SW4A



Photograph 6: SW5



Photograph 7: SW6



Photograph 8: SW7



Photograph 9: SW8



Photograph 10: SW9



Photograph 11: SW10



Photograph 12: Basin 1



Photograph 13: Basin 2



Photograph 14: Basin 3



Photograph 1: MW01R



Photograph 2: MW101R



Photograph 3: 101R



Photograph 4: MW02



Photograph 5: MW106R



Photograph 6: MW108R



Photograph 7: MW109



Photograph 8: MW301R



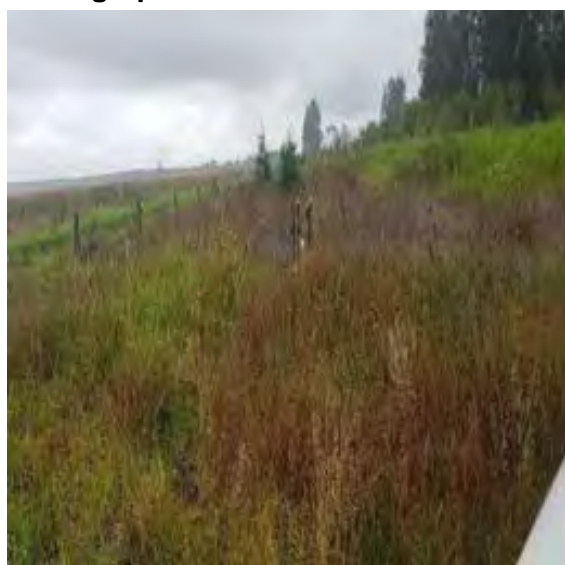
Photograph 9: MW302R



Photograph 10: MW307R



Photograph 11: MW308R



Photograph 12: Basin 1



Photograph 13: Basin 2



Photograph 14: Basin 3



Photograph 1: SW1



Photograph 2: Pipeline Road and farmland flooded – preventing access to SW2, SW3 and SW11



Photograph 3: SW4



Photograph 4: SW4A



Photograph 5: SW5



Photograph 6: SW6



Photograph 7: SW7



Photograph 8: SW8 (pipe flooded by Hunter River)



Photograph 9: SW9 (pipe flooded by Hunter River)



Photograph 10: SW10 (pipe flooded by Hunter River)



Photograph 11: Basin 1



Photograph 12: Basin 2



Photograph 13: Basin 3



Photograph 1: Basin 1



Photograph 2: Basin 2



Photograph 3: Basin 3



Photograph 1: Basin 1



Photograph 2: Basin 2



Photograph 3: Basin 3



Photograph 1: MW01R



Photograph 2: MW101R



Photograph 3: 101R



Photograph 4: MW02



Photograph 5: MW106R



Photograph 6: MW108R



Photograph 7: MW109



Photograph 8: MW301R



Photograph 9: MW302R



Photograph 10: MW307R



Photograph 11: MW308R



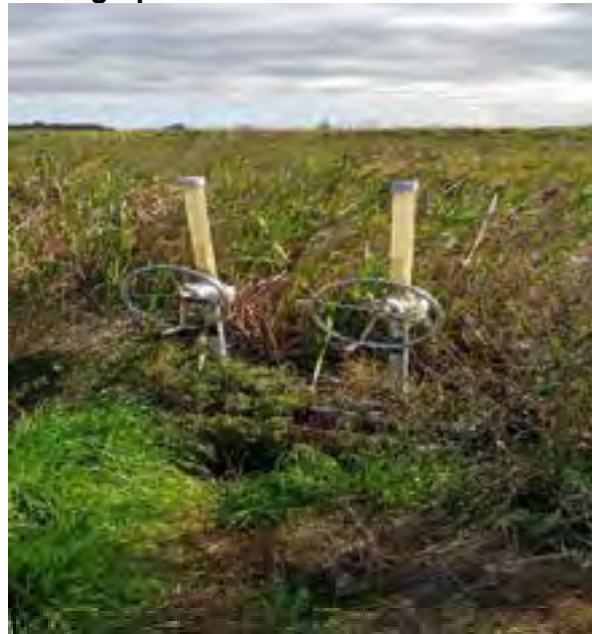
Photograph 12: Basin 1



Photograph 13: Basin 2



Photograph 14: Basin 3



Photograph 1: SW1



Photograph 2: SW2



Photograph 3: SW3



Photograph 4: SW4



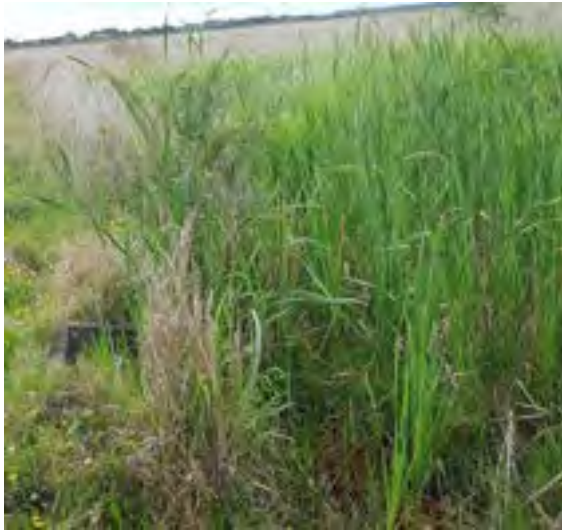
Photograph 5: SW4A



Photograph 6: SW5



Photograph 7: SW6



Photograph 8: SW7



Photograph 9: SW8



Photograph 10: SW9



Photograph 11: SW10



Photograph 12: SW11



Photograph 13: Basin 1



Photograph 14: Basin 2



Photograph 15: Basin 3



Photograph 1: Basin 1



Photograph 2: Basin 2



Photograph 3: Basin 3



Photograph 1: Basin 1



Photograph 2: Basin 2



Photograph 3: Basin 3



Photograph 1: MW01R



Photograph 2: MW101R



Photograph 3: 101R



Photograph 4: MW02



Photograph 5: MW106R



Photograph 6: MW108R



Photograph 7: MW109



Photograph 8: MW301R



Photograph 9: MW302R



Photograph 10: MW307R



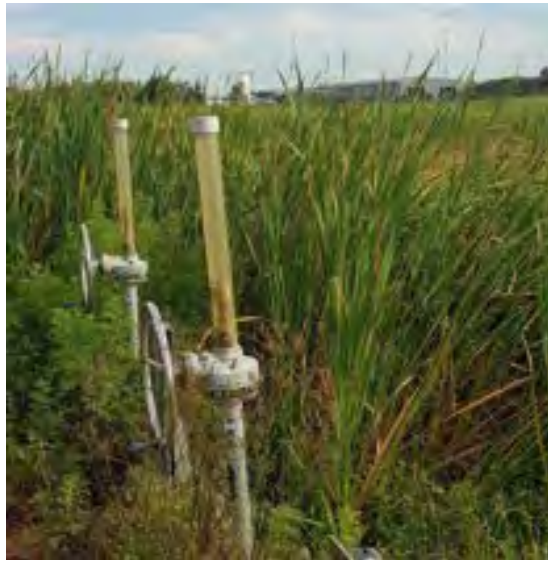
Photograph 11: MW308R



Photograph 12: Basin 1



Photograph 13: Basin 2



Photograph 14: Basin 3





ghd.com

→ **The Power of Commitment**

APPENDIX D – Compliance Report Declaration Form

Project Information

Project Name:	Hexham Train Support Facility
Project Application Number:	State Significant Infrastructure MP07_0171 (SSI 6090) MOD 2
Description of Project:	Operational Train Support Facility
Project Address:	Off Anderson Drive, Hexham, NSW, 2322
Proponent:	Aurizon Holdings Ltd.
Title of Compliance Report:	Hexham Train Support Facility: Operational Compliance Report (2022)
Date:	24/04/2023

I declare that I have reviewed relevant evidence and prepared the contents of the attached Compliance Report and to the best of my knowledge:

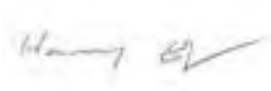
- the Compliance Report has been prepared in accordance with all relevant conditions of consent;
- the Compliance Report has been prepared in accordance with the Compliance Reporting Post Approval Requirements;
- the findings of the Compliance Report are reported truthfully, accurately and completely;
- due diligence and professional judgement have been exercised in preparing the Compliance Report; and
- the Compliance Report is an accurate summary of the compliance status of the development.

Notes:

- Under section 10.6 of the Environmental Planning and Assessment Act 1979 a person must not include false or misleading information (or provide information for inclusion in) a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is false or misleading in a material respect. The proponent of an approved project must not fail to include information in (or provide information for inclusion in) a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is materially relevant to the monitoring or audit. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000; and

The Crimes Act 1900 contains other offences relating to false and misleading information: section 307B (giving false or misleading information – maximum penalty 2 years' imprisonment or 200 penalty units, or both).

Deceleration

Name of Authorized Reporting Officer:	Harry Egan
Title:	Senior Adviser Environment
Signature:	
Qualification:	Bachelor of Environmental Science and Management
Company:	Aurizon Holdings Limited
Company Address:	900 Ann Street, Fortitude Valley QLD, Australia 4006