

2024 Compliance Report

Northeast Business Park Project, Queensland
EPBC Approval No. 2006/2912



North Harbour

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Document Version Control

VERSION	PREPARED BY	REVIEWED BY	DATE
1.0	M. McErlean	B. Finney M. Hall-Brown	03/08/24

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Introduction

North Harbour Holdings Pty Ltd is currently developing a master planned community, known as "North Harbour". On 12 July 2006, the project was determined to be a controlled action pursuant to s.75 of the *Environmental Protection and Biodiversity Conservation Act 1999* under the controlling provisions of;

- Sections 16 and 17B (Wetlands of international importance)
- Sections 18 and 18A (Listed threatened species and communities)
- Sections 20 and 20A (Listed migratory species)

Following a detailed environmental impact investigation and assessment process, the project was granted approval with conditions on 18 December 2012. Commencement of the action (as defined within the approval) was triggered 12 May 2014. Condition 3 of the approval requires the publication of an annual report, addressing compliance with each of the conditions of approval.

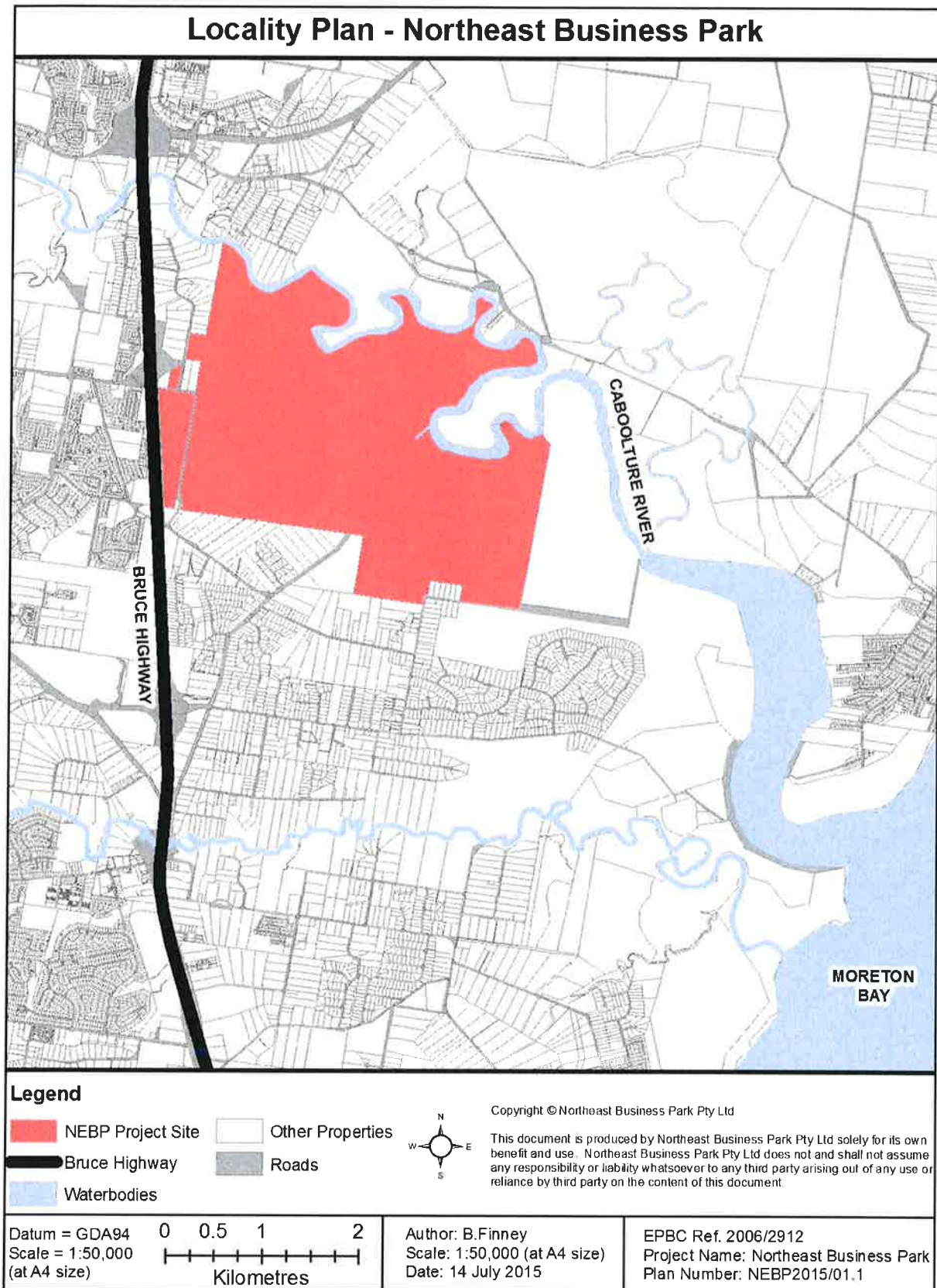
This document is the tenth compliance report, relating to activities undertaken from 13 May 2022 to 12 May 2024. Please note that during the preparation period of this report, subsequent approvals have been acquired. Reporting associated with these approvals and works undertaken after 12 May 2024 will be provided in the 2025 report.

Project Description

EPBC Number:	2006/2912
Project Name:	Northeast Business Park
Approval Holder:	North Harbour Holdings Pty Ltd (ACN: 101 569 457)*
Approved Action:	To develop an approximately 762 hectare site, for an integrated business park, including residential and marina precincts, located to the east of the Bruce Highway, and bounded to the north by the Caboolture River, Caboolture Shire, Queensland.
Project Location:	The project is located in the Moreton Bay region, Queensland. The property address is 34 Nolan Drive, Morayfield. The site is bounded to the west by the Bruce Highway and to the north by the Caboolture River, as shown on the locality plan at figure 1.
Responsible Person:	Malcolm Hall-Brown (Chairman)
Reporting Period:	13 May 2023 – 12 May 2024
Report Preparation:	June to August 2024

* Approval holder previously known as Northeast Business Park Pty Ltd. The ABN / ACN and other business details remain the same.

Figure 1



Description of Activities

During the period relevant to this report, the following activities have been undertaken for the project;

Activities undertaken under the LBEMP & sub-plan 1

All activities undertaken under sub-plan 1 were completed in a previous reporting period (2014 – 2015). Please refer to the 2015 compliance report in relation to these actions.

Activities undertaken under the LBEMP & sub-plan 2

All activities undertaken under sub-plan 2 were completed in previous reporting periods (2014 – 2015 and 2015 - 2016). Please refer to the previous compliance reports in relation to these actions.

Activities undertaken under the LBEMP & sub-plan 3

All activities undertaken under sub-plan 3 were completed in previous reporting periods (2015 – 2016 and 2016 - 2017). Please refer to the previous compliance reports in relation to these actions.

Activities undertaken under the LBEMP & sub-plan 4

Sub-plan 4 (approved 17 June 2016) defined the approved works program for;

- Vegetation clearing, bulk earthworks and civil construction of phases 3 - 7 (stages 14 to 45) of the residential development. These works were commenced in the 2017 reporting period and were completed prior to 12 May 2024 (closing date for the 2024 compliance reporting period)

Activities undertaken under the LBEMP & sub-plan 5

All activities undertaken under Sub-plan 5 (approved 3 April 2018) were completed in previous reporting period (2018 - 2019). Please refer to the previous compliance report in relation to these actions.

Activities undertaken under the LBEMP & sub-plan 6

Sub-plan 6 (approved 4 January 2021) defined the approved works program for;

- Vegetation clearing, bulk earthworks and civil construction of the Mixed Industry and Business development. These works were commenced in April 2021 and were ongoing at 12 May 2024 (closing date for the 2024 compliance reporting period). These works are expected to be undertaken progressively over the coming years.
- An updated Sub-plan 6 has been submitted and an approval is expected in September 2024. The changes to the Sub-plan will reduce the extent of earthworks to be undertaken in the north portion of the development.

Activities undertaken under the LBEMP & sub-plan 7

Sub-plan 7 (approved 23 August 2021) defined the approved works program for;

- Vegetation clearing, bulk earthworks and civil construction of the drainage improvement works east of stages 44-45. These works were commenced in August 2022 and were completed prior to 12 May 2024 (closing date for the 2024 compliance reporting period).

Activities undertaken under the LBEMP

An updated LBEMP was approved 21 December 2021. The changes to the LBEMP do not impact the approved Sub-plans.

Other project related activities

Vegetation rehabilitation of a riparian corridor alongside the Caboolture River (100m wide behind the top of the southern riverbank) has been underway for some time, with various planting and management methodologies being trialled since 2012. Rehabilitation actions in the current reporting period focused on control of weed species and maintenance within existing replanted areas. Assessment of rehabilitation progress within the riparian corridor has been undertaken as part of the current report (see appendix C).

Instances of Non-Compliance

No instances of non-compliance with the conditions of approval 2001/2912 were identified during the reporting period.

The project site was inspected by officers of the Department of Environment and Energy on 25 September 2018. The inspection was for the purpose of monitoring compliance with the EPBC

approval. No instances of non-compliance were identified during the site visit, as confirmed by the follow up letter sent 7 November 2018.

Summary

The long-term development of the project has continued in the 2023 - 2024 reporting period, with this report providing information on operations conducted during the tenth 12 month reporting period following commencement of the action.

No compliance issues have been identified during the reporting period.

Declaration of accuracy

In making this declaration, I am aware that sections 490 and 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) make it an offence in certain circumstances to knowingly provide false or misleading information or documents. The offence is punishable on conviction by imprisonment or a fine, or both. I declare that all the information and documentation supporting this compliance report is true and correct in every particular. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed

Full name (please print)

Malcolm Hall-Brown

Position (please print)

Chairperson

Organisation (please print including ABN/ACN if applicable)

North Harbour Holdings Pty Ltd
ACN 101 569 457

Date

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APPENDICES

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APPENDIX A: COMPLIANCE ASSESSMENT REPORTING TABLE

EPBC APPROVAL 2006/2912 - COMPLIANCE ASSESSMENT REPORTING TABLE

Condition Number / Reference	Condition	Project Compliance	Evidence / Comments
1	Within 20 days after the commencement of the action, the person taking the action must advise the Department in writing of the actual date of commencement of the action.	Not Applicable	Addressed in the 2015 report.
2	The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plans required by this approval, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.	Compliant	Accurate records maintained by the proponent and contractors, as demonstrated by the information below and associated documentation attached. This includes the testing summaries for surface water quality monitoring, groundwater quality monitoring and acid sulphate soils at appendix C. Records available for audit by the Department or independent auditor upon request.
3	Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published.	Compliant	The 2023 compliance report was uploaded to the NEBP website 14 August 2023, within 3 months of the commencement date anniversary (12 May 2014). This was confirmed via email to the Department as evidenced at appendix C.
4	Upon the direction of the Minister, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit	Not Applicable	No direction for an independent audit issued by the Minister in the 12 month period applicable to this report.

	criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.		
5	If the person taking the action wishes to carry out any activity otherwise than in accordance with the management plan/s as specified in the conditions, the person taking the action must submit to the Department for the Minister's written approval a revised version of that management plan/s. The varied activity shall not commence until the Minister has approved the varied management plan/s in writing. The Minister will not approve a varied management plan/s unless the revised management plan/s would result in an equivalent or improved environmental outcome over time. If the Minister approves the revised management plan/s, that management plan/s must be implemented in place of the management plan's originally approved.	Not Applicable	No activities undertaken otherwise than in accordance with the management plans (approved LBEMP, sub-plan 4 and sub-plan 6 and sub-plan 7) during the 12 month period applicable to this report. Please note activities undertaken under sub-plans 1, 2, 3 and 5 were completed prior to this reporting period. For further detail please refer to the 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022 and 2023 compliance reports.
6	If the Minister believes that it is necessary or convenient for the better protection of the Moreton Bay Ramsar site (sections 16 and 17B of the EPBC Act), listed threatened species (sections 18 and 18A of the EPBC Act) or migratory shorebirds (sections 20 and 20A of the EPBC Act) to do so, the Minister may request that the person taking the action make specified revisions to the management plan/s specified in the conditions and submit the revised management plan/s for the Minister's written approval. The person taking the action must comply with any such request. The revised approved management plan/s must be implemented. Unless the Minister has approved the revised management plan/s then the person taking the action must continue to implement the management plan/s originally approved, as specified in the conditions.	Not Applicable	No request from the Minister to revise the management plans received in the 12 month period applicable to this report.
7	If, at any time after five years from the date of this approval, the person taking the action has not substantially commenced	Not Applicable	Addressed in the 2015 report.

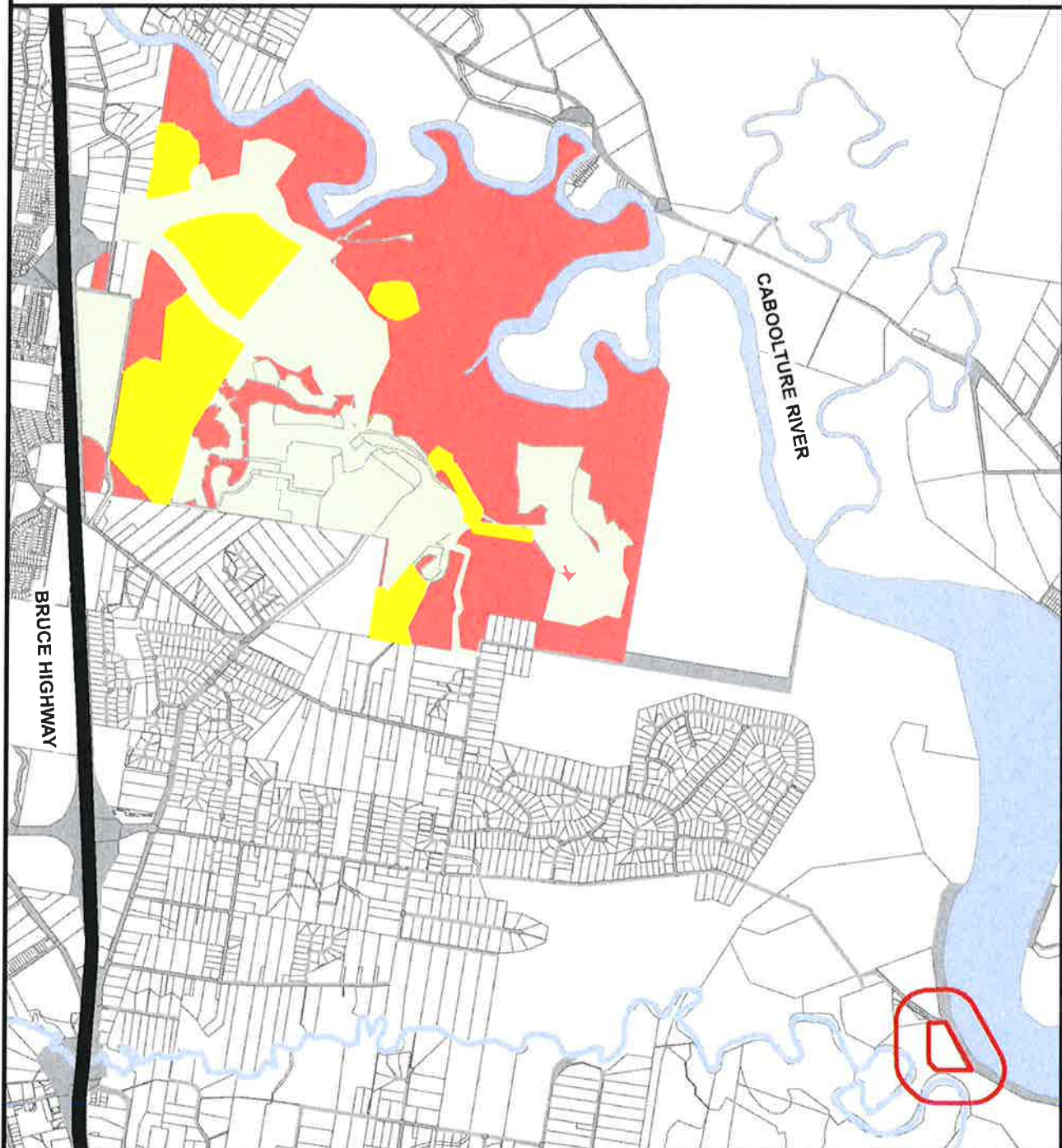
	the action, then the person taking the action must not substantially commence the action without the written agreement of the Minister.		
8	Unless otherwise agreed to in writing by the Minister, the person taking the action must publish all management plans referred to in these conditions of approval on their website. Each management plan must be published on the website within one month of being approved.	Compliant	Works during the period relate to the LBEMP, sub plan 4, sub-plan 6 and sub-plan 7, which were all approved in prior reporting periods and addressed in previous compliance reports.
9	The person taking the action must prepare and submit a Land-Based Environmental Management Plan (LBEMP) for the Minister's approval. The LBEMP must include, but not be limited to, the following: a. Measures to minimise impacts on EPBC Act listed threatened species, including measure to care for injured fauna and a vegetation clearing strategy; b. Measures to limit the spread of pests and invasive species; c. Sediment and erosion controls; and d. Measures to implement, monitor, or improve (should deficiencies be identified) the LBEMP The person taking the action must not conduct clearance of native vegetation unless the Minister has approved the LBEMP. The approved LBEMP must be implemented.	Compliant	Works undertaken in this reporting period in the areas addressed by the LBEMP, sub-plan 4, sub-plan 6 and sub-plan 7. Land Based Environmental Management Plan, sub-plan 4, sub-plan 6 and sub-plan 7 were prepared and approved prior to commencement of relevant works, including provisions for points a. - d. in condition 9. LBEMP approved 21/12/2021 LBEMP sub-plan 4 approved 17/06/2016 LBEMP sub-plan 6 approved 4/1/2021 LBEMP sub-plan 7 approved 23/8/2021 Clearance of native vegetation undertaken in accordance with management plans as outlined in the LBEMP recordkeeping tables at appendix B. Post clearance fauna reports attached at appendix D.
10	The person taking the action must not destroy by clearing or any other activity, more than 25 ha of native vegetation on the subject site.	Compliant	Clearance of native vegetation undertaken in accordance with management plans as outlined in the LBEMP recordkeeping tables at appendix B. Post

	a. If clearing more than 25 ha of native vegetation is necessary, the person taking the action must: i. Undertake a pre-clearance survey of additional areas to be cleared; and ii. Submit the pre-clearance survey to the Minister for approval, prior to clearing. The person taking the action must not clear more than 25 ha of native vegetation unless then Minister has provided approval in writing to do so.		clearance fauna reports attached at appendix D.
11	No construction activities may occur within 200 m of the critical high tide shorebird roost area at the mouth of the Caboolture River, during the months of September to April (inclusive) of any given year.	Compliant	The shorebird roost area is well removed from the project site owned by North Harbour Holdings Pty Ltd. Only works associated with dredging of the navigation channel in the Caboolture River will occur in the vicinity of the roost area. No dredging or associated works have been undertaken in the reporting period. All construction activities undertaken in the reporting period have been outside the 200m buffer to the critical high tide shorebird roost area, as shown by plan number NEBP2019/02.1 (below).
12	The person taking the action must undertake, maintain and monitor all bank rehabilitation and restoration works detailed in Appendix J of the EIS – Riverbank Erosion Assessment, to prevent unacceptable impacts to wetlands of international importance (section 16 and 17B of the EPBC Act). This must include, but not be limited to: a. Undertaking, maintaining and monitoring the revegetation of riparian area on the referred subject site; and b. Undertaking, maintaining and monitoring the restoration of wetland area on the referred subject site.	Compliant	The existing rehabilitation works in riparian areas alongside the Caboolture River have continued to be maintained.

13	The person taking the action must prepare and submit a Caboolture River Estuary Management Plan (CREMP) for the Minister's approval. a. The CREMP must include, but not be limited to the following: i. Detail all restoration and rehabilitation works that will be undertaken to mitigate impacts on the river bed and banks, including a description of priority works and agreed performance criteria. The strategy must avoid the use of artificial bank protection structures; ii. Identify corrective actions or alternative options that will be implemented if unexpected adverse impacts on marine and shorebird species are detected and are attributed to the construction and operation of the action; iii. Specify a schedule of works and/or compensatory actions required to address all potential development related impacts, and measures to implement them; iv. Specify a monitoring program, including requirements for further baseline data that must be collected prior to capital dredging works. Monitoring must include, but not be limited to: 1. Wave energy recorded at the river bank at a minimum of three key locations. Monitoring must also include concurrent measurements of boat traffic and wind velocity. This must be conducted at least once every three months; 2. Water level recording in the mid estuary to determine any changes to the hydrodynamics that may be attributable to dredging. This must be conducted at least once every three months; 3. Annual bank erosion monitoring at fixed locations, including but not limited to, at least four monitoring points on the northern bank of the Caboolture River, evenly spaced within one kilometre downstream of the marina entrance; 4. Hydrographical surveys of the river bed and	Not Applicable	No works impacting on the Caboolture River were undertaken in the 12 month period applicable to this report. Preparation and Minister's approval of the CREMP to be undertaken at a future date, prior to works impacting the Caboolture River.
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	banks in the vicinity of the upper one-third of the dredged channel, between three and six months from completion of dredging works. Survey must be undertaken by a qualified hydrographical surveyor and consist of soundings no more than 10 metres apart and within a vertical accuracy of 0.1 metre or better; 5. Shorebird monitoring at a minimum of ten key locations in the lower estuary of the Caboolture River, including the critical high tide shorebird roost area at the mouth of the Caboolture River; and 6. Sampling of benthic invertebrates on shallow banks adjacent to the dredged channel at a minimum of three locations. b. The CREMP must be reviewed annually (within three months of every 12 months anniversary of the commencement of works impacting on the Caboolture River) by the person taking the action, with any revision to be approved by the Minister before implementation of changes. The person taking the action must not commence works impacting on the Caboolture River unless the Minister has approved the CREMP. The approved CREMP must be implemented.		
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Northeast Business Park - Proximity of Works to Shorebird Roost



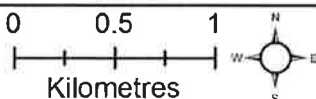
Legend

- | | |
|---|---|
| NEBP Project Site | Shorebird Roost & Buffer |
| Roads | Other Properties |
| Waterbodies | 2023-2024 Works |
| | Works in prev. reporting |

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Author: M. McErlan
Date: 4 August 2024

EPBC Ref. 2006/2912
Project Name: Northeast Business Park
Plan Number: NEBP2019/02.1

APPENDIX B: LBEMP RECORDKEEPING SUMMARY TABLES

LBEMP RECORD KEEPING

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
LBEMP section 8 point 1	Retain appropriate records concerning the preparation and implementation of LBEMP Sub Plans, including; - A register of all LBEMPs including all Sub-Plans, along with hard copies of each LBEMP; and - All records that are required by each element of an implemented LBEMP Sub-Plan, including copies of all issue specific management plans each LBEMP Sub-Plan draws from.	Compliant	Register of all LBEMPs in place. As at 12 May 2024, register includes; LBEMP v3 (21 Dec 2021) Sub-Plan 01 v2 (31 Jan 2014) Sub-Plan 02 v1.2 (22 Aug 2014) Sub-Plan 03 (RW6) (28 July 2015) Sub-Plan 04 (RW5) (15 Sept 2017) Sub-Plan 05 (RW1) (28 Mar 2018) Sub-Plan 06 (MIBA) (4 Jan 2021) Sub-Plan 07 (Flood) (23 Aug 2021) Record Keeping required by sub-plans in place. Refer to sub-plan record keeping tables below for further information.
LBEMP section 8 point 2	Review this LBEMP: - As part of the preparation of each LBEMP Sub-Plan; - Following significant environmental incidents involving a MNES; - At the completion of any environmental audit carried out by the DCCEEW; and - In the instance where the objectives of any element of this LBEMP are not being met.	Compliant	LBEMP reviewed as part of the preparation of sub-plans 1 to 7. No significant environmental incidents involving a MNES have occurred. DCCEEW (formerly DotE) inspection of the works identified no issues requiring change to existing procedures. Objectives for all LBEMP elements are considered to be achieved for works in the reporting period.

LBEMP SUB-PLAN 1 RECORD KEEPING

Not applicable to this reporting period – refer 2014-2015 Compliance Report

LBEMP SUB-PLAN 2 RECORD KEEPING

Not applicable to this reporting period – refer 2014-2015 and 2015-2016 Compliance Reports

LBEMP SUB-PLAN 3 RECORD KEEPING

Not applicable to this reporting period – refer 2015-2016 and 2016-2017 Compliance Reports

LBEMP SUB-PLAN 4 RECORD KEEPING

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
Subplan 4 Section 6 Point 1	Copies of all relevant permits or approvals relevant to the works the subject of this LBEMP Sub-Plan 04	Compliant	All relevant permits and approvals obtained for subplan 4 works undertaken in the reporting period, as set out in the schedule below. Copies can be provided upon request by DCCEEW.
Subplan 4 Section 6 Point 2	The name, qualifications and contact details of the suitably qualified ecologist engaged to assist in the preparation of this LBEMP Sub-Plan 04	Compliant	Sub-Plan 4 prepared by James Warren and Associates (JWA) (Adam McArthur). Qualification and contact details can be provided upon request by DCCEEW .
Subplan 4 Section 6 Point 3	The dates and findings of the preclearance flora and fauna surveys and the name, qualifications and contact details of the ecologist who completed the surveys	Compliant	Ecological Assessment Report completed 3 November 2015 by JWA (Adam McArthur). The previous Ecological Assessment Report completed 4 June 2014 by Cardno (QLD) (John Delaney) is also relevant for some areas of Subplan 4 works. Prior to works commencing, a pre-clearing report was completed by Australia Wide Environmental Consultants. Copy of reports and associated information can be provided upon request by DCCEEW .
Subplan 4 Section 6 Point 4	The name, qualifications and contact details of the licensed fauna spotter catcher engaged to supervise vegetation clearance works	Compliant	No vegetation clearance works were undertaken during the reporting period.
Subplan 4 Section 6 Point 5	The dates and locations of all vegetation clearance works	Compliant	No vegetation clearance works were undertaken during the reporting period.

Subplan 4 Section 6 Point 6	The post clearance Fauna Management Report as required by section 4.2 of the LBEMP Sub-Plan 04	Compliant	No vegetation clearance works were undertaken during the reporting period.
Subplan 4 Section 6 Point 7	Any records required to be kept in for specific environmental management elements as identified in Section 4 of this LBEMP sub plan 04	Compliant	Records relating to compliance with environmental management elements have been maintained, including under associated approved management plans for; - Acid Sulphate Soils MP - Water Quality MP - Stormwater Quality and Site Based Mgt. - Construction Environment MP Records include (but not limited to); - Testing and validation for ASS - Monitoring of ground water and surface water quality - Sediment basin discharge authorisations - Pest hygiene declarations Copies of records can be provided upon request by DCCEEW.
Subplan 4 Section 6 Point 8	All incident reports and corrective action requests generated during the works program	Not Applicable	No incident reports or corrective action requests generated during the reporting period.

LBEMP SUB-PLAN 5 RECORD KEEPING

Not applicable to this reporting period – refer 2018-2019 Compliance Reports

LBEMP SUB-PLAN 6 RECORD KEEPING

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
Subplan 6 Section 6 Point 1	Copies of all relevant permits or approvals relevant to the works the subject of this LBEMP Sub-Plan 06.	Compliant	All relevant permits and approvals obtained for subplan 6 works undertaken in the reporting period, as set out in the schedule below. Copies can be provided upon request by DCCEEW.
Subplan 6 Section 6 Point 2	The name, qualifications and contact details of the suitably qualified ecologist engaged to assist in the preparation of this LBEMP Sub-Plan 06.	Compliant	Sub-Plan 6 prepared by James Warren and Associates (JWA) (Adam McArthur). Qualification and contact details can be provided upon request by DCCEEW.
Subplan 6 Section 6 Point 3	The dates and findings of the preclearance flora and fauna surveys and the name, qualifications and contact details of the ecologist who completed the surveys.	Compliant	A number of Ecological Assessment Reports have been prepared over sub-plan 6 including: • Terrestrial Ecology Assessment Report – Northeast Business Park (Cardno 2007 - John Delaney); • Ecological Assessment Report: NEBP – Residential West RoL (Cardno 2014 - John Delaney); • Wetland Mapping Report: North East Business Park Residential West Area (JWA 2015 - Adam McArthur); • Significant Residual Impact Assessment – Marine Plants, North East Business Park Raff Creek Crossing (JWA 2019a -- Adam McArthur); and • Significant Residual Impact Assessment – Marine Plants, North East Business Park MIBA Bulk Earthworks (JWA 2019b -- Adam McArthur).

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
			Copy of reports and associated information can be provided upon request by DCCEEW.
Subplan 6 Section 6 Point 4	The name, qualifications and contact details of the licensed Fauna Spotter / Catcher engaged to supervise vegetation clearance works.	Not Applicable	During the reporting period, vegetation clearance works were undertaken as per the pre and post-disturbance fauna report and attached at appendix D.
Subplan 6 Section 6 Point 5	The dates and locations of all vegetation clearance works.	Not Applicable	During the reporting period, vegetation clearance works were undertaken as per the pre and post-disturbance fauna report and attached at appendix D.
Subplan 6 Section 6 Point 6	The post-clearance Fauna Management Report as required by SECTIONS 4.2 and 4.3 of this LBEMP Sub-Plan 06.	Not Applicable	Copy of reports by Australia Wide Environmental Consultants provided following clearing and attached at appendix D.
Subplan 6 Section 6 Point 7	Any records required to be kept in for specific environmental management elements as identified in SECTION 4 of this LBEMP Sub-Plan 06.	Compliant	Records relating to compliance with environmental management elements have been maintained, including under associated approved management plans for; - MIBA Bulk Earthworks – Site Stabilisation / Ecological Restoration Plan (Place Design Group 2020) - Pest and Invasive Species Plan (JWA 2020a) - Erosion and Sediment Control Strategy (Design Flow 2019) - Acid Sulphate Soil Investigation and Management Plan (Tectonic Geotechnical 2019) - Fauna Management Plan - Vegetation Management Plan

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
			Records include (but not limited to); - Testing and validation for ASS - Pre- construction Groundwater Monitoring - Monitoring of ground water and surface water quality - Sediment basin discharge authorisations - Baseline Vegetation and Weed Monitoring - Pest hygiene declarations Copies of records can be provided upon request by DCCEEW.
Subplan 6 Section 6 Point 8	All incident reports and corrective action requests generated during the works program.	Not Applicable	No incident reports or corrective action requests generated during the reporting period.

LBEMP SUB-PLAN 7 RECORD KEEPING

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
Subplan 7 Section 6 Point 1	Copies of all relevant permits or approvals relevant to the works the subject of this LBEMP Sub-Plan 07.	Compliant	All relevant permits and approvals obtained for subplan 7 works undertaken in the reporting period, as set out in the schedule below. Copies can be provided upon request by DCCEEW.
Subplan 7 Section 6 Point 2	The name, qualifications and contact details of the suitably qualified ecologist engaged to assist in the preparation of this LBEMP Sub-Plan 07.	Compliant	Sub-Plan 7 prepared by James Warren and Associates (JWA) (Adam McArthur). Qualification and contact details can be provided upon request by DCCEEW.
Subplan 7 Section 6 Point 3	The dates and findings of the preclearance flora and fauna surveys and the name, qualifications and contact details of the ecologist who completed the surveys.	Compliant	A number of Ecological Assessment Reports have been prepared over sub-plan 7 including: • Ecological Assessment Report: – Flood Mitigation Works (JWA 2021 – Adam McArthur); • Assessment of Impact on fish, fish passage and fisheries habitat (FRC 2021 – Dr. Andrew Bentley); • Vegetation and Fauna Management Plan (JWA 2021 – Adam McArthur) In addition to the above reports, Baseline Vegetation and Weed Monitoring was undertaken in September 2021. Prior to works commencing, a pre-clearing report was completed by Australia Wide Environmental Consultants. Copy of reports and associated information can be provided upon request by DCCEEW.

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
Subplan 7 Section 6 Point 4	The name, qualifications and contact details of the licensed Fauna Spotter / Catcher engaged to supervise vegetation clearance works.	Compliant	No vegetation clearance works were undertaken during the reporting period.
Subplan 7 Section 6 Point 5	The dates and locations of all vegetation clearance works.	Compliant	No vegetation clearance works were undertaken during the reporting period.
Subplan 7 Section 6 Point 6	The post-clearance Fauna Management Report as required by SECTIONS 4.2 and 4.3 of this LBEMP Sub-Plan 07.	Compliant	No vegetation clearance works were undertaken during the reporting period.

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
Subplan 7 Section 6 Point 7	Any records required to be kept in for specific environmental management elements as identified in SECTION 4 of this LBEMP Sub-Plan 07.	Compliant	Records relating to compliance with environmental management elements have been maintained, including under associated approved management plans for; - Unnamed Creek Bulk Earthworks – Site Stabilisation / Ecological Restoration Plan (Place Design Group 2020) - Pest and Invasive Species Plan (JWA 2020a) - Erosion and Sediment Control Strategy (Design Flow 2019) - Acid Sulphate Soil Investigation and Management Plan (Tectonic Geotechnical 2019) - Fauna Management Plan - Vegetation Management Plan Records include (but not limited to); - Testing and validation for ASS - Pre- construction Groundwater Monitoring - Monitoring of ground water and surface water quality - Sediment basin discharge authorisations - Baseline Vegetation and Weed Monitoring - Pest hygiene declarations Copies of records can be provided upon request by DCCEEW.

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
Subplan 7 Section 6 Point 8	All incident reports and corrective action requests generated during the works program.	Not Applicable	No incident reports or corrective action requests generated during the reporting period.

Northeast Business Park - Register of Permits or Approvals relevant to Land Based Environmental Management Plans

LBEMP Sub-Plan 1

Not applicable for 2023-2024 reporting period (All works previously completed). Refer 2014 – 2015 Compliance Report.

LBEMP Sub-Plan 2

Not applicable for 2023-2024 reporting period (All works previously completed). Refer 2014 – 2015 and 2015 – 2016 Compliance Reports.

LBEMP Sub-Plan 3

Not applicable for 2023-2024 reporting period (All works previously completed). Refer 2015 – 2016 and 2016 – 2017 Compliance Reports.

LBEMP Sub-Plan 4

Reference	Approval Date	Description
MCU-2004-1420	28 June 2013	Preliminary approval for the Residential West precinct. Includes State and Local Government conditions and the Residential West Area Plan.
DA/31654/2016/V4E/1	17 November 2016	Operational Works for North Harbour, Phases 3 to 7 & Palm Farm, Earthworks & Prescribed Tidal Work
DA/31654/2016/V3RL	21 December 2016	Reconfiguring a Lot - Development Permit for Subdivision (4 into 1,095 Lots and Balance Lot)
DA/31654/2016/V4LE/2	20 March 2017	Operational Works for Landscaping and Stormwater Management: Wetland D
DA/31654/2016/V4D/4	6 April 2017	Operational Works for North Harbour, Wetland E, Stormwater, Earthworks & Landscaping
DA/31654/2016/V4D/1	6 April 2017	Operational Works for North Harbour, Stage 16, Roads Stormwater Earthworks, Water and Sewerage
DA/31654/2016/V4D/2	11 April 2017	Operational Works for North Harbour, Stage 15, Roads Stormwater Earthworks, Water and Sewerage
DA/31654/2016/V4D/3	11 April 2017	Operational Works for North Harbour, Stage 14, Roads Stormwater Earthworks, Water and Sewerage
DA/31654/2016/V4D/5	25 May 2017	Operational Works for North Harbour Wetland C, Stormwater, Earthworks & Landscaping
DA/31654/2016/V4D/7	8 June 2017	Operational Works for North Harbour, Stage 20, Roadworks Stormwater and Earthworks
DA/31654/2016/V4D/6	2 June 2017	Operational Works for North Harbour, Stage 24, Roadworks and Stormwater Drainage
DA/31654/2016/V4D/8	27 July 2017	Operational Works for North Harbour, Stage 23, Roadworks and Stormwater Drainage
DA/31654/2016/V4D/10	11 August 2017	Operational Works for Roadworks and Drainage
DA/31654/2016/V4D/11	27 September 2017	Operational Works for North Harbour, Stage 17, Roads Stormwater Earthworks, Water and Sewerage
DA/31654/2016/V4D/13	17 November 2017	Operational Works for North Harbour, Stage 18, Roadworks, Drainage and Stormwater
DA/31654/2016/V4D/9	20 November 2017	Operational Works for North Harbour, Stage 21, Roadworks, Drainage and Stormwater
DA/31654/2016/V4D/14	20 November 2017	Operational Works for North Harbour, Stage 19, Roadworks, Drainage and Stormwater
DA/31654/2016/V4E/2	4 January 2018	Operational Works for Earthworks
DA/31654/2016/V4D/18	21 February 2018	Operational Works for North Harbour, Stage 37, Roads Stormwater Earthworks, Water and Sewerage
DA/31654/2016/V4D/15	12 March 2018	Operational Works for North Harbour, Stage 34, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/16	12 March 2018	Operational Works for North Harbour, Stage 35, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/17	12 March 2018	Operational Works for North Harbour, Stage 36, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/19	24 April 2018	Operational Works for Wetland B – Stormwater and Landscaping
DA/31654/2016/V4D/12	23 July 2018	Operational Works for North Harbour, Stage 22, Roadworks and Stormwater
DA/31654/2016/V4D/24	2 July 2020	Operational Works for North Harbour, Stage 42B, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/20	22 June 2020	Operational Works for North Harbour, Stage 43, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/22	23 June 2020	Operational Works for North Harbour, Stage 44, Roadworks, Stormwater and Earthworks

DA/31654/2016/V4D/23	2 July 2020	Operational Works for North Harbour, Stage 45, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/25	14 July 2020	Operational Works for North Harbour, Stage 27, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/27	13 August 2020	Operational Works for North Harbour, Stage 26, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/28	13 August 2020	Operational Works for North Harbour, Stage 25, Roadworks, Stormwater and Earthworks
DA/2021/3387	9 September 2021	Operational Works for North Harbour, Stage 28, Roadworks, Stormwater and Earthworks
DA/2021/3388	13 September 2021	Operational Works for North Harbour, Stage 29, Roadworks, Stormwater and Earthworks
DA/2021/5246	3 February 2022	Operational Works for North Harbour, Stage 30, Roadworks, Stormwater and Earthworks
DA/2021/5247	15 February 2022	Operational Works for North Harbour, Stage 31, Roadworks, Stormwater and Earthworks
DA/2021/5248	3 February 2022	Operational Works for North Harbour, Stage 32, Roadworks, Stormwater and Earthworks
DA/2021/3386	9 September 2021	Operational Works for North Harbour, Stage 38, Roadworks, Stormwater and Earthworks
DA/2022/0895	18 July 2022	Operational Works - Development Permit for Landscaping (North Harbour, Stage 31)
DA/2022/0893	12 April 2022	Operational Works - Development Permit for Landscaping (North Harbour, Stage 30)
DA/2022/5211	24 January 2023	Operational Works for North Harbour, Stage 39, Roadworks, Stormwater and Earthworks
DA/2023/1853	1 June 2023	Operational Works for North Harbour, Stage 40, Roadworks, Stormwater and Earthworks
DA/2023/1874	30 May 2023	Operational Works for North Harbour, Stage 41, Roadworks, Stormwater and Earthworks
DA/2023/2010	15 June 2023	Operational Works for North Harbour, Stage 33, Roadworks, Stormwater and Earthworks

- Note: Register Current as at 12 May 2024
- Other approvals including operational works for future stages may have been recently approved but are not relevant to the reporting period.

LBEMP Sub-Plan 5

Not applicable for 2023-2024 reporting period (All works previously completed). Refer 2018-2019 Compliance Reports.

LBEMP Sub-Plan 6

Reference	Approval Date	Description
DA/7352/2002/VCHG/3	22 January 2020	Request to Change (Other) for a Material Change of Use, and for variations to the applicable Planning Scheme under s.3.1.6 of the Integrated Planning Act 1997 (QLD) in relation to development for Mixed Industry, Business Area Precincts, Open Space and Related Purposes. (Original approval dated 28 June 2012).
DA/39447/2019/V4D	27 February 2020	Operational Works for MIBA Bulk Earthworks
DA/31654/2016/V4D/29	11 December 2020	Operational Works for North Harbour Boulevard, Roadworks, Stormwater and Earthworks
DA/2023/4731	29 January 2024	Operational Works - Development Permit for Roadworks, Drainage works, Earthworks, Stormwater and Vegetation Clearing (North Harbour Boulevard – Entry Works)
DA/2023/3176	23 January 2024	Reconfiguring a Lot - Development Permit for Subdivision (2 into 25 MIBA Lots plus balance lot - staged)
DA/2024/0933	16 April 2024	Operational Works - Development Permit for Earthworks (North Harbour MIBA – Lot 200)
DA/2023/5175	30 January 2024	Operational Works - Development Permit for Roadworks, Stormwater, Earthworks & Vegetation Clearing (North Harbour MIBA, Stage 3A & 3B)
DA/2023/1759	30 November 2023	Request to Change (Minor) - Operational Works - Development Permit for Traffic Signals
DA/2023/4900	30 January 2024	Operational Works - Development Permit for Roadworks (North Harbour Boulevard signalised intersection)
DA/2023/4299	26 March 2024	Reconfiguring a Lot - Development Permit for Subdivision (1 lot into 189 lots plus balance lot and park in 5 stages)

- Note: Register Current as at 12 May 2024
- Other approvals including operational works for future stages may have been recently approved but are not relevant to the reporting period.

LBEMP Sub-Plan 7

Reference	Approval Date	Description
DA/2021/1112	6 August 2021	Operational Works (Earthworks, Stormwater, Landscaping and Vegetation Clearing)

- Note: No other approvals are required to complete these works.

APPENDIX C: SUPPORTING DOCUMENTATION

Michael McErlean

From: Michael McErlean
Sent: 14 August, 2023 3:14 PM
To: 'EPBC Monitoring'
Cc: Bryan Finney
Subject: EBPC 2023 Compliance Report 2006-2912
Attachments: 2023 Northeast Business Park COMPLIANCE REPORT 2006-2912_v1.0 - FINAL 11 August 2023.pdf

EPBC Compliance Monitoring Team,

Please be advise the latest annual compliance report for the Northeast Business Park project has been completed and a public access link has been placed on our website.

A direct link to the report is included below.

https://www.northharbour.com.au/wp-content/uploads/2023/08/2023-Northeast-Business-Park-COMPLIANCE-REPORT-2006-2912_v1.0-FINAL-11-August-2023.pdf

Regards,
Michael McErlean
Planning & Approvals Manager



Postal Address PO Box 771, Burpengary Plaza, Burpengary Qld 4505

Physical Address 44 Brook Crescent, Burpengary East Qld 4505

m. 0417 884 155 ph. 07 5433 1111 northharbour.com.au



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Michael McErlean

From: EPBC Monitoring <epbcmonitoring@dcceew.gov.au>
Sent: Wednesday, 16 August 2023 7:10 AM
To: Michael McErlean
Subject: RE: EBPC 2023 Compliance Report 2006-2912 [SEC=OFFICIAL]

Dear Michael

Thank you for the submission of the 2023 Annual Compliance Report for EPBC 2006/2912.

The department acknowledges receipt of this submission, and it will be reviewed accordingly.

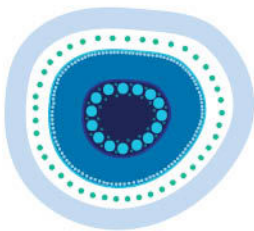
For further information please do not hesitate to contact the EPBC Monitoring Mailbox.

Kind regards,

Warren Griffiths

Compliance and Enforcement Branch | Environmental Permitting and Compliance Division
Department of Climate Change, Energy, the Environment and Water
Ngunnawal Country, John Gorton Building, King Edward Terrace, Parkes ACT 2600 Australia, GPO Box 3090
<mailto:EPBCMonitoring@dcceew.gov.au>

DCCEEW.gov.au ABN 63 573 932 849



Acknowledgement of Country

Our department recognises the First Peoples of this nation and their ongoing connection to culture and country. We acknowledge Aboriginal and Torres Strait Islander Peoples as the Traditional Owners, Custodians and Lore Keepers of the world's oldest living culture and pay respects to their Elders past, present and emerging.

From: Michael McErlean <michael@northharbour.com.au>
Sent: Monday, August 14, 2023 3:14 PM
To: EPBC Monitoring <epbcmonitoring@dcceew.gov.au>
Cc: Bryan Finney <bryan@northharbour.com.au>
Subject: EBPC 2023 Compliance Report 2006-2912

EPBC Compliance Monitoring Team,

Please be advise the latest annual compliance report for the Northeast Business Park project has been completed and a public access link has been placed on our website.

A direct link to the report is included below.

https://www.northharbour.com.au/wp-content/uploads/2023/08/2023-Northeast-Business-Park-COMPLIANCE-REPORT-2006-2912_v1.0-FINAL-11-August-2023.pdf

Regards,

Michael McErlean
Planning & Approvals Manager



Postal Address PO Box 771, Burpengary Plaza, Burpengary Qld 4505

Physical Address 44 Brook Crescent, Burpengary East Qld 4505

m. 0417 884 155 ph. 07 5433 1111 northharbour.com.au



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LEGEND

- NEBP Site Boundary
- LBEMP Sub-plan 07 Extent - Flood Mitigation Works
- LBEMP Sub-plan 06 Extent
 - MIBA (remaining areas) - Bulk Earthworks
 - Raff Creek Crossing & Connection
- LBEMP Sub-plan 05 Extent - Sewer Pump Station SPS-BGY017 (PS3) Reticulation Network
- LBEMP Sub-plan 04 Extent
 - Residential West Area - Balance (Phases 3-7)
 - Borrow Areas
 - Heritage Works
- LBEMP Sub-plan 03 Extent
 - Residential West Area - Phase 2
 - Compensatory Cut / Restoration Area
 - Constructed Wetland
- LBEMP Sub-plan 02 Extent - Residential West Area Phase 1
- LBEMP Sub-plan 01 Extent - MIBA (part of) Vegetation Clearing Works

Scale 1:20 000 - Lengths in metres

200 0 200 400 600 800 1000

SOURCE: Google Earth Oct 2017 Aerial

SCALE: 1 : 20 000 @ A3

JWA Pty Ltd
Ecological Consultants

CLIENT
North Harbour Holdings Pty Ltd

PROJECT
LBEMP Sub-Plan 07
North Harbour Flood Mitigation Works
Nolan Drive, Morayfield QLD
Moreton Bay Regional Council LGA

FIGURE 3

PREPARED: BW
DATE: 05 August 2021
FILE: Q15003_UnnamedCk_20210805.dwg

TITLE

EXTENT OF
CURRENT & PREVIOUS
LBEMP AREAS





2023 - 2024 SUMMARY OF REVEGETATION WORKS

North East Business Park

**A Report Prepared for
North Harbour Holdings Pty Ltd**

AUGUST 2024

DOCUMENT CONTROL

Document

Title	Summary of Revegetation Works
Job Number	Q15003
File Reference	\\JWAServer\Data\2015 CLIENTS\Q15003_Northeast Business Park, Morayfield\Reports\EPBC Rehab Summary (2024)
Version and Date	RW2 06/08/24
Client	North Harbour Holdings Pty Ltd

Revision History (office use only)

Issue	Version	Draft/ Final	Date	Distributed To	No. Copies	Media	Delivery Method
1	RW1	DRAFT	06/08/24	Client	1	.pdf	Email
2	RW2	FINAL	06/08/24	Client	1	.pdf	Email

Client Issue

Version	Date Sent	Author		Approved by	
		Name	Initials	Name	Initials
RW1	06/08/24	Nicole Davies	ND	Adam McArthur	AM
RW2	06/08/24	Nicole Davies	ND	Adam McArthur	AM

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1 Introduction

This summary report discusses the actions taken by Northeast Business Park Pty Ltd towards revegetation of parts of the company's development site "North Harbour" at Morayfield, Queensland. The project site, which was extensively cleared for pine plantation forestry by previous owners, includes frontage to the southern bank of the Caboolture River. Northeast Business Park Pty Ltd is actively seeking to revegetate a 100 m wide native vegetation "riparian buffer" to the Caboolture River on the majority of the frontage. Northeast Business Park would like to thank the following groups and individuals for their assistance in the planning, preparation and establishment of the revegetation works thus far:

- Jim Pulsford, Sue Davies, Alex Smith, and other volunteers from the Friends of CREEC (Caboolture Region Environmental Education Centre);
- Warwick Halse Jr and the staff and volunteers from the CREEC Nursery;
- Wes Mortensen and Seelan Kulasegaram from Moreton Bay Regional Council;
- Staff from Greening Australia;
- Charlie and Jenny Cope;
- Trainees and staff involved in the 2016 and 2017 Skilling Queenslanders for Work program, provided by the Deception Bay Community Youth Programs (DBCYP) organisation; and
- Clint Howchin.

2 Overview of Revegetation Works to Mid 2024

Monitoring of previously planted sections A, B, C, F and G (**SECTIONS 4 - 7**) has been continued, with maintenance in these areas including weed control, fencing repairs and track maintenance. Weed diversity and density throughout the revegetation areas was found to have increased since the previous monitoring visit. Ongoing weed maintenance is required and should be completed as soon as practicable.

Monitoring of natural regeneration trials in section H has continued, with maintenance in this area limited to fencing repairs as required.

Monitoring of natural regeneration elsewhere (i.e. photo monitoring at points 7, 8, 11 and 12) has been discontinued until active planting is undertaken in these areas to establish revegetation.

3 Revegetation Areas Involving Active Planting

Since December 2011, revegetation has been progressively established in a number of locations on the property (upstream end of the project site frontage to the Caboolture River).

Previously, revegetation has been established utilising different methodologies as trials to determine the most effective methodologies for assisted revegetation of the riparian corridor.

Preliminary planning is consistent for all assisted regeneration established thus far because the underlying pre-clearing regional ecosystem is consistent across all areas. Preliminary planning involved:

- Vegetation survey conducted by Sue Davies (Friends of CREEC).
- Revegetation Management Plan prepared by Greening Australia, including documentation of the species planting palette.
- Seed collection and propagation from local sources (including the project site) conducted by the CREEC Nursery.

Based on the observations of seedling survival and growth in previous trial plantings, continuation of planting in section G has been undertaken using the following methods:

- No broadscale soil conditioning / disturbance (as trialled in section A). Limited soil disturbance undertaken to avoid stimulating growth of competing weeds and pasture grasses.
- Ongoing maintenance (through slashing of pasture grasses and weeds, and watering beyond initial establishment) has not been included. Ongoing maintenance undertaken in Section A did not appear to significantly aid the survival and growth of seedlings compared with sections B and C where ongoing maintenance was limited to fencing repairs to exclude grazing by stock.
- Slashing of existing grasses/weeds undertaken just prior to planting (as trialled in sections B and C) has been adopted, providing opportunity for seedlings to establish before being subjected to competition for sunlight.
- Planting palette has been modified to increase the number of seedlings planted from pioneer/hardy species and reduce the number of seedlings planted from secondary species that require protection from the elements via an established upper canopy. Growth rates of secondary species seedlings has been low in area A and B plantings. It is anticipated that secondary species will establish via natural recruitment as fauna species recolonise the revegetated areas. In the event this does not occur, additional planting to introduce these species will be considered once suitable canopy protection has been established.

4 Revegetation Area A

This was the first trial revegetation area planted in December 2011. Canopy height is estimated to have reached approximately 50%, vegetation is now well established, and bird life and other fauna is returning to this area. It is anticipated this area will return to remnant condition without further intervention. Weed diversity and density throughout Area A was found to have increased since the previous monitoring visit. Recent monitoring has identified ongoing weed maintenance is required. **PLATES 1 - 8** show aerial photos of the revegetation progress of Areas A, C and F in June 2024 compared to previous years (May 2012 to April 2023). The progress of Revegetation Area A in July 2024 is shown in **PLATES 9 & 10** compared to previous years (July 2018 to June 2023) shown in **PLATES 11-20**.

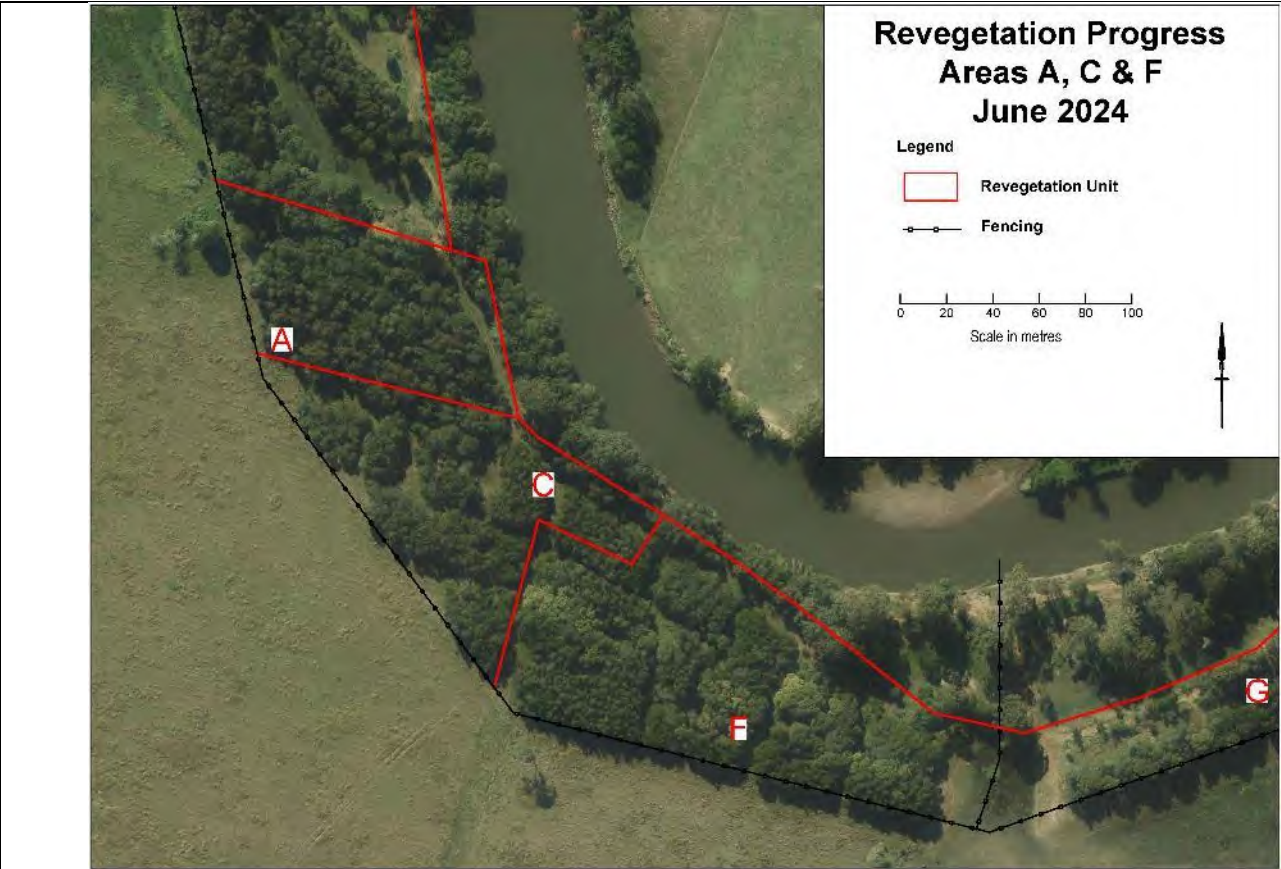


PLATE 1: Aerial of Revegetation progress of Areas A, C and F - June 2024



PLATE 2: Aerial of Revegetation progress of Areas A, C and F - April 2023

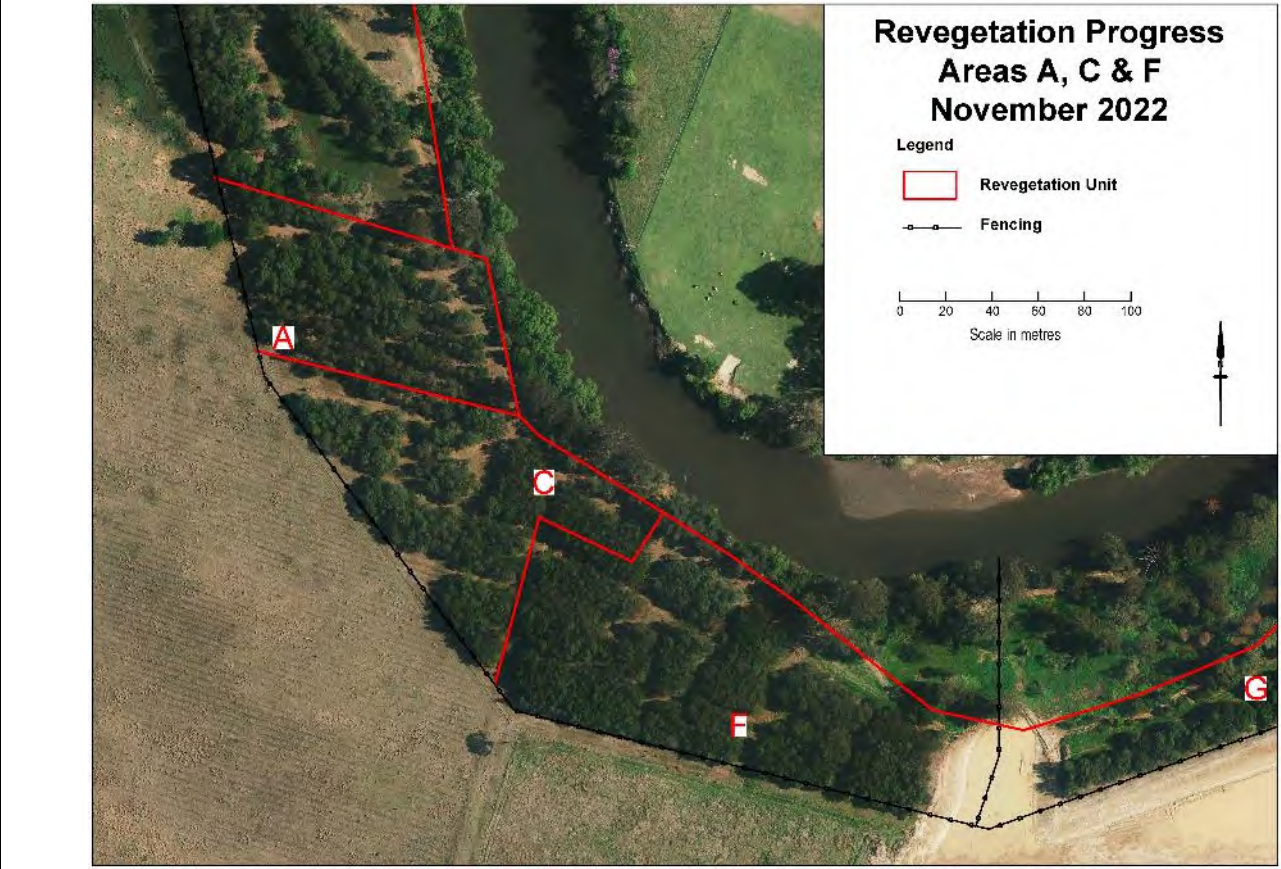


PLATE 3: Aerial of Revegetation progress of Areas A, C and F - November 2022

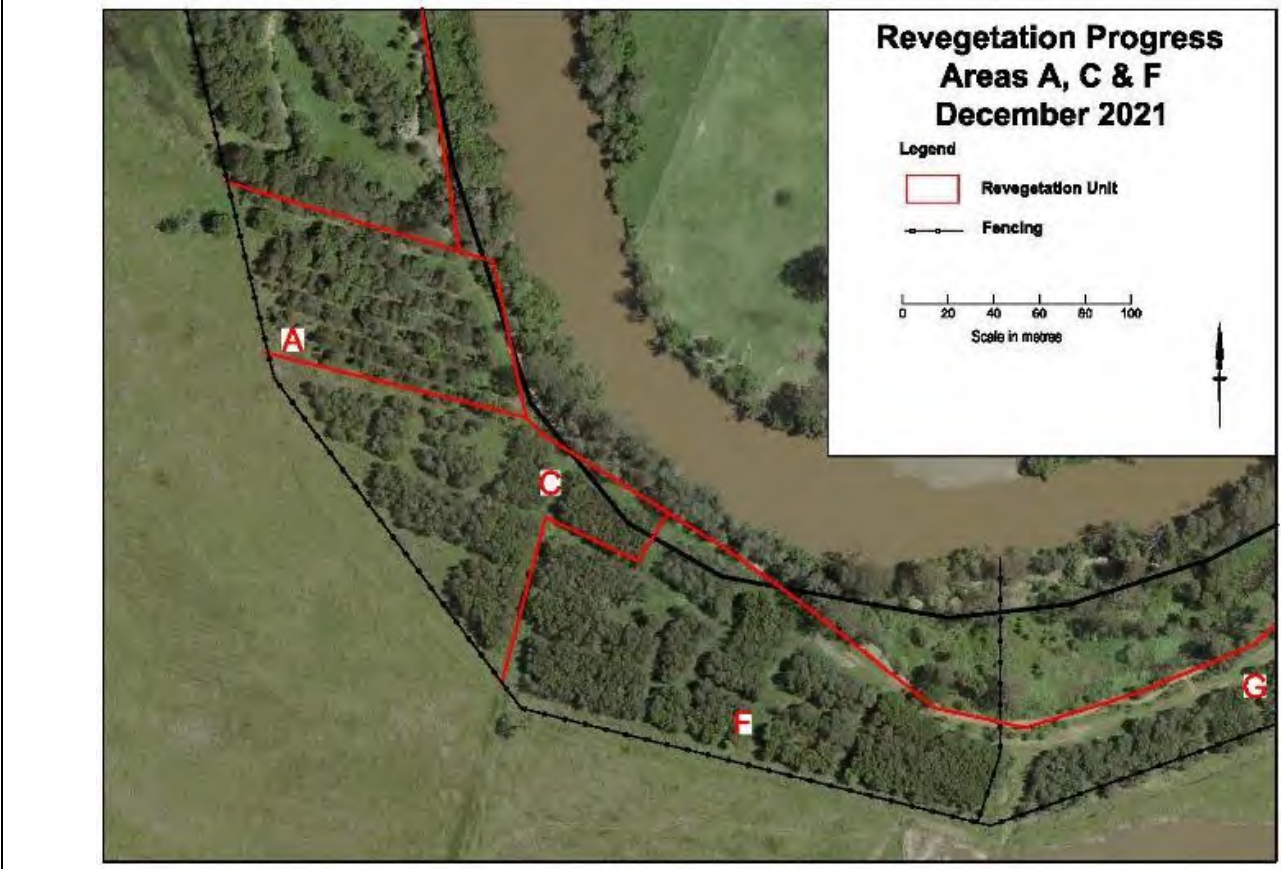


PLATE 4: Aerial of Revegetation progress of Areas A, C and F - December 2021



PLATE 5: Aerial of Revegetation progress of Areas A, C and F - May 2021

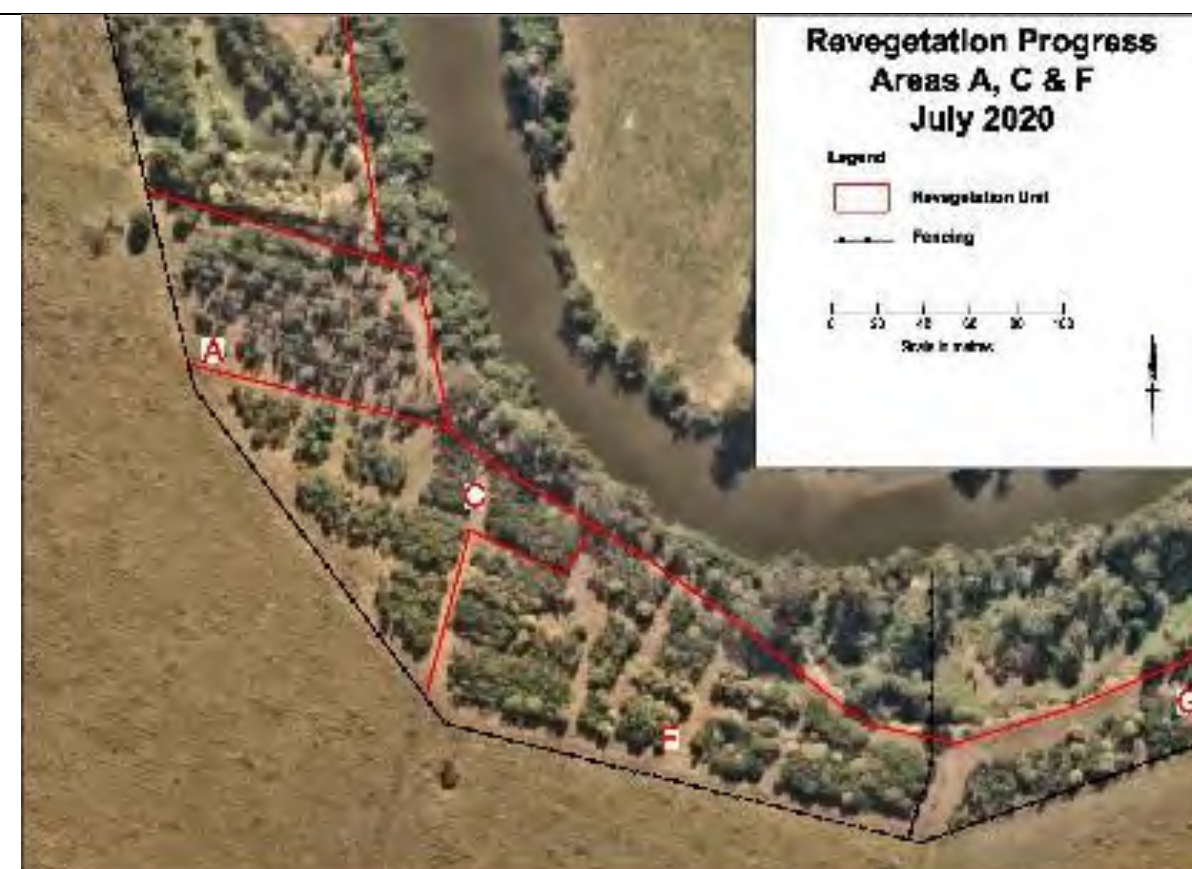


PLATE 6: Aerial of Revegetation progress of Areas A, C and F - July 2020



PLATE 7: Aerial of Revegetation progress of Areas A, C and F - July 2018



PLATE 8: Aerial of Revegetation progress of Areas A, C and F - May 2012



PLATE 9: Revegetation Area A July 2024



PLATE 10: Revegetation Area A July 2024



PLATE 11: Revegetation Area A June 2023



PLATE 12: Revegetation Area A June 2023



PLATE 13: Revegetation Area A June 2022



PLATE 14: Revegetation Area A June 2022



PLATE 15: Revegetation Area A June 2021



PLATE 16: Revegetation Area A June 2021



PLATE 17: Revegetation Area A July 2020



PLATE 18: Revegetation Area A July 2020



PLATE 19: Revegetation Area A July 2018



PLATE 20: Revegetation Area A July 2018

5 Revegetation Area C

Revegetation Area C was planted in March - May 2014. Vegetation in area C has again grown significantly in size as demonstrated by the photos below. Vegetation is now well established and expected to return to remnant status with limited additional intervention. Weed diversity and density throughout Area C was found to have increased since the previous monitoring visit. Follow-up weed maintenance is required in some parts of Area C. **PLATES 1 - 8** show aerial photos of the revegetation progress of Areas A, C and F in June 2024 compared to previous years (May 2012 to April 2023). The progress of Revegetation Area C in July 2024 is shown in **PLATE 21** compared to previous years (June 2017 to June 2023) shown in **PLATES 22-27**.



PLATE 21: Revegetation Area C July 2024



PLATE 22: Revegetation Area C June 2023



PLATE 23: Revegetation Area C June 2022



PLATE 24: Revegetation Area C June 2021



PLATE 25: Revegetation Area C July 2020



PLATE 26: Revegetation Area C July 2018



PLATE 27: Revegetation Area C June 2017

6 Revegetation Area F

Seedlings were planted progressively in area F from late 2015 to May 2016. Seedlings have established well and have significantly increased in size in this reporting period. Weed diversity and density throughout Area F was found to have increased since the previous monitoring visit however. Recent monitoring has identified ongoing weed maintenance is required. **PLATES 1 - 8** show aerial photos of the revegetation progress of Areas A, C and F in June 2024 compared to previous years (May 2012 to April 2023). The progress of Revegetation Area F in July 2024 is shown in **PLATE 28** compared to previous years (June 2017 to June 2023) shown in **PLATES 29-34**.



PLATE 28: Revegetation Area F July 2024



PLATE 29: Revegetation Area F June 2023



PLATE 30: Revegetation Area F June 2022



PLATE 31: Revegetation Area F June 2021



PLATE 32: Revegetation Area F July 2020



PLATE 33: Revegetation Area F July 2018



PLATE 34: Revegetation Area F June 2017

7 Revegetation Area B

Revegetation area B was planted over a 10-month period from February to November 2013. Much of area B has established well and the canopy height is now around 50% of the expected mature height. However, the wetter areas which did not establish well following prolonged inundation shortly after planting are not at the same stage of regeneration. More in-depth monitoring will be undertaken in future to determine if additional action is required to assist regeneration in these wetter areas. Weed diversity and density throughout Area B was found to have increased since the previous monitoring visit. Recent monitoring has identified ongoing weed maintenance is required. **PLATES 35-42** show aerial photos of the revegetation progress of Area B in June 2024 compared to previous years (May 2012 to April 2023). The progress of Revegetation Area B in July 2024 is shown in **PLATES 43 & 44** compared to previous years (July 2018 to June 2023) shown in **PLATES 45 & 54**.



PLATE 35: Aerial of Revegetation progress of Area B - June 2024



PLATE 36: Aerial of Revegetation progress of Area B - April 2023

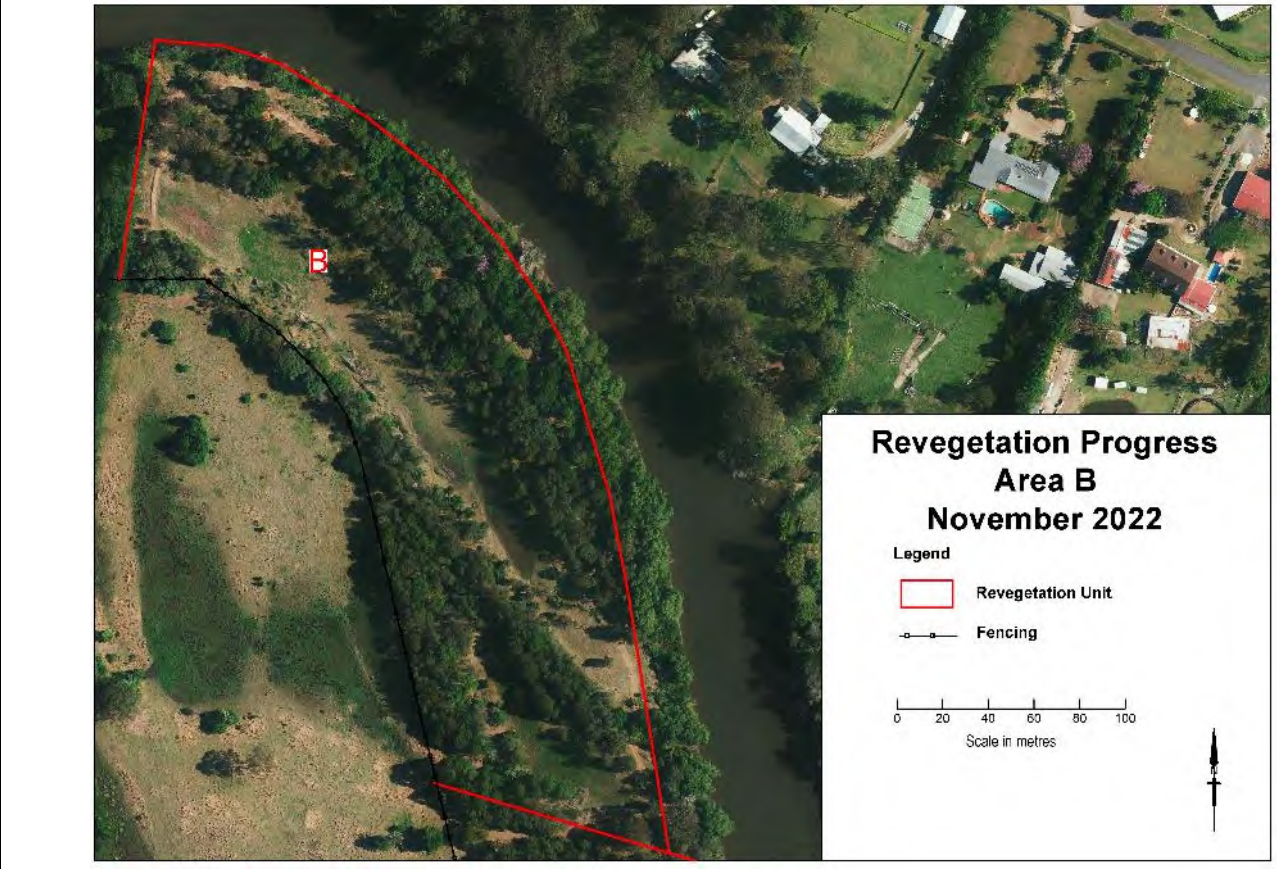


PLATE 37: Aerial of Revegetation progress of Area B - November 2022

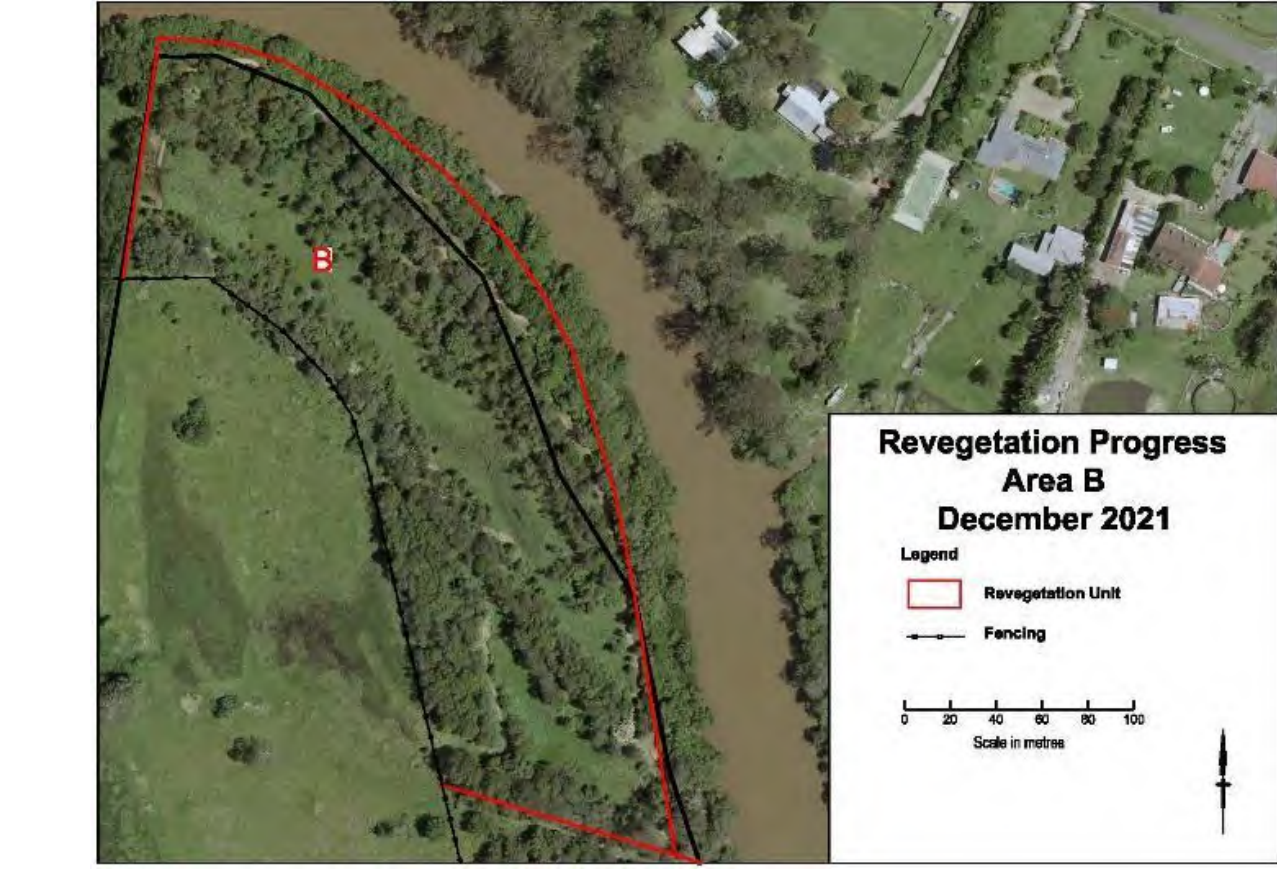


PLATE 38: Aerial of Revegetation progress of Area B - December 2021



PLATE 39: Aerial of Revegetation progress of Area B - May 2021

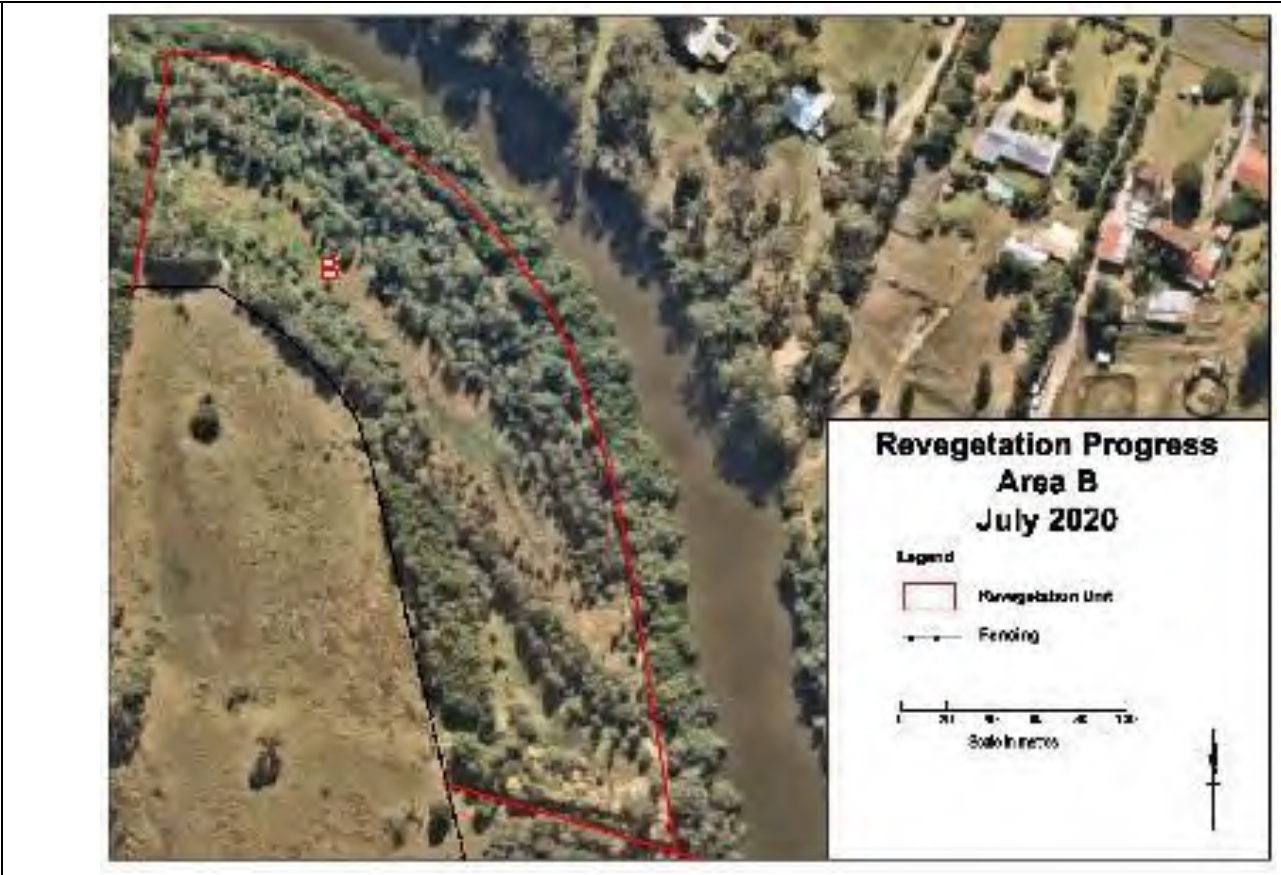


PLATE 40: Aerial of Revegetation progress of Area B - July 2020



PLATE 41: Aerial of Revegetation progress of Area B - July 2018



PLATE 42: Aerial of Revegetation progress of Area B - May 2012



PLATE 43: Revegetation Area B July 2024



PLATE 44: Revegetation Area B July 2024



PLATE 45: Revegetation Area B June 2023



PLATE 46: Revegetation Area B June 2023



PLATE 47: Revegetation Area B June 2022



PLATE 48: Revegetation Area B June 2022



PLATE 49: Revegetation Area B June 2021



PLATE 50: Revegetation Area B June 2021



PLATE 51: Revegetation Area B July 2020



PLATE 52: Revegetation Area B July 2020



PLATE 53: Revegetation Area B July 2018



PLATE 54: Revegetation Area B July 2018

8 Revegetation Area G

Area G was fenced in June 2015. Seedlings have been progressively planted in this large area since June 2015. The last planting in area G was completed by the end of 2018. Seedlings planted in the earlier stages of this area have now established well as shown in the photos below. **PLATES 55 - 62** show aerial photos of the revegetation progress of Area G in June 2024 compared to previous years (May 2012 to April 2023). The progress of Revegetation Area C in July 2024 is shown in **PLATE 63** compared to previous years (June 2017 to June 2023) shown in **PLATES 64- 69**.

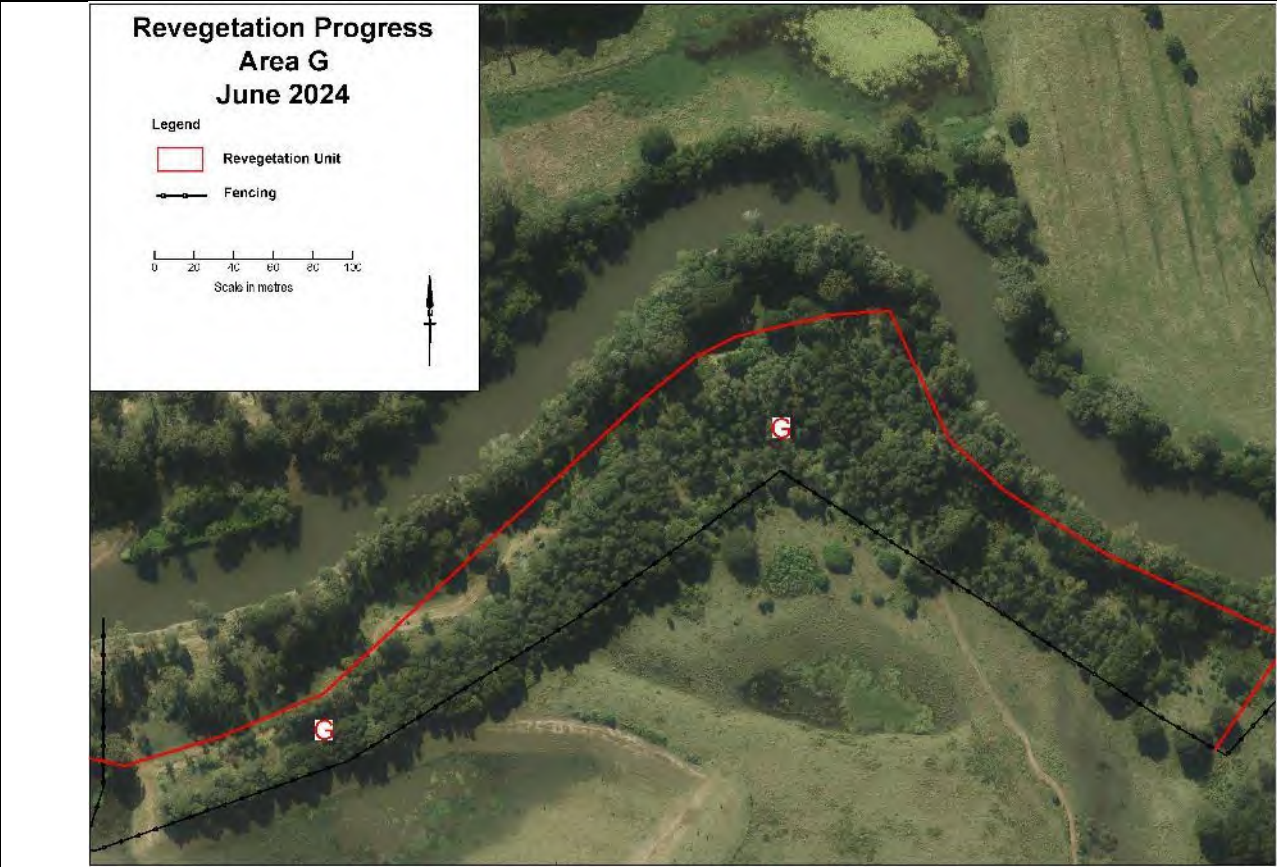


PLATE 55: Aerial of Revegetation progress of Area G - June 2024



PLATE 56: Aerial of Revegetation progress of Area G - April 2023

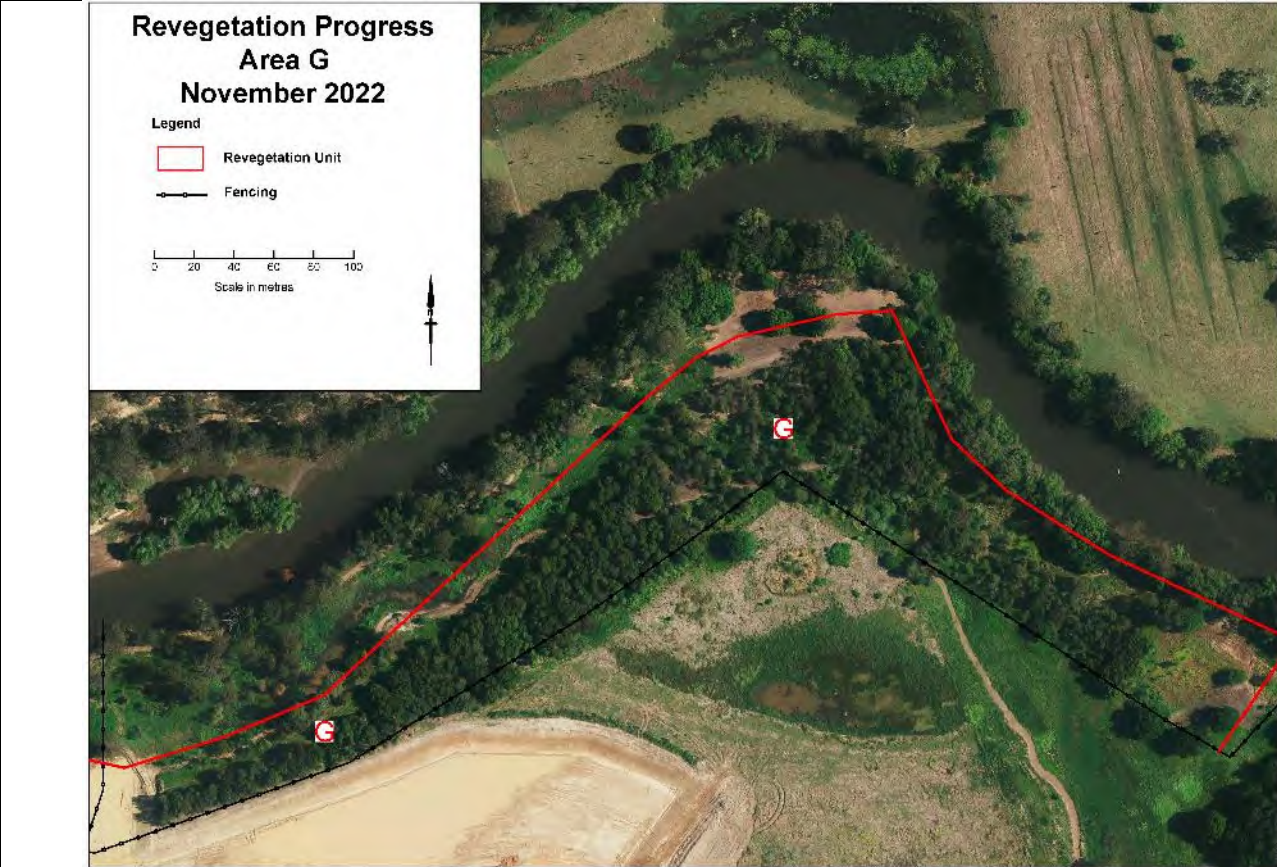


PLATE 57: Aerial of Revegetation progress of Area G - November 2022

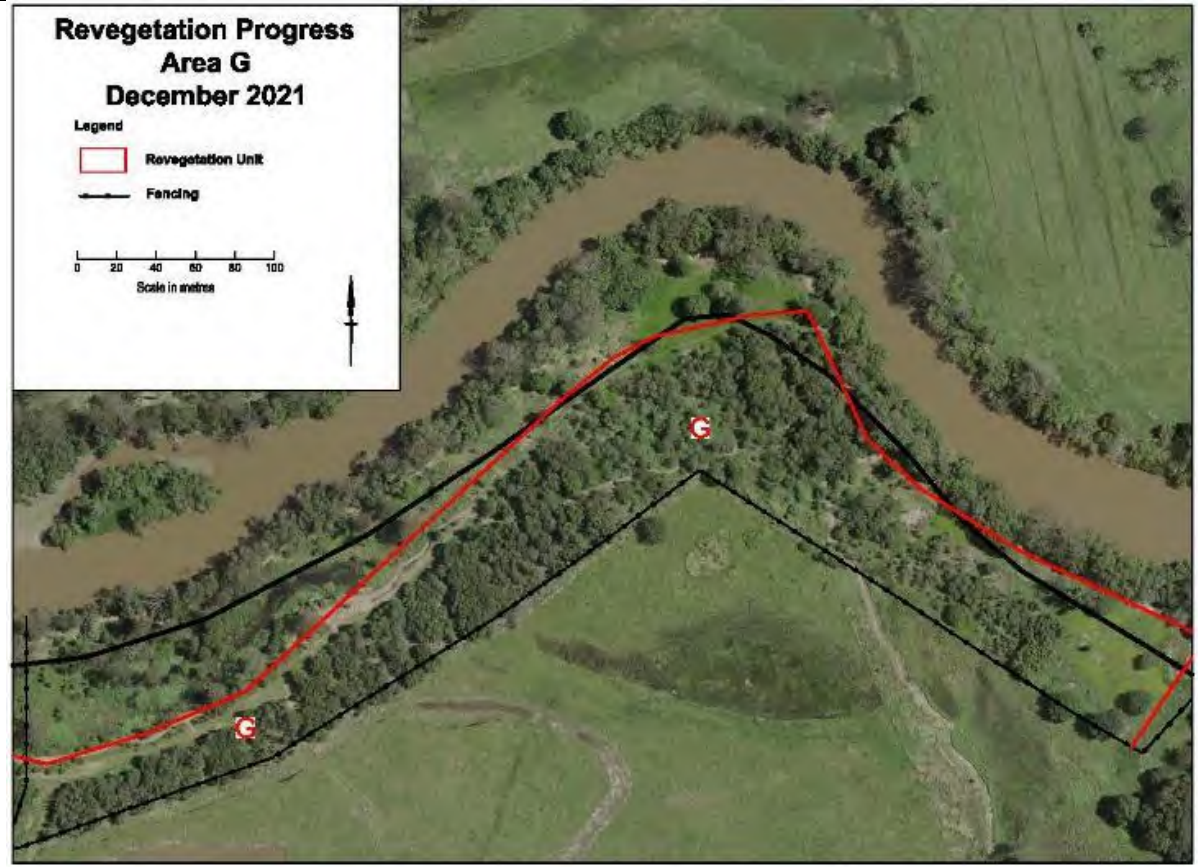


PLATE 58: Aerial of Revegetation progress of Area G - December 2021

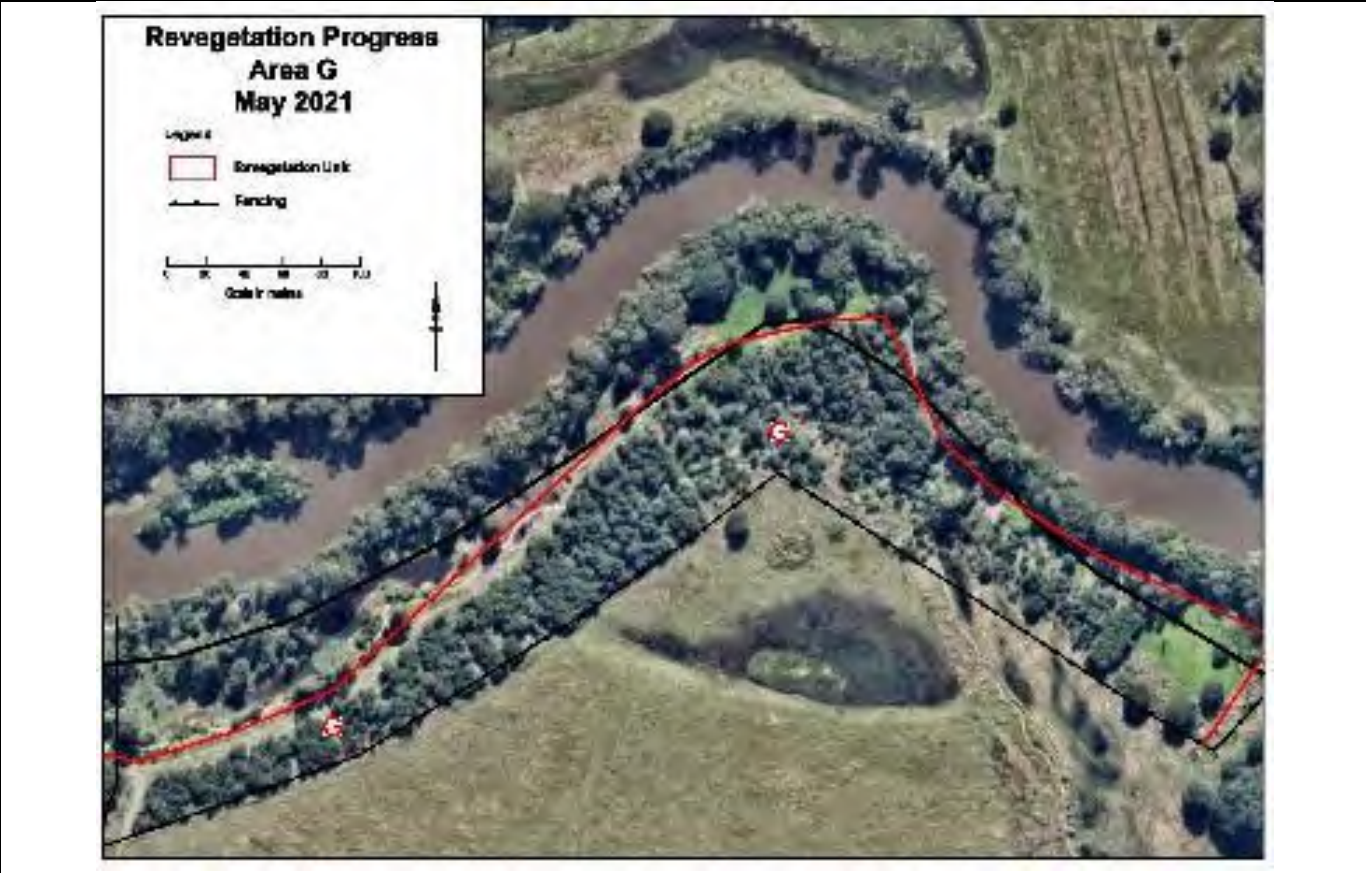


PLATE 59: Aerial of Revegetation progress of Area G - May 2021



PLATE 60: Aerial of Revegetation progress of Area G - July 2020



PLATE 61: Aerial of Revegetation progress of Area G - July 2018



PLATE 62: Aerial of Revegetation progress of Area G - May 2012



PLATE 63: Revegetation Area G July 2024



PLATE 64: Revegetation Area G June 2023



PLATE 65: Revegetation Area G June 2022



PLATE 66: Revegetation Area G June 2021



PLATE 67: Revegetation Area G July 2020



PLATE 68: Revegetation Area G July 2018



PLATE 69: Revegetation Area G June 2017

9 Trials Involving Site Management Actions (Without Active Tree Planting)

In addition to the assisted regeneration involving active planting of seedlings, natural regeneration of area H has continued in the last 12 months. Initially, 5 areas were established to gauge the opportunity for natural regeneration through largely passive approaches whereby changes to management of the onsite farming operation may allow regeneration to occur without significant active planting and maintenance. These trials are summarised below:

- Area D was partly fenced to exclude stock in some sections of the trial. There has been some isolated natural recruitment of seedlings within the fenced area of the trial, however this has not been sufficiently successful to continuation of the trial. Area D will be included in the active revegetation planting activities in future (to be undertaken in future).
- Area F was fenced to exclude stock from the trial area. There has been some isolated natural recruitment of seedlings within the fenced area of the trial, however this was not sufficiently successful to warrant continuation of the trial. Area F has now been actively replanted with seedlings as part of the 2015 - 2016 revegetation works.
- Area G, which is alongside Area F was left unfenced as a trial for natural recruitment within an area in which stock were allowed continued access. No natural seedling recruitment was observed in this area. It has been fenced as part of the 2015 - 2016 revegetation works and continued active replanting with seedlings is ongoing.
- Area E, which is in close proximity to Area D, was left unfenced as a trial for natural recruitment within an area in which stock were allowed continued access. No natural seedling recruitment was observed in this area. The trial has been abandoned and this area will be fenced and actively replanted as part of future revegetation works.
- Area H is a different vegetation type to the other trials, composed of marine plants being mangrove and salt-water couch species. This trial area was partly fenced to observe the difference in seedling recruitment between areas grazed by stock and areas where stock was excluded. Following the success of this trial, additional fencing was erected in 2016. Since then, natural regeneration of casuarina on the land above highest astronomical tide has also been observed along with additional recruitment of mangrove species fringing the river and improvement in the health of salt couch in the occasionally inundated areas.

10 Revegetation Area H

This area is a trial establishing the natural regeneration capacity of marine plant vegetation units on the property. Commenced in February 2014, following success in the fenced trial area additional fencing was erected in 2016 to exclude stock from all parts of area H. In the latest July 2024 monitoring, the gates to Revegetation Area H were open and cattle were present. Pasture grass was encroaching on areas of saltmarsh. **PLATES 70 - 77** show aerial photos of the revegetation progress of Area H in June 2024 compared to previous years (May 2012 to April 2023). The progress of Revegetation Area H in July 2024 is shown in **PLATES 78 & 79**, and compared to previous years (July 2018 to June 2023) in (**PLATES 80-89**).

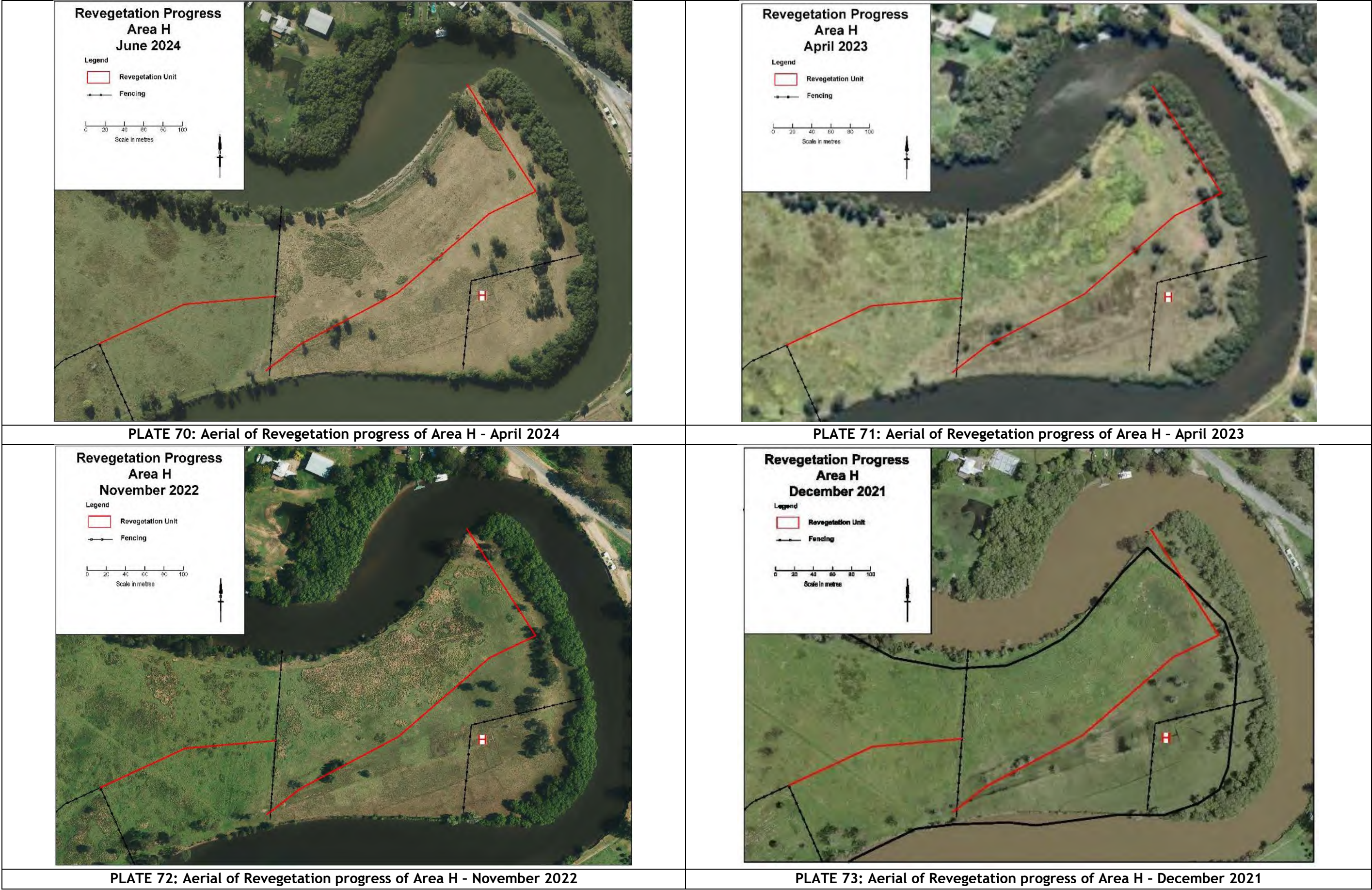




PLATE 74: Aerial of Revegetation progress of Area H - May 2021



PLATE 75: Aerial of Revegetation progress of Area H - July 2020



PLATE 76: Aerial of Revegetation progress of Area H - July 2018



PLATE 77: Aerial of Revegetation progress of Area H - May 2012



PLATE 78: Revegetation Area H July 2024



PLATE 79: Revegetation Area H July 2024



PLATE 80: Revegetation Area H June 2023



PLATE 81: Revegetation Area H June 2023



PLATE 82: Revegetation Area H June 2022



PLATE 83: Revegetation Area H June 2022



PLATE 84: Revegetation Area H June 2021



PLATE 85: Revegetation Area H June 2021



PLATE 86: Revegetation Area H July 2020



PLATE 87: Revegetation Area H July 2020



PLATE 88: Revegetation Area H July 2018



PLATE 89: Revegetation Area H July 2018

11 Photo Point Monitoring

Photo Point Monitoring has continued annually between 2017-2024. To limit the size of this summary report, only 1 photo from each monitoring point has been included in this section of the report. Should you require further photos or other information, please contact Northeast Business Park Pty Ltd. **PLATE 90** provides a plan showing the location of each Photo Point. **PLATE 91** provides a recent aerial (June 2024) showing the location of each current Photo Point.

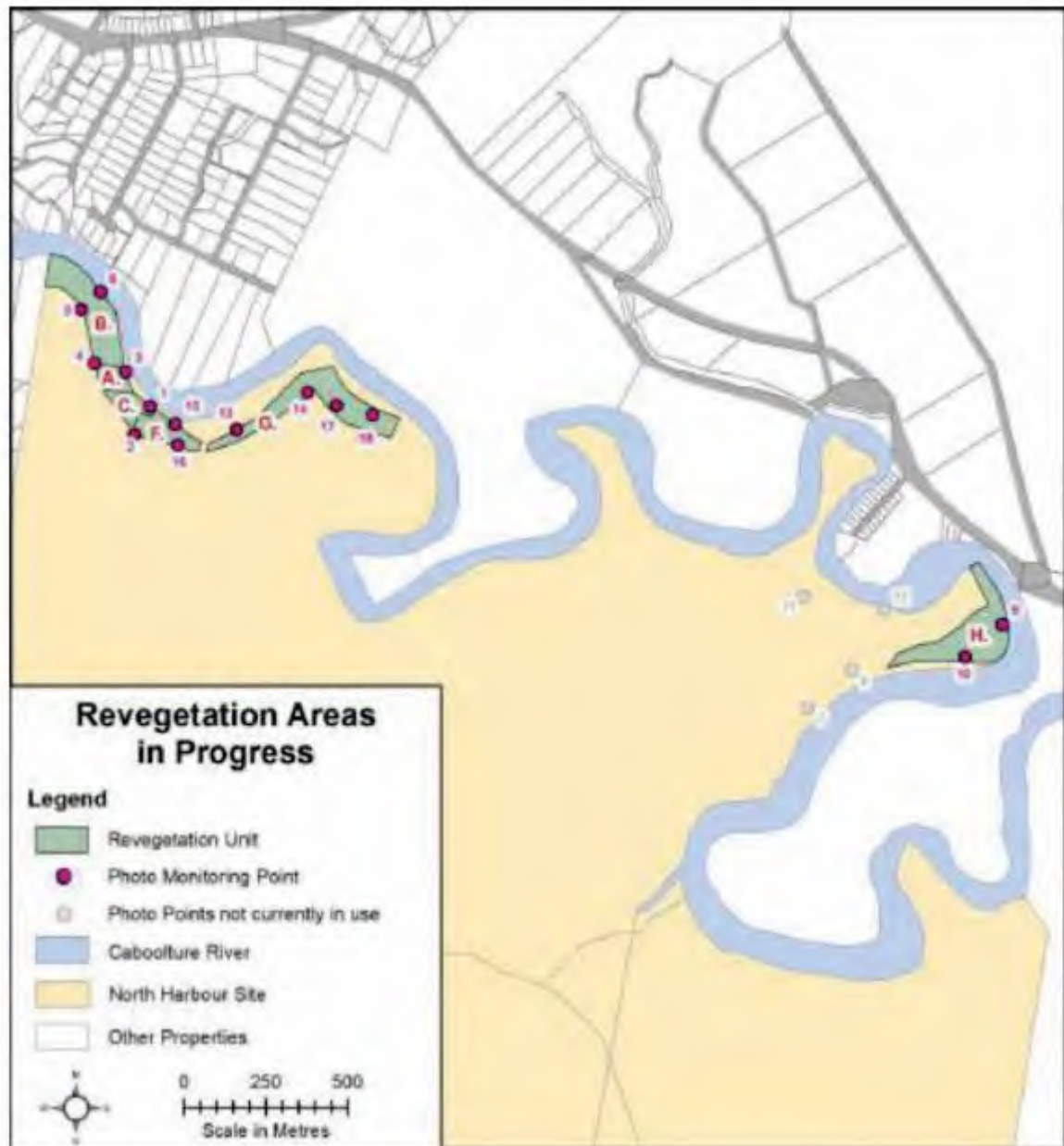


PLATE 90: Revegetation Areas in Progress.



PLATE 91: Recent aerial (June 2024) of Photo Point locations.

PHOTO POINT 1: Revegetation Area C. Primarily exotic pasture grasses that had recently been controlled by cattle grazing. Wild tobacco (*Solanum mauritianum*), exotic forbs and Brazilian nightshade (*Solanum seafortianum*) growing within revegetation area - to be controlled by ongoing weed management.



PHOTO POINT 2: Revegetation Area F. Some exotic grasses and forbs, Giant devil's fig (*Solanum chrysotrichum*), and Blue billygoat weed (*Ageratum houstonianum*), within revegetation area - to be controlled by ongoing weed management.



PHOTO POINT 3: Revegetation Area A. Some exotic grasses, Wild tobacco (*Solanum mauritianum*), Blue billygoat weed (*Ageratum houstonianum*) growing within revegetation area - to be controlled by ongoing weed management. There was evidence of recent weed control with cattle grazing.



PHOTO POINT 4: Revegetation Area A. Primarily exotic pasture grasses, Giant devil's fig (*Solanum chrysotrichum*), Broad-leaved pepper tree (*Schinus terebinthifolia*) - to be controlled by ongoing weed management. There was evidence of recent weed control by cattle grazing.



PHOTO POINT 5: Revegetation Area B. Some exotic grasses, Mile-a-minute (*Ipomoea cairica*), Blue billygoat weed (*Ageratum houstonianum*), Broadleaved pepper tree (*Schinus terebinthifolia*), Wild tobacco (*Solanum mauritianum*), Thickhead (*Crassocephalum crepidioides*), Yellow bells (*Tecoma stans*), Camphor laurel (*Cinnamomum camphora*) and Devil's fig (*Solanum chrysotrichum*) growing within revegetation area - to be controlled by ongoing weed management.



PHOTO POINT 6: Revegetation Area B. Mile-a-minute (*Ipomoea cairica*), Blue billygoat weed (*Ageratum houstonianum*), Broadleaved pepper tree (*Schinus terebinthifolia*), Wild tobacco (*Solanum mauritianum*), and Giant devil's fig (*Solanum chrysotrichum*) growing within revegetation area - to be controlled by ongoing weed management.



PHOTO POINT 9: Revegetation Area H: Exotic pasture grasses encroaching into saltmarsh areas.



PHOTO POINT 10: Revegetation Area H. Exotic pasture grasses encroaching into saltmarsh areas.



PHOTO POINT 13: Revegetation Area G. Some pasture grass, Lantana (*Lantana camara*) and Wild tobacco (*Solanum mauritianum*) growing within rehab area - to be controlled by ongoing weed management. There was evidence of recent weed control with cattle grazing.



PHOTO POINT 14: Revegetation Area G. Some pasture grasses, Blue billygoat weed (*Ageratum houstonianum*), Giant devil's fig (*Solanum chrysotrichum*), Wild tobacco (*Solanum mauritianum*), Lantana (*Lantana camara*), Broad-leaved pepper tree (*Schinus terebinthifolius*) growing - to be controlled by ongoing weed management.



PHOTO POINT 15: Revegetation Area F. Some pasture grasses, Lantana (*Lantana camara*), Wild tobacco (*Solanum mauritianum*), and Blue billy goat weed (*Ageratum houstonianum*) - to be controlled by ongoing weed management.



PHOTO POINT 16: Revegetation Area F. Some pasture grasses and Blue billy goat weed (*Ageratum houstonianum*) - to be controlled by ongoing weed management. There was evidence of recent weed control with cattle grazing



PHOTO POINT 17: Revegetation Area G. Pasture grasses, Giant devil's fig (*Solanum chrysotrichum*), Wild tobacco (*Solanum mauritianum*) and Lantana (*Lantana camara*) - to be controlled by ongoing weed management.



PHOTO POINT 18: Revegetation Area G. Pasture grasses, Singapore daisy (*Sphagneticola trilobata*), Giant devil's fig (*Solanum chrysotrichum*) Camphor laurel (*Cinnamomum camphora*) and Broad-leaved pepper tree (*Schinus terebinthifolius*) throughout area - to be controlled by ongoing weed management.



606-HC2405-D

FAUNA PRE & POST CLEARANCE REPORT

North Harbour, MIBA 1A:605

Burpengary East, QLD 4505



Prepared for:
Hall Contracting Pty Ltd

Delivered:
August 2024



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Document Control Information

Report Title:	Pre- and Post Clearance Report
Prepared For:	Hall Contracting Pty Ltd
Report Reference:	606-HC2405-D
Project Address:	North Harbour, MIBA 1A:605 - Burpengary East, QLD 4505

Document Review and Distribution

Document Version	Issued to	Author	Reviewed/Approved	Date
Rev 0	Hall Contracting Pty Ltd	AK	YV	08/08/24

Document Approval

Approvals	Title	Signature
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Authority

This report has been prepared for use to manage staff and subcontractors relevant to the management and protection of the environment during the Project works. Its application is authorised as part of the client undertaking works. The issue and revision of this report are made under the authority of the Project Manager.

Reports and/or Plans

Assessment reports and drawings provided by the client have been used for the development of this report to support the document.

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1 Introduction

1.1 Background

Australia Wide Environmental Consultants (AWEC) were commissioned by Hall Contracting Pty Ltd ('the Client') to prepare a Pre-and Post-Clearance Report associated with vegetation clearing located at Burpengary East, QLD 4505, hereafter referred to as the Project.

In addition, AWEC provided a Department of Environment and Science (DES) licensed fauna spotter catch (FSC) to undertake a pre-clearance field survey and supervise the vegetation clearing activities.

It is understood the scope of work includes vegetation clearing undertaken for an access bridge (central GPS location -27.1158132, 152.9957092), as shown in **Figure 1** below, referred to as the 'survey area' located within the Project.

This report provides a summary of the pre-and post-clearance results conducted on May 24th and July 26th, 2023, as well as management actions undertaken before and during vegetation clearing activities.

1.2 Scope of Fauna Management

The field survey was conducted on foot to achieve the following objectives:

1. Identify and mark GPS coordinates of any potential habitat and breeding sites for terrestrial, arboreal, and aquatic fauna likely to be impacted by clearing and construction works (e.g., tree hollows, burrows, nests, arboreal termite nests, mulch and rockpiles, and waterbodies).
2. Provide a recommended strategy to aid in the avoidance and/or mitigation of impact by vegetation clearing to conservation significant fauna species and other native fauna.

AWEC implemented a process methodology for the management of fauna and habitat in accordance with the following legislation, guidelines, and project-specific documents (as outlined in **Table 1.2.1**).

Table 1.2.1 Legislations, Guidelines, And Project-Specific Documents

Document Title	Purpose of Legislation
Animal Care and Protection Act 2001	The Queensland Animal Care and Protection Act 2001 (the Act) promotes the responsible care and use of animals.
Biosecurity Act (2014)	The Biosecurity Act 2014 provides a framework for an effective biosecurity system for Queensland, to ensure the safety and quality of agricultural inputs, and to align responses to biosecurity risks in the state with national and international obligations.
Environmental Offsets Act (2014)	The main purpose of this Act is to counterbalance the significant residual impacts of particular activities on prescribed environmental matters through the use of environmental offsets.
Environmental Protection Act (1994)	The Environmental Protection Act 1994 (EP Act) lists obligations and duties to prevent environmental harm, nuisances, and contamination.

Table 1.2.1 Legislations, Guidelines, And Project-Specific Documents

Document Title	Purpose of Legislation
Environment Protection and Biodiversity Conservation Act (1999)	The EPBC Act 1999 focuses on Australian Government interests in the protection of matters of national environmental significance, with the states and territories having responsibility for matters of state and local significance.
Nature Conservation Act 1992 (NC Act)	The Nature Conservation Act 1992 (the Act) provides the legislative basis for the conservation of nature through the dedication, declaration and management of protected areas and the protection of native wildlife and its habitat.
Nature Conservation (Animals) Regulation (2020)	The Nature Conservation (Animals) Regulation 2020 (Animals Regulation) introduces a new wildlife licensing framework but incorporates and streamlines existing provisions from the regulations that it replaces.
Nature Conservation (Koala) Conservation Plan (2017)	The main purposes of this plan are— (a) to promote the continued existence of viable koala populations in the wild; and (b) to prevent the decline of koala habitats.
Nature Conservation (Plants) Regulation 2020	The regulatory framework captures clearing and harvesting activities that pose a significant risk to plant biodiversity.
Vegetation Management Act 1999 (VMA)	The Vegetation Management Act 1999 regulates the clearing of vegetation in Queensland in a way that conserves remnant vegetation, ensures clearing does not cause land degradation, prevents loss of biodiversity, maintains ecological processes, reduces greenhouse gas emissions, and allows for sustainable land use.
Water Act 2000 (Qld)	The Water Act 2000 (Qld) (Water Act) provides a framework for the planning, allocation and use of surface water and groundwater in Queensland.

2 Permits and Reporting

AWEC currently holds and operates under a DES Rehabilitation Permit for Spotter Catcher Activity, Permit No. WA0055123 and a Damage Mitigation Permit (removal and relocation of wildlife), Permit no. WA0054928, licensed in the State of Queensland.

Clearing activities that are likely to tamper with breeding places of least concern species (excluding special least concern) are to be undertaken in accordance with the project-specific endorsed Species management program (SMP) for tampering with animal breeding places (Low risk of impacts).

The following information relates to data to be collected regarding the relocation of fauna which will be submitted to the Department of Environment and Science (DES) as part of the Animal Breeding Places Register returns:

- Fauna species relocated.
- Location of animal breeding place.
- Location of release.
- Date of relocation.

3 Desktop Assessment

Prior to commencing the pre-clearing survey, all previous Project surveys and management plans related to the survey area were reviewed, as well as an extensive desktop assessment of the survey area (refer to **Figure 1**).

The initial assessment for the vegetation clearing activities consisted of a desktop review of publicly available ecological data sources and information on the survey area. The desktop review was followed by an on-ground field survey in conjunction with the pre-clearance field survey to describe the ecological values present and to aid the evaluation of the potential impacts of the Project on identified habitat values.

The following data sources were used to inform the desktop assessment for the survey area:

3.1 Regional Ecosystem Map

The Queensland DNRME Vegetation Management Regional Ecosystem (RE) Map was viewed to determine the extent, type, and status of REs mapped within the survey area.

The existing vegetation within the survey area contains the following Regional Ecosystems:

- 12.3.20 Non-remnant vegetation
- 12.1.2 Least concern vegetation
- 12.1.3 Least concern vegetation
- 12.1.1 Of concern vegetation
- 12.3.6 Least concern vegetation

The following prescribed environmental matters are identified as occurring within the survey area of the Project:

- MSES high ecological significance wetlands

In close proximity to:

- MSES wildlife habitat [endangered or vulnerable]

Schedule 2 of the Environmental Offsets Regulation 2014 outlines a list of prescribed environmental matters that are considered matters of state environmental significance (MSES).

3.2 South-East Queensland Koala Mapping

The Department of Environment and Science (DES) released new regulatory koala habitat maps that support the implementation of the South-East Queensland Koala Conservation Strategy 2020–2025 and amended koala conservation protections within the planning framework. It identifies the best quality koala habitat based on modelling of biophysical measures, suitable vegetation for food and shelter, and two decades of records of koala sightings.'

The survey area contains the following:

- Koala habitat restoration area.

3.3 Protected Plants Flora Survey Trigger Map

The Department of Environment and Science (DES) Protected Plants Flora Survey Trigger Map spatial layer was viewed to determine if the vegetation within the survey area is in proximity to a record of a conservation significant flora species.

- The survey area does not trigger the Protected Plants Flora Survey Trigger Map.

3.4 Protected Matters Search Tool

The Department of Agriculture, Water, and the Environment (DAWE) Protected Matters Search Tool (PMST) was used to identify nationally listed species and communities that are predicted to occur in the survey area, based on knowledge of species distributions, habitat requirements and preferences. A 1 km buffer zone around the survey area was used for the PMST report.

3.5 Wildlife Online Database

The Queensland Government Wildlife Online database was used to retrieve historical records of flora and fauna species listed under the NC Act previously observed within a 1 km radius of the central coordinates of the survey area.

- The results of the Wildlife Online Extract listed four (4) fauna species within a 1 km radius of the survey area and are displayed in **Table 3.5.1**

Table 3.5.1 Wildlife Online Results	
State-Listed Threatened Species	Conservation Status
Koala (<i>Phascolarctos cinereus</i>)	Endangered
Whitethroated Needletail (<i>Hirundapus Caudacutus</i>)	Vulnerable
Eastern Osprey (<i>Pandion Haliaetus Cristatus</i>)	Special Least Concern
Australian Lungfish (<i>Neoceratodus forsteri</i>)	Vulnerable

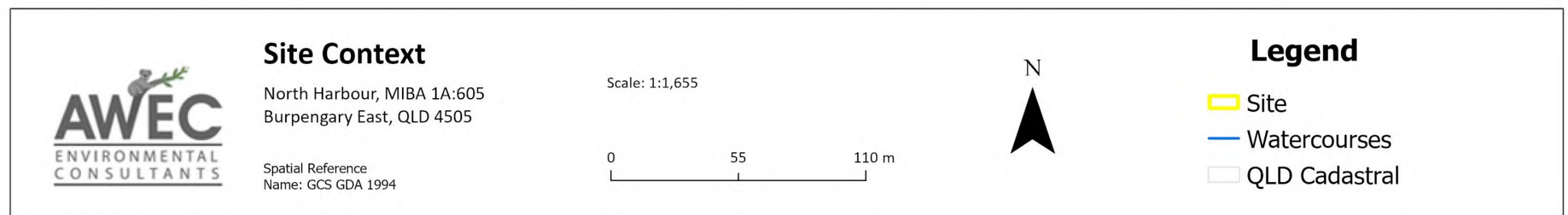


Figure 1. Survey area displaying limits of clearing (Indicative Only).

4 Field Survey

4.1 Survey Methodology

The field survey was carried out by two (2) Suitably Qualified and Experienced Persons (fauna) on May 24th and July 26th, 2023. The following survey methodologies were employed to identify habitat features and fauna requiring further management action (**Table 4.1.1**).

Table 4.1.1 Survey Methodologies

Survey Type	Survey Methodology
Track, scat and sign searches	In the form of footprints and tracks, scats, feeding marks on trees, hairs, feathers, bones, slough, nests, feeding stations and carcasses and incidental surveys
Destructive searches	For indications of occupancy of rocky outcrops, hollow logs, peeling bark, scattered timber, burrows, soil cracks, termite mounds, ground nests, shrubs, leaf litter and grasses
Conduct hand searches	For any terrestrial fauna including high-risk species listed as special least concern, migratory or colonial species and fauna species of conservation significance likely to be impacted by clearing and construction works
Visual searches	For indications of occupancy of nests, hollows, exfoliating bark, fissures, dreys and arboreal termitaria
Aquatic assessment (if applicable)	Of occupancy indicators including amphibian calls or breeding signs, slide marks, burrows or tracks on banks, nesting sites for fish, and breaks in surface tension or bubbles
Opportunistic surveys (if applicable)	To assess the presence of conservation significant flora species likely to occur within areas mapped under the protected plants flora trigger overlay

All features and environmental weed species (if applicable) were located using a GPS Kit and the location coordinates were recorded and marked on-site. A description of the above features and environmental weed species (if applicable) was recorded and entered into an electronic database. Representative photographs were taken and stored for reference purposes.

4.2 Survey Area

The survey area runs adjacent to Gympie Creek and consists of She-oak (*Casuarina*) and grey mangrove (*Avicennia marina*) vegetation which will require clearing for an access bridge.

A small segment of riparian bushland borders the brackish creek characterised by dense vegetation. The canopy is primarily composed of Australian blackwood (*Acacia melanoxylon*), Swamp she-oak (*Casuarina glauca*), and a variety of mangrove species.

The ground cover within the survey area is sparse. However, there are several patches of invasive species, including Lantana (*Lantana camara*) and Broad-leaf pepper tree (*Schinus terebinthifolia*) scattered throughout the region.

Photographs of the general vegetation observed within the survey area are displayed in **Figures 2 - 5**.



Figure 2. General survey area of dense trees



Figure 3. Clearing South side of Gympie Creek



Figure 4. Gympie Creek running through clearing limits



Figure 5. General survey area of ground and tree cover

4.3 Survey Results

The survey area provides medium habitat potential, and opportunistic habitat for fauna species such as wallabies, possums, birds, and reptiles and acts as a temporary refuge for fauna moving within the local area.

No (0) signs of conservation significant fauna species, or breeding places were observed during the field survey.

The fauna biodiversity observed within the survey area during the field survey is listed below in **Table 4.3.1**.

Table 4.3.1 Fauna Biodiversity			
Common Name	Scientific Name	NCA Status	Count
Lewin's Honeyeater	<i>Meliphaga lewinii</i>	Least Concern	1
Brown Honeyeater	<i>Lichmera indistincta</i>	Least Concern	1
Eastern Great Egret	<i>Ardea alba modesta</i>	Least Concern	1
Little Pied Cormorant	<i>Microcarbo melanoleucos</i>	Least Concern	1

Table 4.3.1 Fauna Biodiversity

Common Name	Scientific Name	NCA Status	Count
Australian Magpie	<i>Gymnorhina tibicen</i>	Least Concern	1
White-Bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Least Concern	1
Black Swan	<i>Cygnus atratus</i>	Least Concern	1
Torresian Crow	<i>Corvus orru</i>	Least Concern	1
Total			8

No (0) habitat features, or fauna signs were recorded during the survey and displayed in **Table 4.3.2**.

Table 4.3.2 Habitat Features & Fauna Signs

Habitat Features	Count
Bird Nest	0
Possum Drey	0
Dam/waterbody (Aquatic Habitat)	0
Arboreal Termite Mound	0
Habitat Tree (DBH > 80 cm)	0
NJKHT	0
Dense Veg	0
Fissured Bark	0
Hollow-Bearing	0
Stag Trees	0
Rocky Outcrops	0
Woody Debris	0
Total:	0 Habitat Features

Table 4.3.2 Habitat Features & Fauna Signs

Fauna Signs	Count
Diggings	0
Scat	0
Tracks	0
Scratch Marks	0
Native Beehive	0
Total:	0 Fauna Signs

5 Vegetation Clearing and Fauna Management

5.1 Clearing Activities & Strategies

Prior to the commencement of vegetation clearing, the DES-licensed FSC conducted searches of habitat features including thick vegetation, ground debris and burrows for potential or active breeding places of fauna and conservation significant fauna species. All GPS locations and representative photographs were taken and stored for reference purposes.

Machines used for vegetation clearing were supervised by a DES-licensed FSC at a ratio of one FSC per machine, with constant positive communication upheld between the FSC and the operator. This ensured any fauna sighted during the clearing activities was able to be safely captured and relocated.

Management strategies included directional and controlled felling as a mitigation measure to reduce impacts on arboreal fauna and to allow opportunistic terrestrial fauna to disperse into suitable areas. Before larger vegetation was removed it was gently rustled with machinery to see if any fauna would disperse from the vegetation to minimise fatality from cutting it down. Felled trees were inspected on the ground by the FSC prior to mulching, which was conducted immediately on-site.

Photographs of vegetation clearing activities conducted are displayed in **Figures 6- 9**.



Figure 6. Prior to Clearing Works



Figure 7. During Clearing Works



Figure 8. During Clearing Works



Figure 9. Post Clearing Works

5.2 Fauna Interactions

No (0) signs or sightings of conservation significant fauna species were identified during the clearing activities.

No (0) fauna interactions were recorded throughout clearing activities and are listed in **Table 5.2.1**.

Table 5.2.1 Fauna Interaction Details

Date	#	Scientific Name	Common Name	Capture Location Lat / Long	Release Location Lat / Long	Condition, Incidents, Treatment
NA	NA	NA	NA	NA	NA	NA
TOTAL		0 Species				

5.3 Breeding Places

No breeding places were observed within the survey area during clearing activities.

Active breeding places identified during clearing activities are listed below in **Table 5.3.1**.

Table 5.3.1 Breeding Place						
Date	#	Type	Species	Capture Lat / Long	Release Lat / Long	Comments
NA	NA	NA	NA	NA	NA	NA
TOTAL		0 Active Breeding Place				

6 Conclusion

A pre-clearance field survey was conducted to determine risk and management strategies for fauna management throughout clearing activities undertaken by Hall Contracting Pty Ltd ('the Client').

No (0) sightings of conservation significance fauna species, or breeding places were observed within the survey area during the pre-clearance field survey or during the clearing activities. No habitat features and fauna signs were identified across the survey area and recorded.

No (0) fauna interactions or fatalities occurred during the clearing process.

Fauna management throughout the course of vegetation clearing activities on May 24th and July 26th, 2023, was considered to be effective in reducing the risk of native fauna fatality.

AWEC can confirm all activities, including vegetation clearing and fauna spotter-catching, were carried out in accordance with the relevant environmental legislation, Project conditions, Project-specific environmental management plans, and the recommendations of in-field ecologists and fauna specialists.

3 July 2024

Project No. 19210-034-Rev0

Mr Michael McErlean
North East Business Park Pty Ltd

Email: michael@northharbour.com.au

ENVIRONMENTAL MONITORING SUMMARY – MAY 2023 TO MAY 2024 NORTH HARBOUR DEVELOPMENT

Dear Michael,

1.0 INTRODUCTION

Tectonic was engaged by North Harbour Holdings Pty Ltd (NHH) to prepare this report summarising the acid sulfate soil (ASS) management and associated groundwater monitoring completed between May 2023 to May 2024 related with ongoing land development at *North Harbour*.

1.1 Background

Tectonic has provided ongoing ASS and groundwater management advice on behalf of North Harbour since 2017. Implementation of ASS management strategies during development (including ASS treatment, verification testing and other services pertaining to general site management) are undertaken by the Primary Contractor, Hall Contracting Pty Ltd (Hall) and their various subcontractors, the details of which have been provided to Tectonic for inclusion herein.

Soil and water management pertaining to ASS, for respective development components, is completed in general accordance with the following approved management documents:

- North East Business Park - Residential West, *Acid Sulfate Soil Investigation Report and Management Plan (Revision 8)*, prepared by Coffey Geotechnics Pty Ltd (Report No. GEOTKPAR01976AC-D(Rev8), dated 22 December 2015).
- North Harbour Residential West - Balance Phase Residential Earthworks, *Addendum to ASSMP*, prepared by Coffey Geotechnics Pty Ltd (Report No. GEOTKPAR01976AJ-D, dated 22 December 2016).
- *Acid Sulfate Soil Investigation and Management Plan*, North Harbour Mixed Industry and Business Area (MIBA), prepared by Tectonic (Report No. 19210-001-Rev0, dated 8 November 2019).
- *Addendum to Acid Sulfate Soil Management Plan*, Proposed Sports Fields Bulk Earthworks; North Harbour Mixed Industry and Business Area (MIBA), prepared by Tectonic (Report No. 19210-032-Rev0, dated 31 October 2023).

2.0 SUMMARY OF SITE DEVELOPMENT

Works undertaken during the reporting period (May 2023 to May 2024) included ongoing earthworks and civil works associated with two separable development areas. These being the balance of works at North Harbour *Residential West* and ongoing bulk earthworks for development of North Harbour *Mixed Industry and Business Area (MIBA)*.

Works carried out within each of the major development areas during the summary period included:

North Harbour Residential West

- Bulk Earthworks: All bulk earthworks were completed prior to May 2022.
- Civil Construction: Completion of Stages 33, 39, 40A, 40C, 41.

Works associated with the remaining balance stages of North Harbour Residential West, including those completed throughout the summary period, have been previously assessed and do not pose significant ASS risk. These works have therefore not required specific soil treatment or groundwater monitoring as part of the ongoing development.

North Harbour Mixed Industry and Business Area (MIBA)

- General Bulk Earthworks:
 - Area M7 - 86,000 m³ cut (to fill in Area RN4). Non-acidic soil / Non-ASS.
 - Area RN4 - 7500 m³ cut to fill. Non-acidic soil / Non-ASS.
 - Area RN7 - 4500 m³ cut to fill. Non-acidic soil / Non-ASS.
 - Area M2, M3 & M7 – 55,000 m³ cut to fill. Non-acidic soil / Non-ASS.
 - Raff Creek – Landscape trimming 4500 m³ cut (to fill in Area RN4). Material treated at 100 kg/m³ and verified.
- Civil Construction:
 - Commencement in Stages 1A, 3A & 3B.
 - Trunk Water Main (Stage 3A).

All excavated materials have been placed as controlled fill within approved MIBA fill zones, following treatment, validation testing and moisture conditioning, where necessary.

2.1 Long-term Site Development

General timing of past and future earthworks phases and civil construction works at North Harbour is summarised in Table 1. Summary reports for previous yearly reporting periods prior to June 2023 have been prepared and previously submitted to the administering authority.

Table 1: Sequence of Bulk Earthworks and Civil Construction

Area	Residential West			MIBA				
Phase	Bulk Earthworks	Civil Construction		Bulk Earthworks			Civil Construction	
Stage No. Works Area	All Phases	1-32, 34-38	33, 39, 40 & 41	Wetlands 1, 2, 3 & 4	Raff Creek Bridge	General Earthworks (Non-ASS & ANS Zones)	Stages 1A, 3A & 3B	Future Stages
Pre-2023								
2023/2024								
Ongoing / Future Works								

3.0 GROUNDWATER MONITORING

Bulk earthworks for completion of *Residential West* required no soil treatment or groundwater monitoring between May 2023 and May 2024.

Bulk earthworks for the *MIBA* commenced at the start of March 2021.

Groundwater monitoring associated with identified ASS zones within the *MIBA* development was completed by Tectonic on behalf of North Harbour in accordance with the approved ASSMP for the works.

Preconstruction monitoring was completed between November 2020 and February 2021.

Bulk earthworks associated with development of Wetlands 1, 2 and 3, and the Buchanan Road Drainage Reserve were completed in November 2022, with post-construction phase groundwater monitoring associated with these areas (i.e. GWB102, GWB107 and GWB108) ceased at the end of May 2023.

Bulk earthworks for construction of Wetland 4 and for construction of the Raff Creek bridge were completed in May 2023, with post-construction monitoring at groundwater monitoring locations GWB103, GWB104, GWB105 & GWB106 carried out until the end of October 2023.

Remaining works associated with MIBA development are generally within soils which have been characterised as non-acid sulfate soil (non-ASS) or acidic non-sulfuric (ANS) soil, where the environmental risk of acid migration is relatively low.

Monitoring frequencies and testing regimes have been completed in accordance with the respective ASSMP documents for each package of work. Results of groundwater monitoring were regularly assessed and have been reported monthly to provide regular updates to NEBP on groundwater quality associated with the works and to note any impacts which may be attributed to disturbance of ASS. A summary of the groundwater monitoring reports completed for the MIBA works phases is provided in Table 2.

Table 2: Groundwater Quality Monitoring & Respective Monthly Reports (June 2023 to May 2024)

Report No.	Monthly Period	Works Package & Monitoring Phase
19210-028 (Tectonic)	June 2023	MIBA - Post-construction Monitoring
19210-029 (Tectonic)	July 2023	MIBA - Post-construction Monitoring
19210-030 (Tectonic)	August 2023	MIBA - Post-construction Monitoring
19210-031 (Tectonic)	September 2023	MIBA - Post-construction Monitoring
19210-033 (Tectonic)	October 2023	MIBA - Post-construction Monitoring

As per the recommendations of the ASSMP and associated documents, median values of groundwater quality parameters have been compared with 80th and 20th percentile baseline values attained during pre-construction monitoring. It is noted that calculated median values in some instances did not fall within the calculated 20th and 80th percentile baseline criteria. In these instances, long term conditions were assessed, and potential issues individually addressed in the relevant reports. These variations were not considered to have constituted any significant environmental impact.

Some monitoring results which exceeded the performance criteria set out in the ASSMP were judged to have occurred due to natural seasonal variations, including rainfall events and other naturally occurring site conditions. Where results fell outside the 20th and 80th percentile baseline values, Tectonic reviewed these results together with other indicators of performance to assess if there had been any significant environmental impact or issue requiring further investigation or changes in management practices. In most

cases, the period of baseline monitoring was not sufficient to include the full range of natural variation and the exceedances could be attributed to natural processes. For some parameters, application of 20th and 80th percentile values was not an appropriate method of assessing results (e.g. chloride:sulfate ratio).

Over the course of monitoring undertaken, groundwater conditions have not been significantly impacted by the construction works. It is noted that, in instances where any single parameter was measured outside of the baseline values, other parameters which may have indicated construction impacts had not changed.

4.0 ASS VALIDATION TESTING

Soils identified as containing ASS that were disturbed during bulk earthworks for *MIBA* are understood to have been treated and managed in accordance with the approved ASSMP, including completion of verification testing, where required.

Management of these works was undertaken by Hall, with verification testing provided by their subcontractors, Qualtest Laboratory Pty Ltd (Qualtest). Disturbance of ASS was limited to excavation of material in vicinity of the Raff Creek bridge, as part of landscape trimming works. These materials were understood to have been treated at a nominal liming rate of 100 kg/m³, prior to verification testing. No further treatment of this material was undertaken by Hall on account of passed verification test results.

A summary of ASS verification testing completed between June 2023 and May 2024 is provided in Table 3.

Table 3: Summary of ASS Verification Test Results

Source Area	Approximate Bulk Earthworks Volume	Number of Samples/Tests	
		Passes	Fails
Raff Creek Bridge	4500 m ³	11	0

Note: Verification testing described in Table 3 includes trimming earthworks at Raff Creek Bridge which began in mid-May 2023. Up to 700 m³ (in addition to the reported 4500 m³) was completed within the 2022 to 2023 reporting period, before the verification testing was completed.

It is noted that the testing completed generally correspond to the earthworks volume estimates provided by Hall, at the prescribed rate of 1 test per 500 m³. Testing completed indicated that the soils had been sufficiently limed to counteract the relative ASS hazard present. The frequency and outcome of the testing undertaken is considered acceptable to confirm that these soils have been appropriately treated and managed from an ASS perspective.

It is also noted that a substantial proportion of earthworks was completed during the subject period in areas located above RL 5 m AHD or where ASS was known to be absent. Disturbances of ANS materials were also understood to have been treated with agricultural lime in accordance with the ASSMP but did not require validation testing under the approved ASSMP.

4.1 Lime Delivery Records

Lime delivery records provided by Hall indicate a total of 644 tonne of agricultural lime was delivered to the North Harbour MIBA site for use between June 2023 and September 2023. Assuming these materials were applied in accordance with the ASSMP, this volume sufficiently accounts for the treatment of all disturbed materials as described by Hall, at the soil treatment rates defined in the ASSMP, plus an additional 194 tonne which is expected to have been applied to ANS soils across the site.

5.0 CONCLUSION

The information provided by Hall has been reviewed and indicates that, where disturbed, ASS has been effectively treated and managed during ongoing land development at North Harbour.

Consistent completion of groundwater monitoring, ASS verification testing and reporting also indicates that soil and groundwater impacts relating to disturbance of ASS are being appropriately considered and managed. It is understood that there have been no major adverse environmental impacts to local soils or groundwater conditions as a result of the construction activities undertaken within the summary period.

These results demonstrate that risks associated with disturbance of ASS during development of *North Harbour Residential West* and *MIBA* are being appropriately managed by North Harbour and Hall during works to date.

6.0 LIMITATIONS

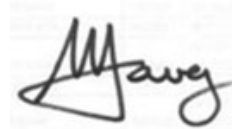
Your attention is drawn to the document *Limitations*, which is attached to this letter report. Please contact the undersigned should you wish to discuss any of the above matters.

Yours faithfully

TECTONIC GEOTECHNICAL PTY LTD



Mark Thomson BSc, CPESC 7057
Senior Environmental Scientist



Ashley Davey BEng RPEQ 8159
Principal Engineer

Attachments: Limitations

LIMITATIONS

This document has been prepared for the purpose outlined in Tectonic's proposal and no responsibility is accepted for the use of this document, in whole or in part, for any other purpose.

The scope of Tectonic's Services are as described in Tectonic's proposal, and are subject to restrictions and limitations. Tectonic did not perform a complete assessment of all possible conditions or circumstances that may exist at the site referenced in the report. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Tectonic in regards to it.

Conditions may exist which were undetectable given that economic and time constraints limit the practical extent of geotechnical investigation. Variations in conditions may occur between investigation locations, and there may be special conditions pertaining to the site which have not been revealed by the investigation and which have not therefore been taken into account in the document. Where variations exist on site, additional studies and actions may be required.

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Any assessments made in the preparation of this document are based on the conditions indicated from published sources and the findings of the investigation described. Actual subsurface conditions may differ from those indicated in the document (e.g. between boreholes or test pits). No warranty is included, either express or implied, that the actual conditions will conform exactly to the assessments contained in this document.

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Project Reference Number: LP140120

13 June 2024

Att: Michael McErlean
Planning & Approvals Manager
North Harbour Holding Pty Ltd
Brooke Crescent, Burpengary East QLD 4505

From: James Hall-Brown
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M: 0401 671 624 E: james@lithaqua.com

Monitoring Summary Report

North Harbour – Surface Water Quality Monitoring Summary – 2023 / 2024 Reporting Period North Harbour Residential Development, 44 Brooke Crescent, Burpengary East, QLD

Dear Michael,

North Harbour Holdings Pty Ltd (North Harbour) requested that Lithaqua Environmental Services Pty Ltd (Lithaqua) undertake the surface water quality monitoring program at the North Harbour development project located at 44 Brooke Crescent, Burpengary East, Queensland (the site).

The monitoring program was completed in general accordance with the Residential West Water Quality Monitoring Plan Version 7 (Cardno, 03/02/2015). Water quality monitoring has been conducted in general accordance with this document since July 2015. The water quality monitoring program conducted during the 2023 – 2024 reporting period aimed to gather water quality data to monitor the quality of surface water during the construction phase of the North Harbour residential development.

The objectives of this letter report are to succinctly present:

- Monitoring methodology used by Lithaqua to complete this monitoring program;
- Water quality monitoring data;
- Field parameters readings recorded and the analytical results of the water samples collected during this period; and
- Interpretation of the water quality data obtained.

Monthly in-situ and laboratory water quality sampling were conducted at 5 locations on-site (A, C, D, F and G) and 2 locations upstream and downstream of the development site on the Caboolture River (H and I). The locations of the sampling points are presented in Figures 1 and 2 and photographs of each sampling location is presented in Photographs 1-10 of the attached enclosures. The following headings provide a summary of the water quality monitoring program conducted over the reporting period with the aim of achieving the above stated objectives.

Monitoring Methodology

The water quality monitoring was conducted by Lithaqua personnel in general accordance with the NEBP Residential West Water Quality Monitoring Plan (Version 7), the Australian Standard AS5667.1-1998 (Water Quality – Sampling Part 1: Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples), the Australian Standard AS5667.6-1998 (Water Quality – Sampling Part 6: Guidance on the Sampling of Rivers and Streams), and Queensland regulatory requirements.

The following method was utilised by Lithaqua personnel to monitor water quality at each monitoring location:

- Upon arrival at the monitoring location, a visual assessment for potential presence of litter and surface sheen was conducted;
- Field parameters including turbidity, temperature, Dissolved Oxygen (DO), Electrical Conductivity (EC) and pH were measured using adequately calibrated water quality monitoring equipment;
- The analysis of the physico-chemical properties of water from each location was conducted by collecting the samples using a telescopic sampling pole. Appropriately labelled, laboratory supplied sample containers were immersed upside down beneath the water surface then turned right way up to collect the sample. Sample containers were sealed, placed on ice and transferred to a National Association of Testing Authorities (NATA) accredited laboratory - Australian Laboratory Services (ALS) in Stafford, Queensland using appropriate sample preservation procedures and Chain-of-Custody (CoC) documentation for the analysis of physico-chemical water quality parameters including turbidity, DO, EC and pH.
- An additional water sample for biological analysis was collected at each location using the same methodology for analysis of Chlorophyll-‘a’ concentrations.

Results

The field measurements and observations obtained from all monitoring locations (A, C, D, F, G, H and I) over the reporting period are summarised in Tables 1-7. Analytical data provided by ALS from samples collected from all monitoring locations over the reporting period are presented in Tables 1-7. Laboratory reports including the Certificate of Analysis (COA), COC and Sample Receipt Notification (SRN) reports are presented in the attachments.

Due to insufficient water depth to immerse the sensors of the water quality monitoring instruments and a lack of water for sample collection/analysis, the availability of data has been limited at locations A and F. Over the reporting period, Location A (upstream Raff Creek), has been observed to be dry on 2 occasions (October and November 2023). Location F (upstream Raff Creek tributary) has been observed to be dry on 3 occasions (August, October and November 2023). The lack of surface water at Locations A and F is consistent with seasonal variations in rainfall and subsequent overland flow that has been observed and recorded during previous reporting periods and the baseline data observations that were recorded prior to commencement of construction.

Data Interpretation

Field and laboratory measured parameters including Turbidity, DO, pH and Chlorophyll-a were compared against the Recommended Water Quality Objectives (WQOs) from the Department of Environment and Heritage Protection (EHP) 'Queensland Water Quality Guidelines 2009' dated July 2013 and the Department of Environment and Resource Management (DERM) 'Environmental Protection (Water) Policy 2009

Caboolture River environmental values and water quality objectives Basin No. 142 (part), including all tributaries of Caboolture River' dated July 2010.

As temperature and conductivity results are consistent with historical monitoring results, further interpretation of these parameters is not considered necessary.

With reference to Tables 1 - 7 and the recommended water quality objective values listed, the following conclusions are drawn with respect to the key water quality parameters (Dissolved Oxygen, Chlorophyll-a, Turbidity and pH).

Dissolved Oxygen

The DO measurements during the monthly in-situ sampling events were consistently below the recommended WQOs at all locations except location I. The points below summarise the results for DO over the reporting period at each location.

- All DO measurements at location A were below the lowland freshwater WQO (85-110% saturation) over the reporting period.
- DO measurements at location C were below the Middle Estuary WQO (85-105%) for all sampling events except for 2 events in May and June 2024.
- DO measurements at location D were below the middle estuary WQO for all sampling events except for 2 events in July and September 2023.
- DO measurements at location F were below the lowland freshwater WQO for all sampling events.
- DO measurements at location G were below the middle estuary WQO for all sampling events except for 1 event in July 2023.
- DO measurements at location H were below the middle estuary WQO for all sampling events; and
- DO measurements at location I were within the middle estuary WQO for all sampling events except for 3 events in September and December 2023 and May 2024.

These measurements are consistent with the values recorded in previous reporting periods including pre-construction baseline monitoring.

Chlorophyll-a

During the monthly in-situ sampling events, a sample of water was collected from each location then sent to ALS for analysis of chlorophyll-a concentrations. Concentrations of Chlorophyll-a were reported to be above the recommended water quality objective values at monitoring locations within the overall development site (A, C, D and F) for approximately half of the sampling events. The concentrations of Chlorophyll-a in water samples collected from freshwater locations upstream of the development (A and F) were in most cases, higher than the concentrations detected from the tidally influenced downstream locations (C and D).

This suggests that the development activities within the watershed above locations C and D are not contributing to significant nutrient entrainment and upstream activities (external to the site) may be the primary source of nutrient loads responsible for the exceedances detected. This provides evidence that the erosion and sediment control measures and artificial wetlands that have been established at the site are effective in reducing nutrient entrainment into the surface waterways intersecting the site. By limiting the amount of

nutrients entering Raff Creek and its tributary, algal blooms and the subsequent deterioration of physico-chemical water quality parameters has been controlled to preserve the condition of the local aquatic ecosystem.

Monitoring locations H and G on the Caboolture River were reported to be above the recommended WQOs for Chlorophyll-a in 5 out of the 11 sampling events and 3 out of the 11 rounds conducted at Location I. The concentrations of Chlorophyll-a from this reporting period are consistent with the values recorded in previous reporting periods.

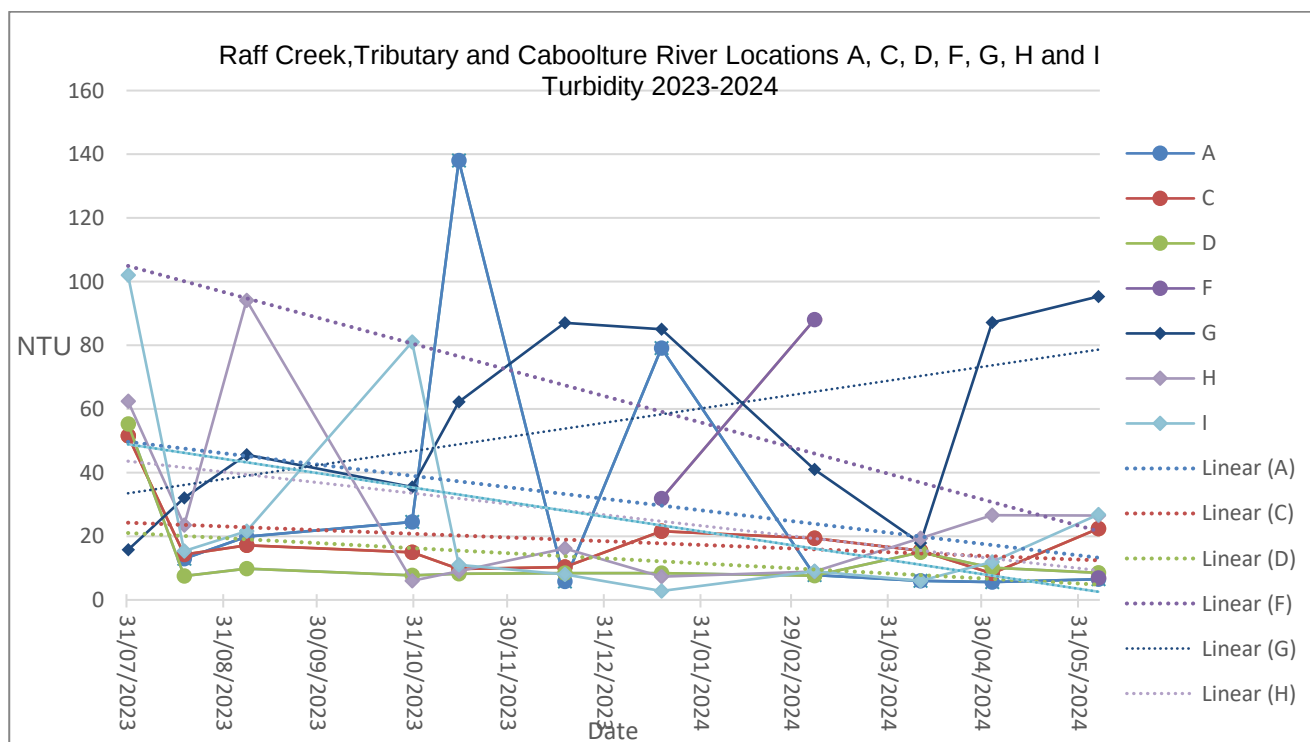
Turbidity

Turbidity readings taken during the 2023-2024 reporting period from the tidally influenced monitoring locations C, G and H exceeded the recommended middle estuary WQO (<8NTU) in approximately half of the sampling events. At the furthestmost downstream location (I), turbidity results were above the recommended WQO in 4 instances. Location D had only 1 exceedance of the turbidity WQO during the reporting period.

The turbidity values recorded at freshwater location A (upstream of location C) during this reporting period were all below the lowland freshwater WQO (<50NTU). Turbidity readings from location F (upstream of location D) were all below the WQO except for one instance in July 2023 and were comparable to the concentrations detected from the tidally influenced downstream locations (C and D).

The results from the current reporting period at locations A, C, D, F, G, H and I are comparable to the baseline results collected in 2014-2016 from these locations. Graph 1 below presents the turbidity readings for all monitoring locations over the current reporting period.

Graph 1. Turbidity Readings – Locations A, C, D, F, G, H and I



pH

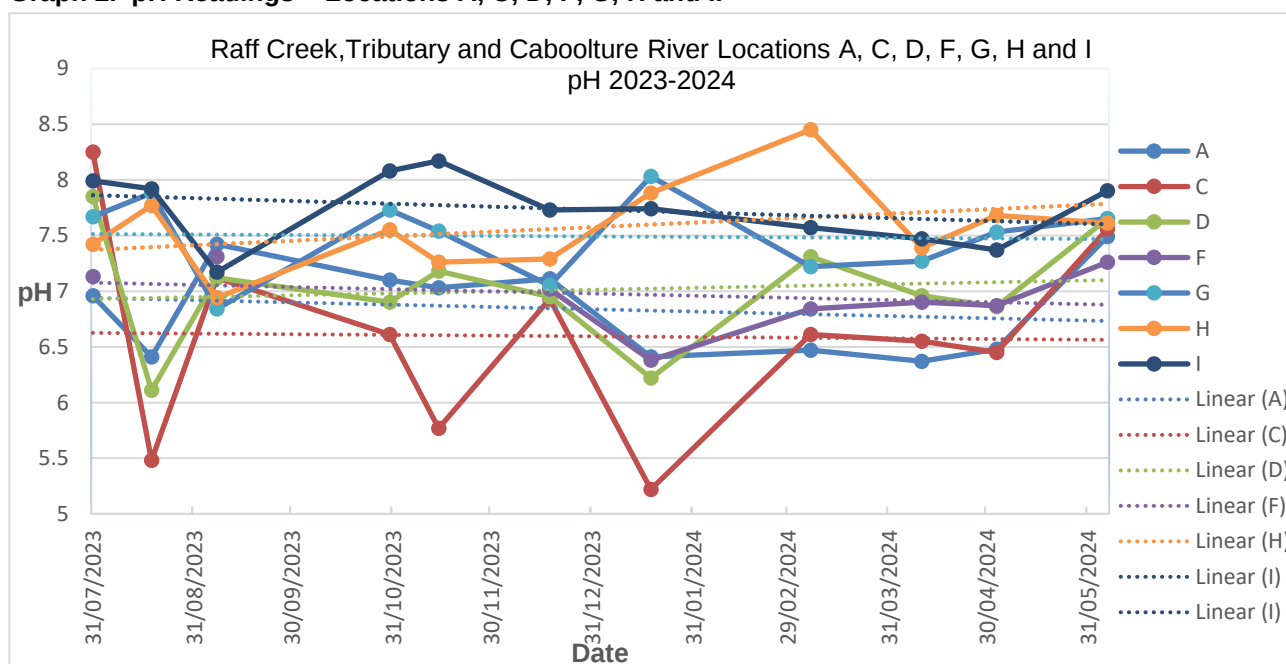
The results from sampling events conducted at upstream freshwater locations (A and F) were within the acceptable range for pH (pH 6.5 – 8.0) in all instances except for January 2024 (pH 5.83 and pH 6.38 respectively). This is consistent with previous sampling rounds conducted at these locations during and pre-construction monitoring.

The pH values from monitoring location G on the Caboolture River were all recorded to be within the acceptable WQO range (pH 7.0 – 8.4) except for 1 event in September 2023 which was marginally below the WQO (pH 6.84). The pH values from monitoring location H were all recorded to be within the acceptable WQO range except for 2 events. In September 2023 it was recorded to be marginally below the WQO (pH 6.94) and in March 2024 when it was marginally above the WQO (pH 8.45). The pH values from monitoring location I were all recorded to be within the acceptable WQO range. These results are consistent with data collected during the pre-construction monitoring and the previous reporting periods.

pH values recorded at the tidally influenced monitoring location on Raff Creek (location C) were recorded to be within the recommended WQOs for all but 3 sampling events in September 2023 (pH 6.56), December 2023 (pH 6.88) and January 2024 (pH 6.09). pH values recorded at the tidally influenced monitoring location on the Raff Creek tributary (location D) were recorded to be within the recommended WQOs for all but 2 sampling events in September 2023 (pH 6.59) and January 2024 (pH 6.36).

The number of exceedances of the pH WQO at location C during this reporting period appear to be less frequent and to a lesser magnitude when compared to previous reporting periods and the baseline data collected pre-construction. For the upstream freshwater locations (A and F) and the Caboolture River upstream, midstream and downstream tidal locations (H, G and I), the pH data collected over the reporting period is consistent with the values obtained for these locations during the pre-construction monitoring and the previous reporting periods and are not indicative of unacceptable disturbance of Acid Sulphate Soils (ASS) or Potential Acid Sulphate Soils (PASS) resulting from construction activities. Graph 2 below presents pH readings for each monitoring location over the reporting period.

Graph 2. pH Readings – Locations A, C, D, F, G, H and I.

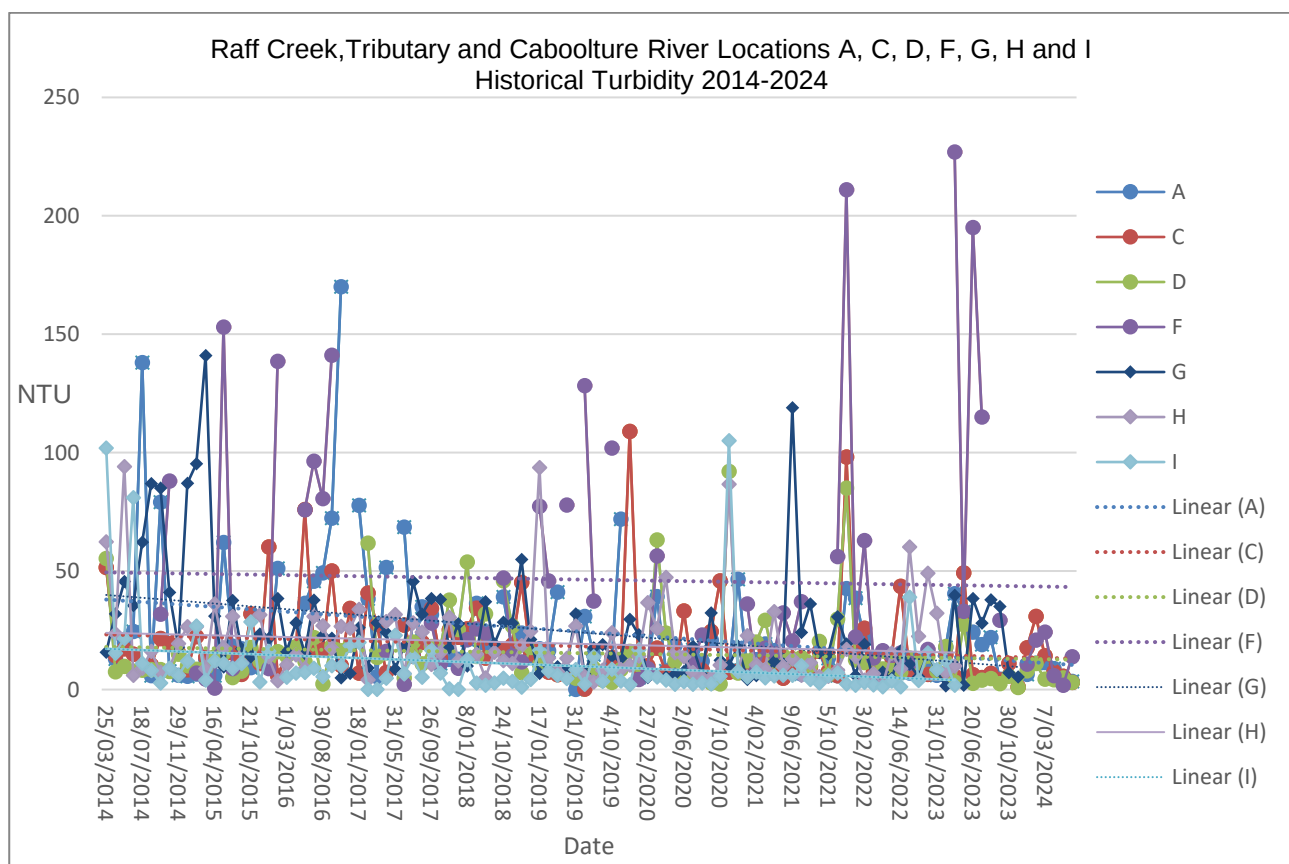


Historical Data Trends

The field and analytical data presented in Tables 1 to 7 indicates that the results from samples collected during the 2023 -2024 reporting period were consistent with the data obtained during previous reporting periods since 2014. The number of exceedances of key WQOs identified at the tidally influenced midstream locations were noted to be less frequent over the current reporting period compared to previous reporting periods before and during construction and were generally consistent with the data obtained upstream of the construction works. The field measurements and analytical results (with water quality objective values highlighted) are presented in Tables 1-7.

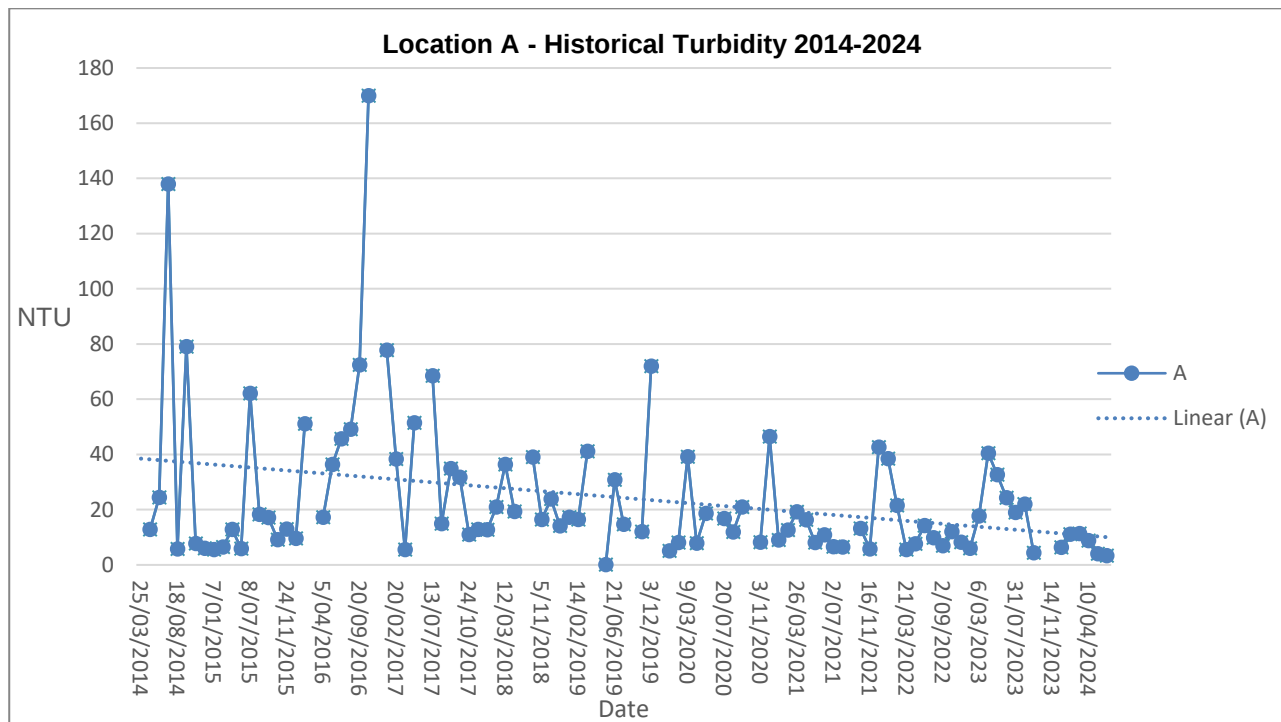
Historical turbidity measurements from all sampling locations (A, C, D, F, G, H and I) have been plotted to show the trend of turbidity over the total period of the development below in Graph 3.

Graph 3. Historical Turbidity Readings and Linear Trend – Locations A, C D, F, G, H and I

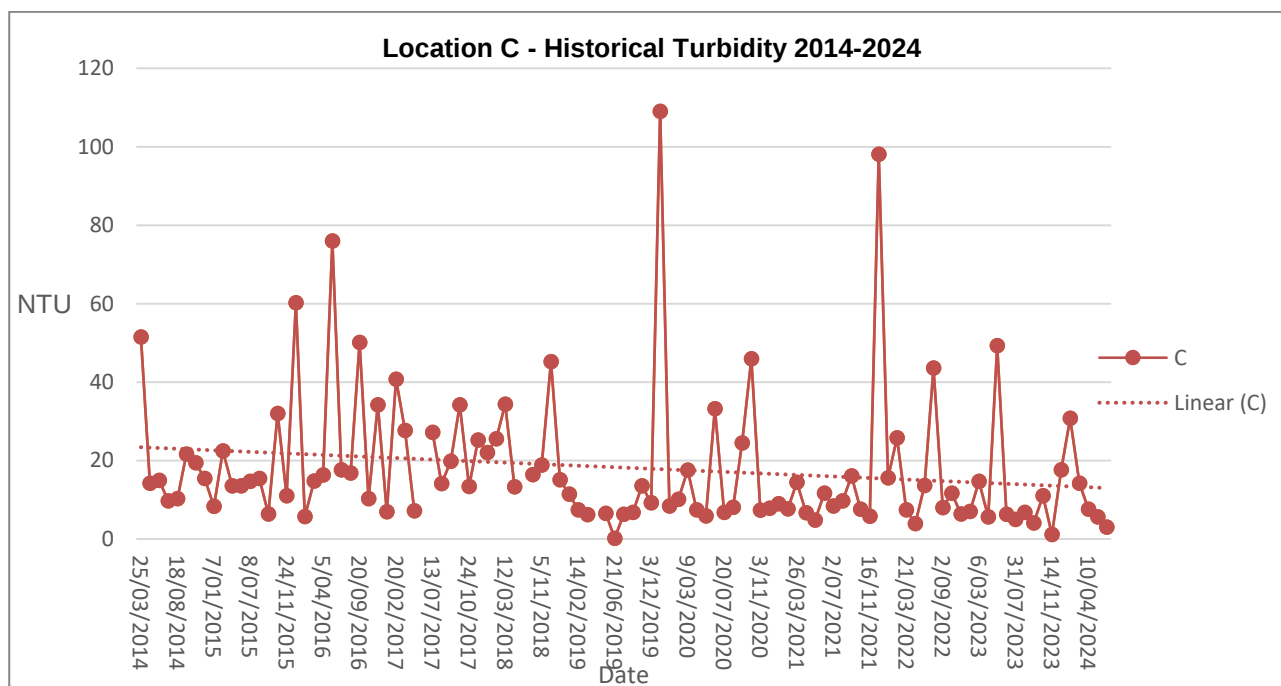


Historical turbidity measurements from each sampling location (A, C, D, F, G, H and I) have been plotted to show the trend of turbidity over the monitoring period of the development (2014-2024) in Graphs 4, 5, 6, 7, 8, 9 and 10 below.

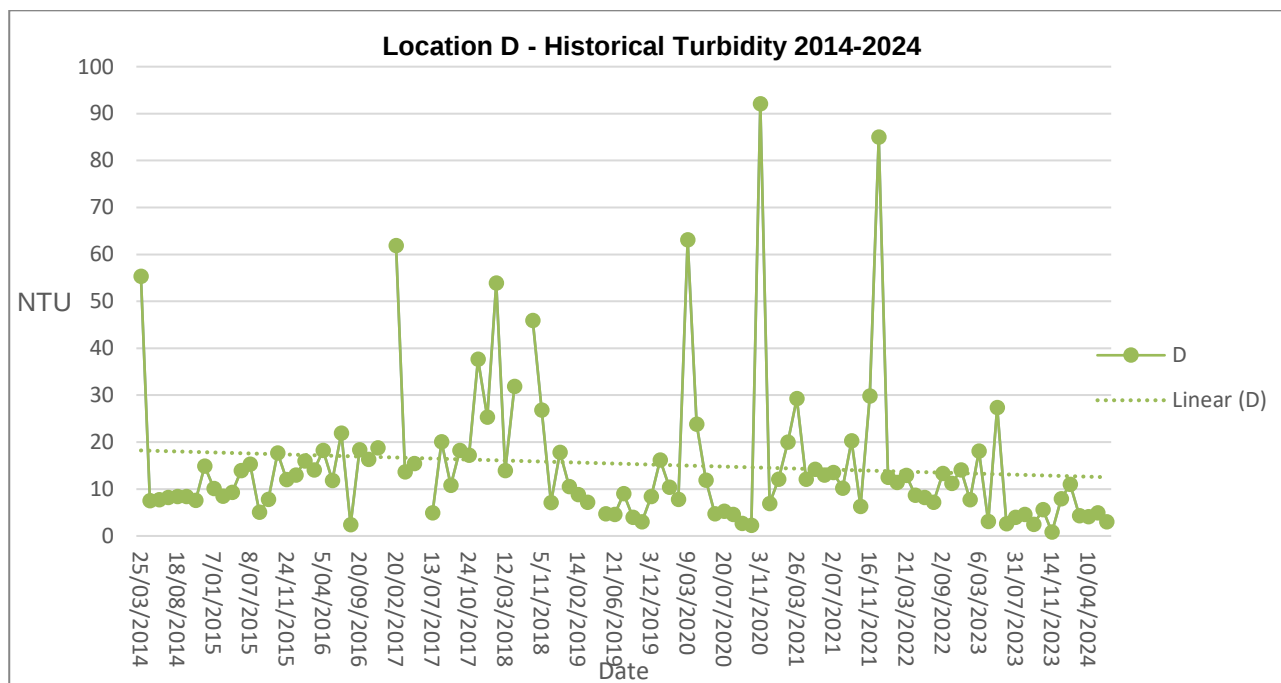
Graph 4. Historical Turbidity Readings and Linear Trend – Location A.



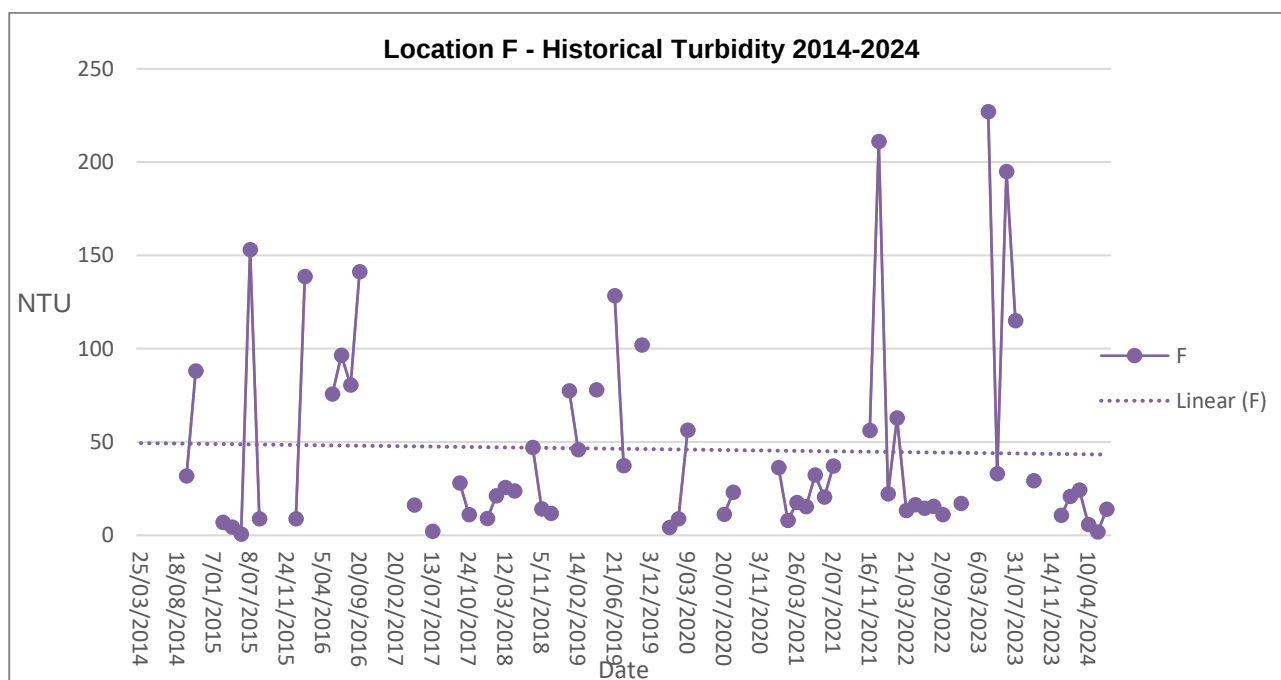
Graph 5. Historical Turbidity Readings and Linear Trend – Location C.



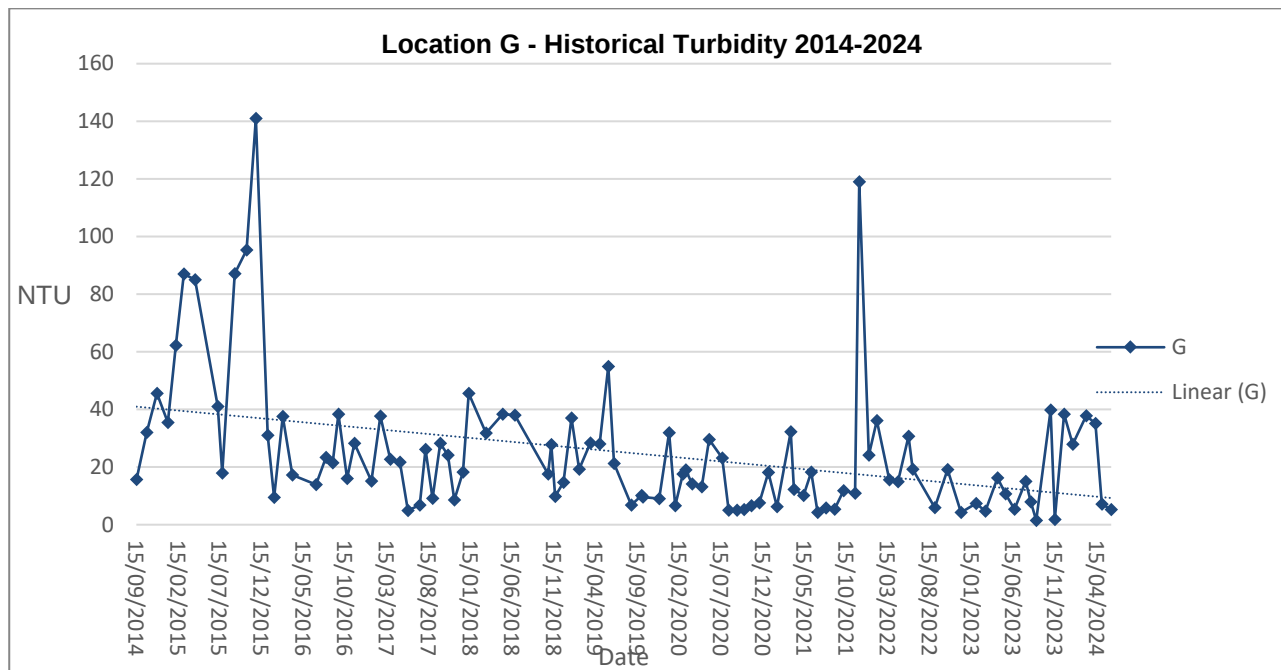
Graph 6. Historical Turbidity Readings and Linear Trend – Location D.



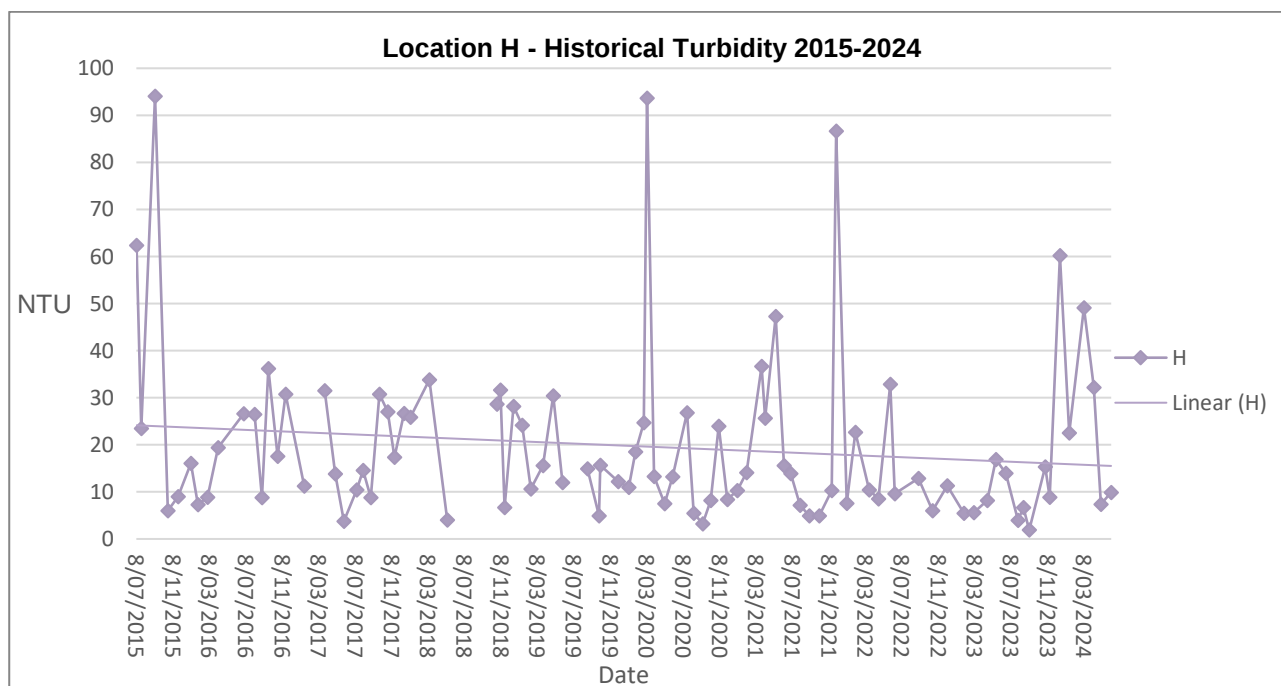
Graph 7. Historical Turbidity Readings and Linear Trend – Location F.



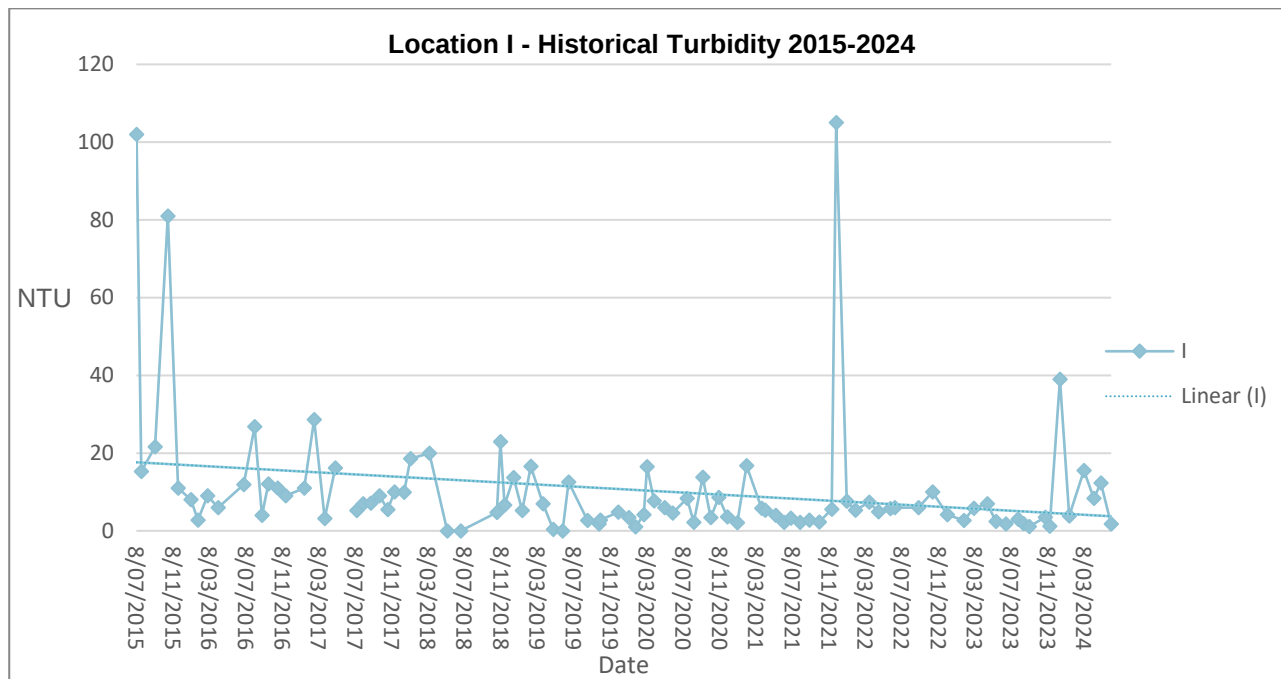
Graph 8. Historical Turbidity Readings and Linear Trend – Location G.



Graph 9. Historical Turbidity Readings and Linear Trend – Location H.



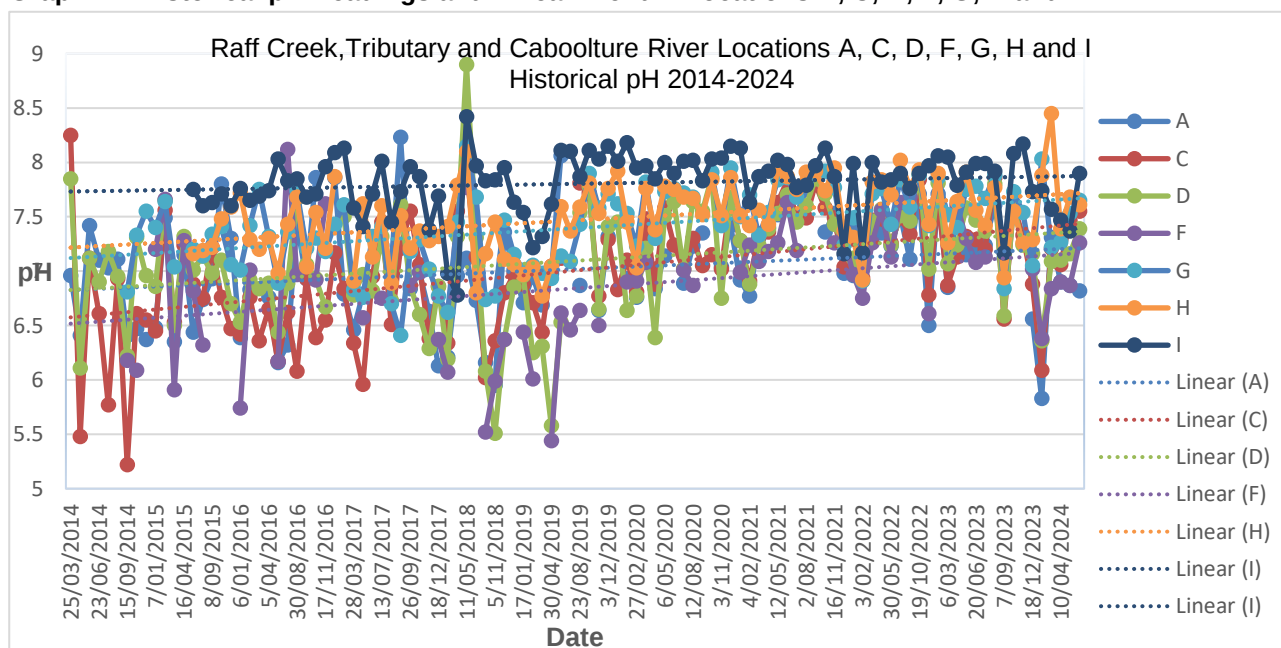
Graph 10. Historical Turbidity Readings and Linear Trend – Location I.



Graphs 3-10 demonstrate that turbidity readings taken prior to and during construction from all sampling locations (A, C, D, F, G, H and I) have decreased. The negative linear trend at Locations C and D demonstrate that the sediment and erosion control measures used during construction have been successful in improving or maintaining water clarity within Raff Creek and its tributary.

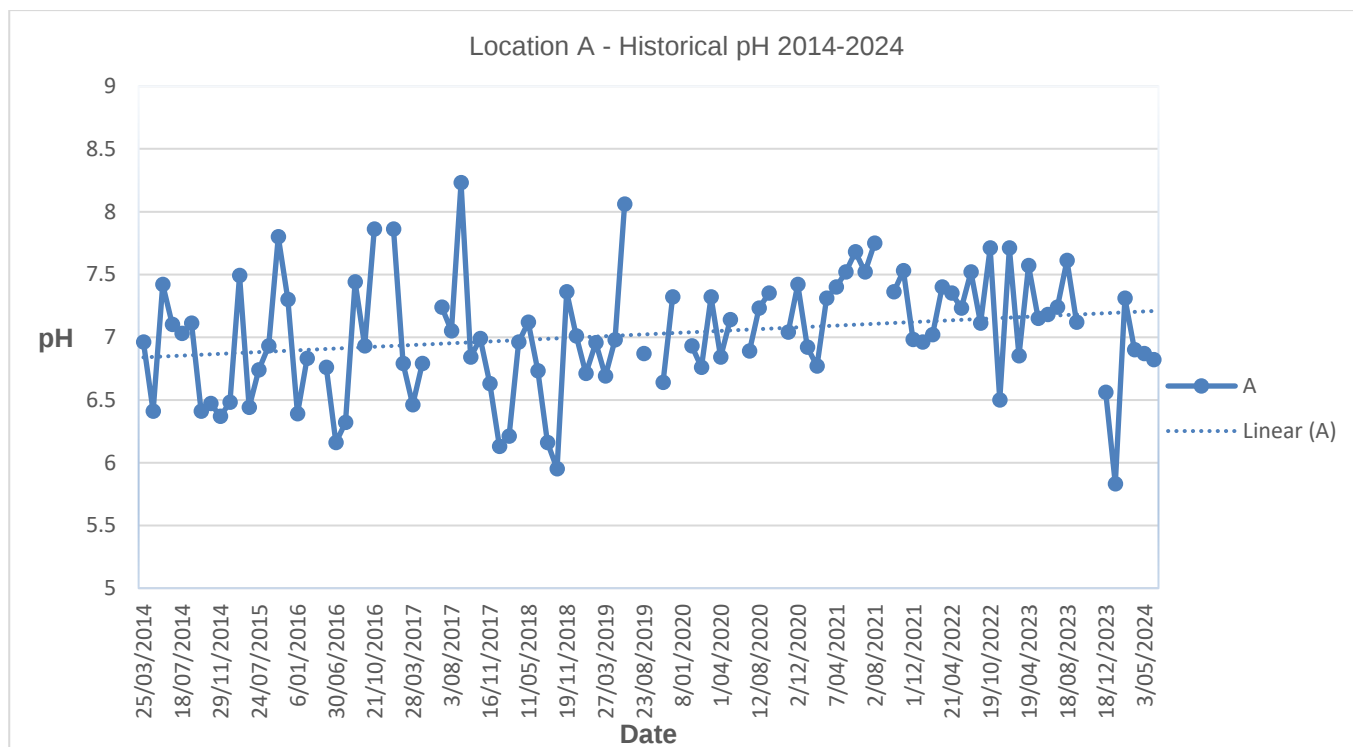
Historical pH measurements from all sampling locations (A, C, D, F, G, H and I) have been plotted to show the trend of pH over the total period of the development below in Graph 11.

Graph 11. Historical pH Readings and Linear Trend – Locations A, C, D, F, G, H and I.

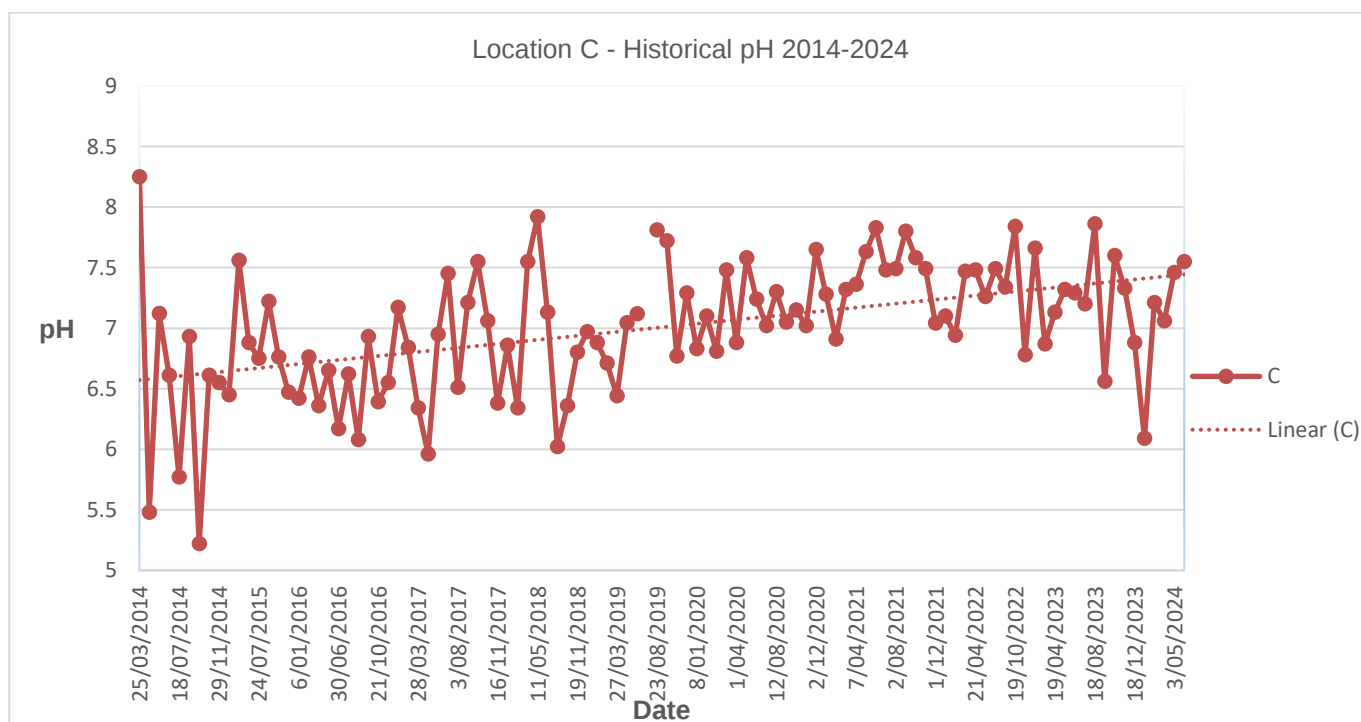


Historical pH measurements from each sampling location (A, C, D, F, G, H and I) have been plotted to show the trend of pH over the total period of the development below in Graphs 12, 13, 14, 15, 16, 17, and 18 below.

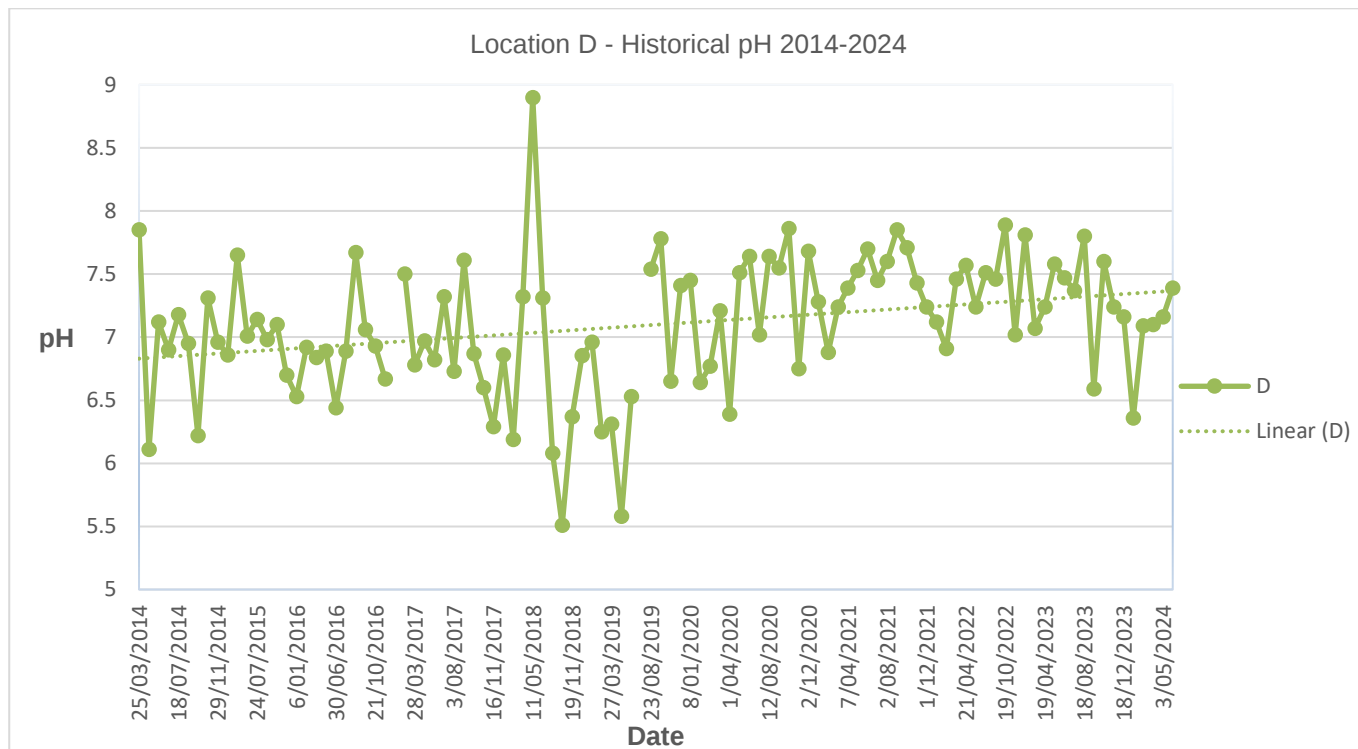
Graph 12. Historical pH Readings and Linear Trend – Location A.



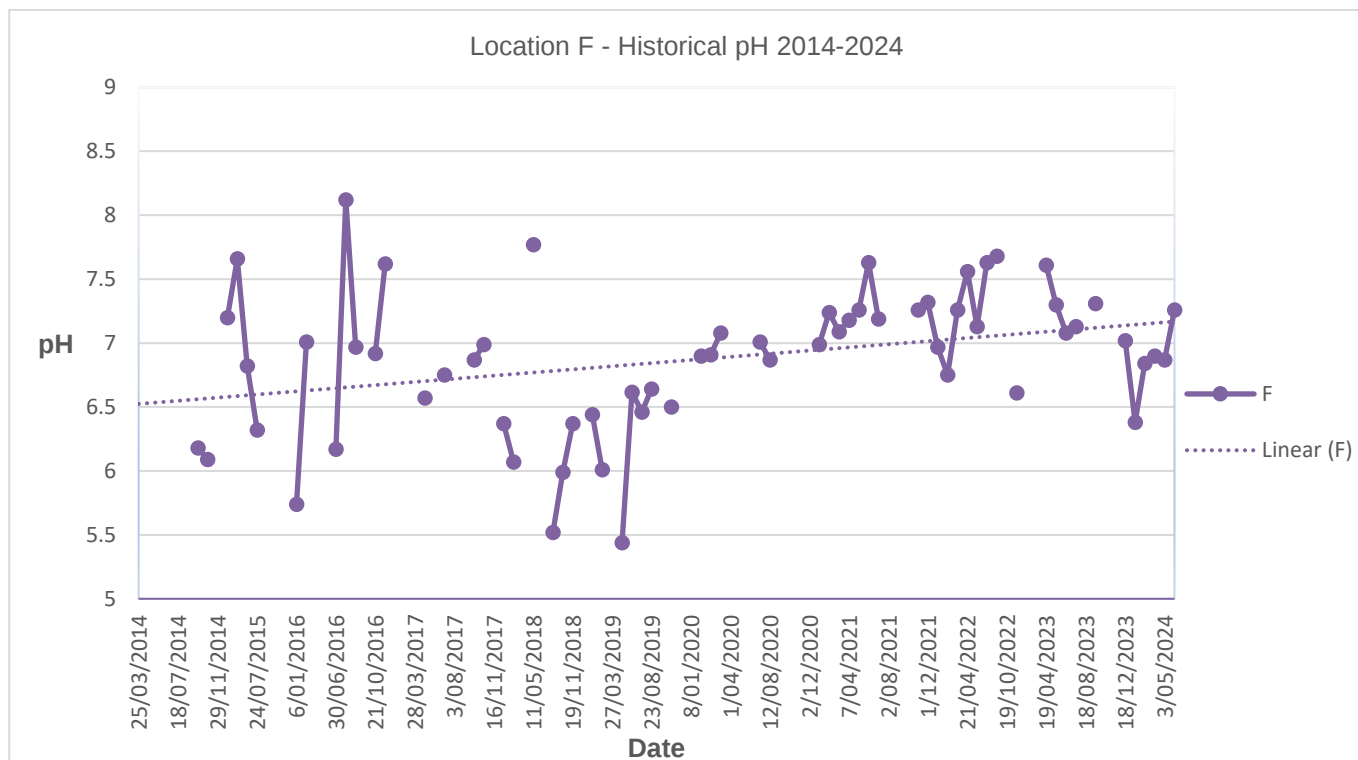
Graph 13. Historical pH Readings and Linear Trend – Location C.



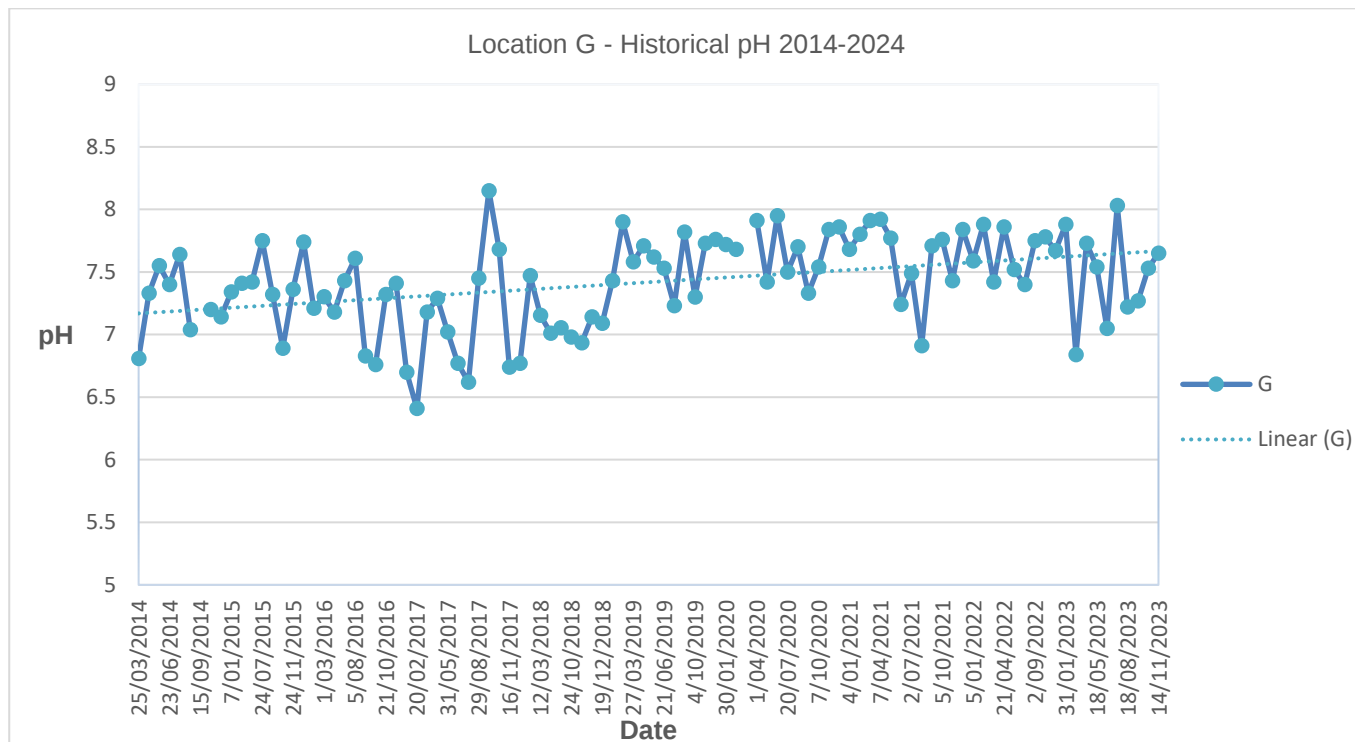
Graph 14. Historical pH Readings and Linear Trend – Location D.



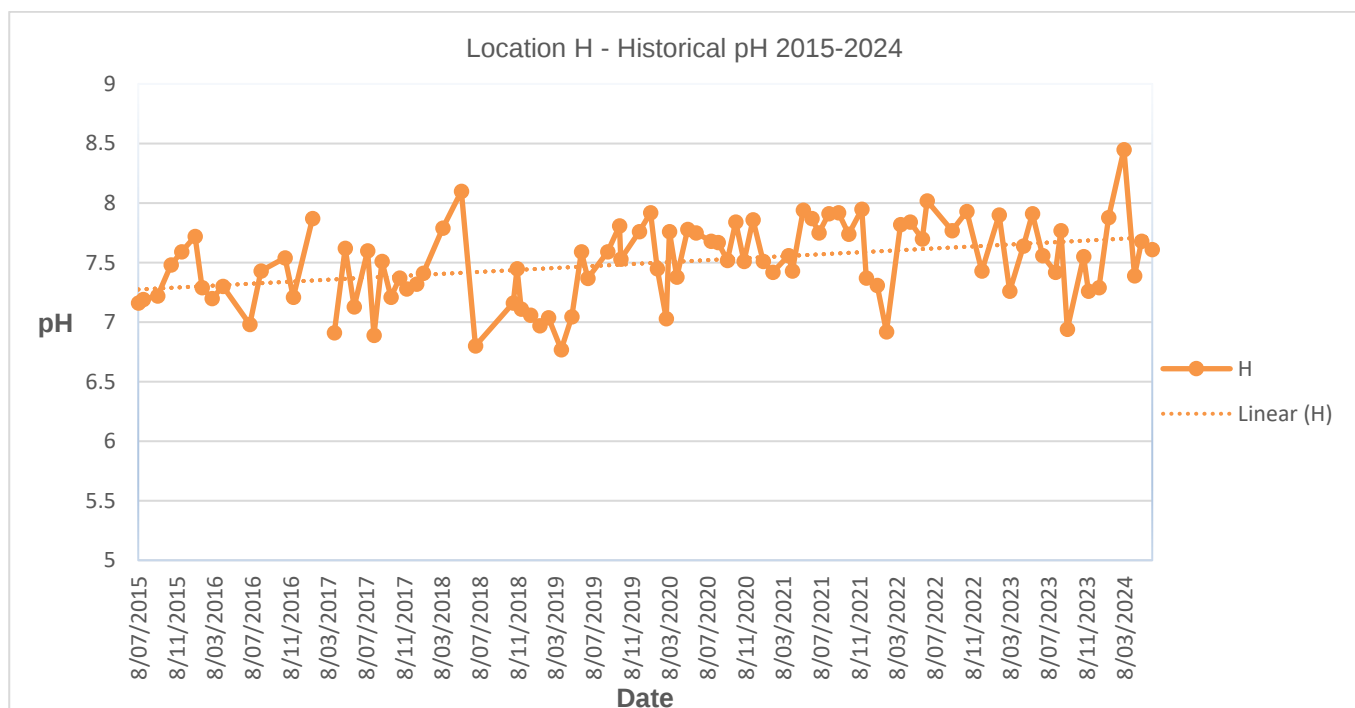
Graph 15. Historical pH Readings and Linear Trend – Location F.



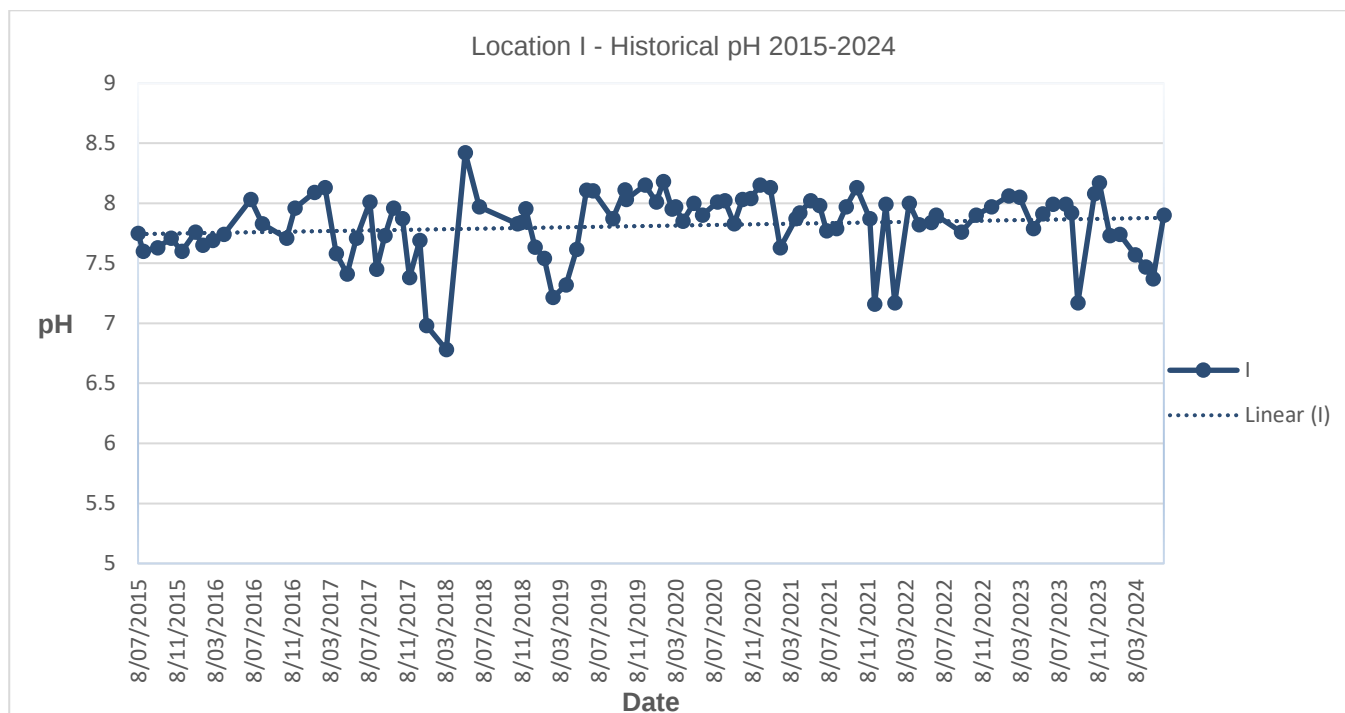
Graph 16. Historical pH Readings and Linear Trend – Location G.



Graph 17. Historical pH Readings and Linear Trend – Location H.



Graph 18. Historical pH Readings and Linear Trend – Location I.



Graphs 11 - 18 demonstrate the overall trend of increasing pH values at sampling locations A, C, D, F, G, H and I. The trend of increasing pH values in locations C and D provides evidence that if any disturbance of ASS or PASS soils has occurred during the development of the project, it has not impacted the pH of Raff Creek or its tributary. The trend of increasing pH from water samples collected from sampling locations C and D also suggests the management of ASS/PASS at the development site has been successful in mitigating any acidification of Raff Creek and its tributary over the duration of the project development.

Conclusions

Based on the results of this monitoring, it appears that any impact to the quality of the surface water of the site, from past and current construction works has been mitigated and there is little evidence of any significant impact to the water quality since the commencement of construction activities on the site.

The number of exceedances of the pH WQO at locations C and D during this reporting period appear to be less frequent and to a lesser magnitude when compared to previous reporting periods and the baseline data collected pre- construction, suggesting an improvement of this key water quality indicator. The sediment and erosion control measures and the amelioration of any ASS/PASS disturbance employed by the bulk earthworks contractor are deemed satisfactory to minimise impact on surface water quality

Turbidity readings taken prior to and during construction from sampling locations within the site (A, C, D and F) have shown a decreasing trend. This suggests that the sediment and erosion control measures used during construction have been successful in reducing sediment entrainment into the local waterways which has improved or at minimum, maintained water clarity within Raff Creek and its tributary. pH measurements show an overall trend of increasing pH values at sampling locations A, C, D, F, G, H and I. The trend of increasing pH values in locations C and D provides evidence that if any disturbance of ASS or PASS soils has occurred during the development of the project, it has not impacted the pH of Raff Creek or its tributary.

If you have any questions regarding this letter report, please contact the undersigned on 0401 671 624 or james@lithaqua.com

Yours sincerely,



James Hall-Brown

BSc (Environment)

Senior Environmental Scientist

Enclosures:

Tables

Table 1 – Location A – Water Quality Monitoring Data Summary
Table 2 – Location C – Water Quality Monitoring Data Summary
Table 3 – Location D – Water Quality Monitoring Data Summary
Table 4 – Location F – Water Quality Monitoring Data Summary
Table 5 – Location G – Water Quality Monitoring Data Summary
Table 6 – Location H – Water Quality Monitoring Data Summary
Table 7 – Location I – Water Quality Monitoring Data Summary

Figures

Figure 1 – On-Site Monitoring Locations
Figure 2 – External Water Quality Monitoring Locations

Photographs

Photograph 1 – Monitoring Location A
Photograph 2 – Monitoring Location C
Photograph 3 – Monitoring Location C
Photograph 4 – Monitoring Location D
Photograph 5 – Monitoring Location F
Photograph 6 – Monitoring Location G
Photograph 7 – Monitoring Location H
Photograph 8 – Monitoring Location I

Laboratory Reports

EB2323200
EB2325452
EB2327668
EB2333644
EB2335679
EB2340040
EB2401623
EB2407780
EB2411900
EB2414852
EB2419283



Tables

Table 1
Water Quality Monitoring Data Summary
Location A - Upstream Raff Creek
North Harbour - Water Quality Monitoring - 2023/2024 Reporting Period
North Harbour, 44 Brooke Crescent, Burpengary East QLD

*WATER QUALITY PARAMETERS			Turbidity (NTU)	Temperature (C°)	Dissolved Oxygen (% Saturation)	Conductivity (µS/cm)	pH (-log[H+])	^Litter (>5mm)	Chlorophyll-a (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES	Lowland Freshwater		<50 NTU	-	85-110%	-	6.5-8.0	-	5
	Middle Estuary		<8NTU	-	85-105%	-	7.0 - 8.4	-	4
Location	Sample ID	Date							
Upstream Raff Creek	A	31/07/2023	19.0	17.3	58	219	7.24	Plastic bottle	12
	A	18/08/2023	22	18.5	17.0	229	7.61	Plastic barrier fencing	7
	A	7/09/2023	4.4	23.0	34.7	258.8	7.12	Plastic barrier fencing	8
	A	30/10/2023	Dry - sample not collected						
	A	14/11/2023	Dry - sample not collected						
	A	18/12/2023	6.4	23.1	30.8	195	6.56	No	12
	A	18/01/2024	11.1	26.5	35	180.3	5.83	Foam box	<1
	A	7/03/2024	11.4	24.6	17	191.4	7.31	No	3
	A	10/04/2024	8.8	20.9	27.2	188	6.90	No	<2
	A	3/05/2024	4.0	19.6	43.8	239	6.87	No	2
	A	6/06/2024	3.4	19.1	52.3	226	6.82	No	4

Notes:

- "*" Recommended Water Quality Objectives from the Department of Environment and Heritage Protection (EHP) 'Queensland Water Quality Guidelines 2009' dated July 2013 and the Department of Environment and Resource Management (DERM) 'Environmental Protection (Water) Policy 2009 Caboolture River environmental values and water quality objectives Basin No. 142 (part), including all tributaries of Caboolture River' dated July 2010;
- "°" Water Quality Parameters as recommended in the Northeast Business Park -Residential West Water Quality Plan (V7) prepared by Cardino, 3 February 2015);
- "-" Indicates the value is not applicable;
- "... " Indicates the reading was not taken due to equipment failure or error;
- Highlighted values indicate a result in excess of the recommended Water Quality Objectives; and
- "^" Litter results are based on a visual assessment of the sampling location on the day of sampling.

Table 2
Water Quality Monitoring Data Summary
Location C - Midstream Raff Creek
North Harbour - Water Quality Monitoring - 2023/2024 Reporting Period
North Harbour, 44 Brooke Crescent, Burpengary East QLD

*WATER QUALITY PARAMETERS			Turbidity (NTU)	Temperature (C°)	Dissolved Oxygen (% Saturation)	Conductivity (µS/cm)	pH (-log[H+])	^Litter (>5mm)	Chlorophyll-a (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES	Lowland Freshwater		<50 NTU	-	85-110%	-	6.5-8.0	-	5
	Middle Estuary		<8NTU	-	85-105%	-	7.0 - 8.4	-	4
Location	Sample ID	Date							
Midstream Raff Creek	C	31/07/2023	5.0	19.1	74.9	14900	7.20	Plastic Wrapper	2
	C	18/08/2023	6.8	19.8	62.2	38200	7.86	No	4
	C	7/09/2023	4.1	22.0	81.2	11325	6.56	Plastic bottles	3
	C	30/10/2023	11.0	25.4	65.4	37600	7.60	No	2
	C	14/11/2023	1.1	27.0	70.4	43719	7.33	Glass bottle	32
	C	18/12/2023	17.6	27.9	56.4	851	6.88	Tin can	11
	C	18/01/2024	30.8	28.8	45	366.3	6.09	Plastic bottle	1
	C	7/03/2024	14.2	24.7	35	230.1	7.21	No	6
	C	10/04/2024	7.6	22.8	48	289	7.06	Tin can	<2
	C	3/05/2024	5.6	20.4	85.1	1800	7.46	No	2
	C	6/06/2024	3.0	20.1	92.2	8370	7.55	No	2

Notes:

- "*" Recommended Water Quality Objectives from the Department of Environment and Heritage Protection (EHP) 'Queensland Water Quality Guidelines 2009' dated July 2013 and the Department of Environment and Resource Management (DERM) 'Environmental Protection (Water) Policy 2009 Caboolture River environmental values and water quality objectives Basin No. 142 (part), including all tributaries of Caboolture River' dated July 2010;
- "o" Water Quality Parameters as recommended in the Northeast Business Park -Residential West Water Quality Plan (V7) prepared by Cardino, 3 February 2015);
- "-" Indicates the value is not applicable;
- "--" Indicates the reading was not taken due to equipment failure or error;
- Highlighted values indicate a result in excess of the recommended Water Quality Objectives; and
- "^" Litter results are based on a visual assessment of the sampling location on the day of sampling.

Table 3
Water Quality Monitoring Data Summary
Location D - Midstream Raff Creek Tributary
North Harbour - Water Quality Monitoring - 2023/2024 Reporting Period
North Harbour, 44 Brooke Crescent, Burpengary East QLD

*WATER QUALITY PARAMETERS			Turbidity (NTU)	Temperature (C°)	Dissolved Oxygen (% Saturation)	Conductivity (µS/cm)	pH (-log[H+])	^Litter (>5mm)	Chlorophyll-a (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES	Lowland Freshwater		<50 NTU	-	85-110%	-	6.5-8.0	-	5
	Middle Estuary		<8NTU	-	85-105%	-	7.0 - 8.4	-	4
Location	Sample ID	Date							
Midstream Raff Creek Tributary	D	31/07/2023	4.0	18.7	85.1	25400	7.37	No	6
	D	18/08/2023	4.6	19.9	73.9	30200	7.80	No	41
	D	7/09/2023	2.5	24.9	99.3	32528	6.59	Plastic bottle	10
	D	30/10/2023	5.6	25.3	63.4	40400	7.60	Plastic bottle	3
	D	14/11/2023	0.8	26.8	65.5	45365	7.24	No	10
	D	18/12/2023	7.9	26.3	50.3	335	7.16	No	8
	D	18/01/2024	11.0	29.4	38	254.5	6.36	Aluminium Can	<2
	D	7/03/2024	4.3	25.6	45	257.4	7.09	No	3
	D	10/04/2024	4.1	21.1	45.7	280	7.10	No	2
	D	3/05/2024	4.9	20.7	63.6	429	7.16	No	<1
	D	6/06/2024	3.0	20.2	74.1	1390	7.39	No	1

Notes:

- "*" Recommended Water Quality Objectives from the Department of Environment and Heritage Protection (EHP) 'Queensland Water Quality Guidelines 2009' dated July 2013 and the Department of Environment and Resource Management (DERM) 'Environmental Protection (Water) Policy 2009 Caboolture River environmental values and water quality objectives Basin No. 142 (part), including all tributaries of Caboolture River' dated July 2010;
- "o" Water Quality Parameters as recommended in the Northeast Business Park -Residential West Water Quality Plan (V7) prepared by Cardino, 3 February 2015);
- "-" Indicates the value is not applicable;
- "-" Indicates the reading was not taken due to equipment failure or error;
- Highlighted values indicate a result in excess of the recommended Water Quality Objectives; and
- "^" Litter results are based on a visual assessment of the sampling location on the day of sampling.

Table 4
Water Quality Monitoring Data Summary
Location F - Upstream Raff Creek Tributary
North Harbour - Water Quality Monitoring - 2023/2024 Reporting Period
North Harbour, 44 Brooke Crescent, Burpengary East QLD

*WATER QUALITY PARAMETERS			Turbidity (NTU)	Temperature (C°)	Dissolved Oxygen (% Saturation)	Conductivity (µS/cm)	pH (-log[H+])	^Litter (>5mm)	Chlorophyll-a (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES	Lowland Freshwater		<50 NTU	-	85-110%	-	6.5-8.0	-	5
	Middle Estuary		<8NTU	-	85-105%	-	7.0 - 8.4	-	4
Location	Sample ID	Date							
Upstream Raff Creek Tributary	F	31/07/2023	115.0	19.3	83.7	284	7.13	No	7
	F	18/08/2023	Dry - sample not collected						
	F	7/09/2023	29.2	20.1	77.7	880	7.31	No	17
	F	30/10/2024	Dry - sample not collected						
	F	14/11/2024	Dry - sample not collected						
	F	18/12/2023	10.7	28.2	42.4	237.0	7.0	No	6
	F	18/01/2024	20.9	27.7	27	207	6.38	No	<2
	F	7/03/2024	24.3	24.2	20	237.5	6.84	No	5
	F	10/04/2024	5.8	20.1	22.5	265	6.90	No	2
	F	3/05/2024	1.8	19.3	39.8	325	6.87	No	2
	F	6/06/2024	13.9	19.1	47	310	7.26	No	40

Notes:

- "*" Recommended Water Quality Objectives from the Department of Environment and Heritage Protection (EHP) 'Queensland Water Quality Guidelines 2009' dated July 2013 and the Department of Environment and Resource Management (DERM) 'Environmental Protection (Water) Policy 2009 Caboolture River environmental values and water quality objectives Basin No. 142 (part), including all tributaries of Caboolture River' dated July 2010;
- "o" Water Quality Parameters as recommended in the Northeast Business Park -Residential West Water Quality Plan (V7) prepared by Cardino, 3 February 2015);
- "-" Indicates the value is not applicable;
- "--" Indicates the reading was not taken due to equipment failure or error;
- Highlighted values indicate a result in excess of the recommended Water Quality Objectives; and
- "^" Litter results are based on a visual assessment of the sampling location on the day of sampling.

Table 5
Water Quality Monitoring Data Summary
Location G - Caboolture River
North Harbour - Water Quality Monitoring - 2023/2024 Reporting Period
North Harbour, 44 Brooke Crescent, Burpengary East QLD

*WATER QUALITY PARAMETERS				Temperature (C°)	Dissolved Oxygen (% Saturation)	Conductivity (µS/cm)	pH (-log[H+])	^Litter (>5mm)	Chlorophyll-a (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES	Lowland Freshwater	<50 NTU	-	-	85-110%	-	6.5-8.0	-	5
	Middle Estuary	<8NTU	-	-	85-105%	-	7.0 - 8.4	-	4
Location	Sample ID	Date							
Caboolture River	G	31/07/2023	15.0	19.3	86.8	44400	7.67	No	3
	G	18/08/2023	7.9	20.4	75.4	40500	7.88	No	4
	G	7/09/2023	1.5	22.9	68.1	30577	6.84	Broken glass	4
	G	30/10/2023	39.8	26.2	71.1	45400	7.73	No	3
	G	14/11/2023	1.8	25.9	76.8	49273	7.54	No	7
	G	18/12/2023	38.4	27.3	38.4	2780	7.05	No	9
	G	18/01/2024	28.0	28	52	1118	8.03	No	1
	G	7/03/2024	37.8	25.3	60	355.1	7.22	Plastic bag	<1
	G	10/04/2024	35.1	20.4	62.2	325	7.27	Plastic bag	<2
	G	3/05/2024	7.1	20.1	74.2	19100	7.53	No	1
	G	6/06/2024	5.3	19.4	84.2	34800	7.65	No	7

Notes:

- "*" Recommended Water Quality Objectives from the Department of Environment and Heritage Protection (EHP) 'Queensland Water Quality Guidelines 2009' dated July 2013 and the Department of Environment and Resource Management (DERM) 'Environmental Protection (Water) Policy 2009 Caboolture River environmental values and water quality objectives Basin No. 142 (part), including all tributaries of Caboolture River' dated July 2010;
- "o" Water Quality Parameters as recommended in the Northeast Business Park -Residential West Water Quality Plan (V7) prepared by Cardino, 3 February 2015);
- "-" Indicates the value is not applicable;
- "--" Indicates the reading was not taken due to equipment failure or error;
- Highlighted values indicate a result in excess of the recommended Water Quality Objectives; and
- "^" Litter results are based on a visual assessment of the sampling location on the day of sampling.

Table 6
Water Quality Monitoring Data Summary
Location H - Caboolture River
North Harbour - Water Quality Monitoring - 2023/2024 Reporting Period
North Harbour, 44 Brooke Crescent, Burpengary East QLD

*WATER QUALITY PARAMETERS			Turbidity (NTU)	Temperature (C°)	Dissolved Oxygen (% Saturation)	Conductivity (µS/cm)	pH (-log[H+])	^Litter (>5mm)	Chlorophyll-a (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES	Lowland Freshwater		<50 NTU	-	85-110%	-	6.5-8.0	-	5
	Middle Estuary		<8NTU	-	85-105%	-	7.0 - 8.4	-	4
Location	Sample ID	Date							
Caboolture River	H	31/07/2023	4.0	18.8	67.4	17300	7.42	Plastic bottle	2
	H	18/08/2023	6.7	21.4	60.6	21500	7.77	No	4
	H	7/09/2023	1.9	23.9	71.6	13762	6.94	Plastic bags and bottles	2
	H	30/10/2023	15.3	26.9	54.8	25400	7.55	No	5
	H	14/11/2023	8.9	26.5	48.7	27413	7.26	Plastic wrappers	8
	H	18/12/2023	60.2	27.1	56.1	379	7.29	Broken glass	3
	H	18/01/2024	22.5	28.6	81	318	7.88	Broken glass	6
	H	7/03/2024	49.1	24.4	77	156.5	8.45	Plastic bottle and aluminium cans	<2
	H	10/04/2024	32.2	21.5	78.1	214	7.39	Plastic bottle and aluminium cans	3
	H	3/05/2024	7.4	20.4	71.5	446	7.68	Fishing line and plastic bag	2
	H	6/06/2024	9.9	19.7	72.6	3230	7.61	Plastic bottle	13

Notes:

- "*" Recommended Water Quality Objectives from the Department of Environment and Heritage Protection (EHP) 'Queensland Water Quality Guidelines 2009' dated July 2013 and the Department of Environment and Resource Management (DERM) 'Environmental Protection (Water) Policy 2009 Caboolture River environmental values and water quality objectives Basin No. 142 (part), including all tributaries of Caboolture River' dated July 2010;
- "o" Water Quality Parameters as recommended in the Northeast Business Park -Residential West Water Quality Plan (V7) prepared by Cardino, 3 February 2015);
- "-" Indicates the value is not applicable;
- "--" Indicates the reading was not taken due to equipment failure or error;
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- "^" Litter results are based on a visual assessment of the sampling location on the day of sampling.

Table 7
Water Quality Monitoring Data Summary
Location I - Caboolture River
North Harbour - Water Quality Monitoring - 2023/2024
Reporting Period
North Harbour, 44 Brooke Crescent, Burpengary East QLD

*WATER QUALITY PARAMETERS			Turbidity (NTU)	Temperature (C°)	Dissolved Oxygen (% Saturation)	Conductivity (µS/cm)	pH (-log[H+])	^Litter (>5mm)	Chlorophyll-a (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES	Lowland Freshwater		<50 NTU	-	85-110%	-	6.5-8.0	-	5
	Middle Estuary		<8NTU	-	85-105%	-	7.0 - 8.4	-	4
Location	Sample ID	Date							
	I	31/07/2023	3.0	19.6	92.7	53400	7.99	No	2
	I	18/08/2023	1.9	20.5	87.3	54600	7.92	No	2
	I	7/09/2023	1.1	22.1	70.3	52448	7.17	Plastic bottle	4
	I	30/10/2023	3.5	26.6	93.1	53200	8.08	No	2
	I	14/11/2023	1.2	25.5	97.2	59305	8.17	No	4
	I	18/12/2023	39.0	26.2	71.3	39900	7.73	Fishing line	16
	I	18/01/2024	3.9	29.8	109	44988	7.74	No	<1
	I	7/03/2024	15.5	26.0	86	21280	7.57	Foam box	2
	I	10/04/2024	8.4	21.1	87.5	14800	7.47	Plastic bottle	2
	I	3/05/2024	12.3	20.8	83.1	33800	7.37	No	2
	I	6/06/2024	1.8	20.3	93.5	46600	7.9	No	2

Notes:

- "*" Recommended Water Quality Objectives from the Department of Environment and Heritage Protection (EHP) 'Queensland Water Quality Guidelines 2009' dated July 2013 and the Department of Environment and Resource Management (DERM) 'Environmental Protection (Water) Policy 2009 Caboolture River environmental values and water quality objectives Basin No. 142 (part), including all tributaries of Caboolture River' dated July 2010;
- "om" Water Quality Parameters as recommended in the Northeast Business Park -Residential West Water Quality Plan (V7) prepared by Cardino, 3 February 2015);
- "-" Indicates the value is not applicable;
- "-" Indicates the reading was not taken due to equipment failure or error;
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- "^" Litter results are based on a visual assessment of the sampling location on the day of sampling.



Figures

Figure 1: Site Water Quality Monitoring Locations



Figure 2: External and Site Water Quality Monitoring Locations





Photographs

Photograph 1: A photograph of Location A in July 2023



Photograph 2: Location C taken in July 2023.



Photograph 3: A photograph of upstream of Location C in October 2023 showing the newly completed bridge crossing of Raff Creek.



Photograph 4: Location D in July 2023 with sediment control boom installed downstream of the sample location.



Photograph 5: A photograph of Location F taken in December 2023.



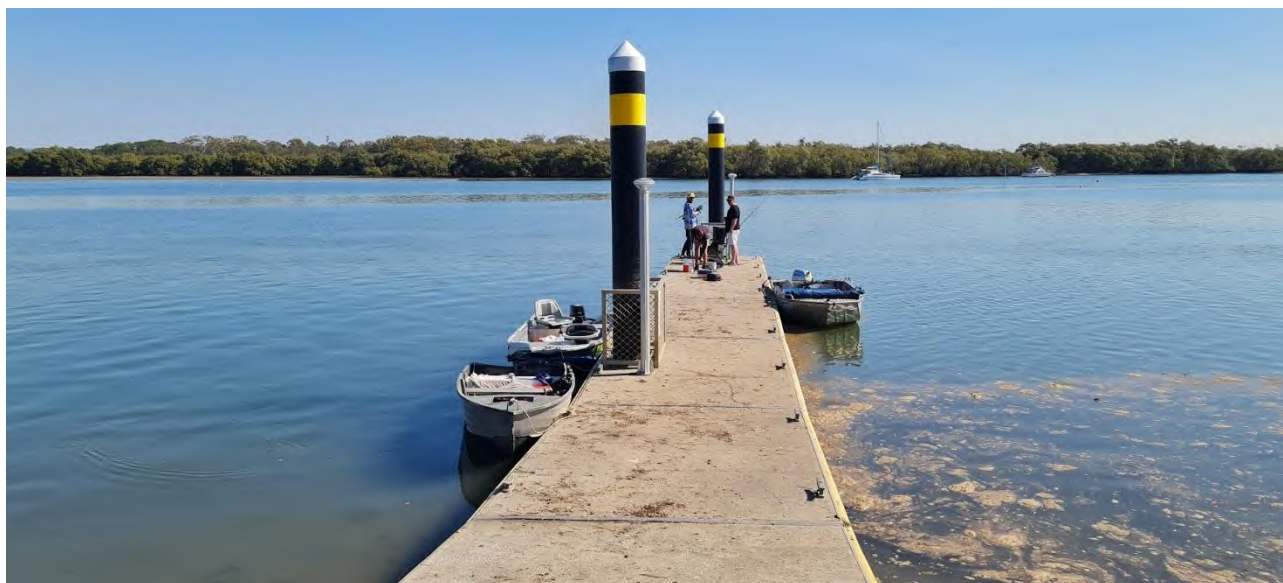
Photograph 6: This photograph was taken from Location G in August 2023.



Photograph 7: Location H taken in December 2023.



Photograph 8: This photograph was taken in July 2023 showing Location I.





Laboratory Reports



CERTIFICATE OF ANALYSIS

Work Order : **EB2323200**
Client : **LITHAQUA ENVIRONMENTAL SERVICES**
Contact : **MR JAMES HALL-BROWN**
Address :
PEREGIAN BEACH
Telephone : 07 3191 9038
Project : LP140120 - NHH SURFACE WATER
Order number : ----
C-O-C number : ----
Sampler : JAMES HALL-BROWN
Site : ----
Quote number : EN/222
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 31-Jul-2023 12:40
Date Analysis Commenced : 31-Jul-2023
Issue Date : 09-Aug-2023 09:53



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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

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.

Signatories	Position	Accreditation Category
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Beatriz Llarinas	Senior Chemist - Inorganics	WB Water Lab Brisbane, Stafford, QLD



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.



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID

				A	C	D	F	G
Sampling date / time				31-Jul-2023 00:00	31-Jul-2023 00:00	31-Jul-2023 00:00	31-Jul-2023 00:00	31-Jul-2023 00:00
Compound	CAS Number	LOR	Unit	EB2323200-001	EB2323200-002	EB2323200-003	EB2323200-004	EB2323200-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.24	7.20	7.37	7.13	7.67
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	219	14900	25400	284	44400
EA045: Turbidity								
Turbidity	----	0.1	NTU	19.0	5.0	4.0	115	15.0
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	12	2	6	7	3
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	58.0	74.9	85.1	83.7	86.8



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	H	I	----	----	----
Sampling date / time					31-Jul-2023 00:00	31-Jul-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2323200-006	EB2323200-007	-----	-----	-----
				Result	Result		----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.42	7.99	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		17300	53400	----	----	----
EA045: Turbidity									
Turbidity	----	0.1	NTU		4.0	3.0	----	----	----
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		2	2	----	----	----
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen - % Saturation	----	0.1	% saturation		67.4	92.7	----	----	----



CHAIN OF CUSTODY

ALS Laboratory: please tick →

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Ph: 08 9405 1301 E: samples.perth@alsglobal.comSYDNEY 277-289 Woodpark Road Smithfield NSW 2164
Ph: 02 8784 8555 E: samples.sydney@alsglobal.comTOWNSVILLE 13 Carlton Street Kirwan QLD 4817
Ph: 07 4773 0000 E: ALSEnviro.Townsville@alsglobal.comWOLLONGONG 1/19-21 Ralph Black Drive, Nih Wollongong NSW 2500
Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: LITHAQUA	TURNAROUND REQUIREMENTS: ☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: PURLOIAN BEACH	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	Custody Seal Intact? Yes No N/A
PROJECT: NHH SURFACE WATER PROJECT NO: P140120	ALS QUOTE NO.:	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:	COUNTRY OF ORIGIN:	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: JAMES HALL-BROWN	CONTACT PH: 0401671622	Other comment:
SAMPLER: "	SAMPLER MOBILE: "	RECEIVED BY: JHB
COC Emailed to ALS? (YES NO)	EDD FORMAT (or default):	DATE/TIME: 31/7/23 12:40
Email Reports to (will default to PM if no other addresses are listed): James@lithaqua.com	RELINQUISHED BY: JAMES HALL-BROWN	RECEIVED BY:
Email Invoice to (will default to PM if no other addresses are listed): "	DATE/TIME: 31/7/23 12:40	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).					Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	PH	E.C.	DO (1 only)	TURBIDITY	CHLOROPHYLL - A	Environmental Division Brisbane Work Order Reference EB2323200  Telephone : - 61-7-3243 7222
	A	31/7/23	W	P	2	X	X	X	X	X	
	C	"	"	"	"	X	X	X	X	X	
	D	"	"	"	"	X	X	X	X	X	
	E	"	"	"	"	X	X	X	X	X	
	G	"	"	"	"	X	X	X	X	X	
	H	"	"	"	"	X	X	X	X	X	
	I	"	"	"	"	X	X	X	X	X	
TOTAL					14						

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Trisulfate Preserved Bottles.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2323200**

Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LP140120 - NHH SURFACE WATER	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 31-Jul-2023 12:40	Issue Date	: 31-Jul-2023
Client Requested Due Date	: 04-Aug-2023	Scheduled Reporting Date	: 04-Aug-2023

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 11.0°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 7 / 7

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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.**



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 - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2323200-001	31-Jul-2023 00:00	A	✓	✓	✓	✓	✓
EB2323200-002	31-Jul-2023 00:00	C	✓	✓	✓	✓	✓
EB2323200-003	31-Jul-2023 00:00	D	✓	✓	✓	✓	✓
EB2323200-004	31-Jul-2023 00:00	F	✓	✓	✓	✓	✓
EB2323200-005	31-Jul-2023 00:00	G	✓	✓	✓	✓	✓
EB2323200-006	31-Jul-2023 00:00	H	✓	✓	✓	✓	✓
EB2323200-007	31-Jul-2023 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com



QUALITY CONTROL REPORT

Work Order	: EB2323200	Page	: 1 of 3
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 31-Jul-2023
Order number	: ----	Date Analysis Commenced	: 31-Jul-2023
C-O-C number	: ----	Issue Date	: 09-Aug-2023
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		



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
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Beatriz Llarinas	Senior Chemist - Inorganics	WB Water Lab Brisbane, Stafford, QLD



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 (%)
EA005P: pH by PC Titrator (QC Lot: 5205745)									
EB2322327-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.39	7.51	1.6	0% - 20%
EB2323244-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.70	7.74	0.5	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5205744)									
EB2322327-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	942	965	2.4	0% - 20%
EB2323244-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	53800	54700	1.6	0% - 20%
EA045: Turbidity (QC Lot: 5205388)									
EB2322979-001	Anonymous	EA045: Turbidity	----	0.1	NTU	<0.1	<0.1	0.0	No Limit
EP025: Oxygen - Dissolved (DO) (QC Lot: 5205387)									
EB2323151-007	Anonymous	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	12.0	12.0	0.0	0% - 20%



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**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) LowHigh	
Method: Compound	CAS Number	LOR	Unit	Result				
EA005P: pH by PC Titrator (QCLot: 5205745)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.7	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5205744)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	97.8	90.0	106
				<1	24800 µS/cm	103	90.0	106
EA045: Turbidity (QCLot: 5205388)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	101	90.0	110
				<0.1	40 NTU	100	90.0	110
				<0.1	400 NTU	101	90.0	110
EP008: Chlorophyll (QCLot: 5207263)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	88.5	85.0	123

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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2323200	Page	: 1 of 5
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 31-Jul-2023
Site	: ----	Issue Date	: 09-Aug-2023
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

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

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

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural							
A,	C,	----	----	----	01-Aug-2023	31-Jul-2023	1
D,	F,						
G,	H,						
I							

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		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P)		31-Jul-2023	----	----	----	01-Aug-2023	31-Jul-2023	✘
A,	C,							
D,	F,							
G,	H,							
I								
EA010P: Conductivity by PC Titrator								
Clear Plastic Bottle - Natural (EA010-P)		31-Jul-2023	----	----	----	01-Aug-2023	28-Aug-2023	✔
A,	C,							
D,	F,							
G,	H,							
I								
EA045: Turbidity								
Clear Plastic Bottle - Natural (EA045)		31-Jul-2023	----	----	----	31-Jul-2023	02-Aug-2023	✔
A,	C,							
D,	F,							
G,	H,							
I								

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a								
White Plastic Bottle - Unpreserved (EP008)		31-Jul-2023	----	----	----	01-Aug-2023	02-Aug-2023	✓
A,	C,							
D,	F,							
G,	H,							
I								
EP025: Oxygen - Dissolved (DO)								
Clear Plastic Bottle - Natural (EP025)		31-Jul-2023	----	----	----	31-Jul-2023	31-Jul-2023	✓
A,	C,							
D,	F,							
G,	H,							
I								



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		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Oxygen - Dissolved	EP025	1	7	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	10	30.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	10	10.00	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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)



CERTIFICATE OF ANALYSIS

Work Order : **EB2325452**
Client : **LITHAQUA ENVIRONMENTAL SERVICES**
Contact : **MR JAMES HALL-BROWN**
Address :
PEREGIAN BEACH
Telephone : 07 3191 9038
Project : LP140120 - NHH SURFACE WATER
Order number : ----
C-O-C number : ----
Sampler : JAMES HALL-BROWN
Site : ----
Quote number : EN/222
No. of samples received : 6
No. of samples analysed : 6

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 18-Aug-2023 15:35
Date Analysis Commenced : 18-Aug-2023
Issue Date : 06-Sep-2023 10:24



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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

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.

Signatories	Position	Accreditation Category
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Beatriz Llarinas	Senior Chemist - Inorganics	WB Water Lab Brisbane, Stafford, QLD



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.



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID				A	C	D	G	H
Sampling date / time				18-Aug-2023 00:00	18-Aug-2023 00:00	18-Aug-2023 00:00	18-Aug-2023 00:00	18-Aug-2023 00:00
Compound	CAS Number	LOR	Unit	EB2325452-001	EB2325452-002	EB2325452-003	EB2325452-004	EB2325452-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.61	7.86	7.80	7.88	7.77
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	229	38200	30200	40500	21500
EA045: Turbidity								
Turbidity	----	0.1	NTU	22.0	6.8	4.6	7.9	6.7
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	7	4	41	4	4
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	17.0	62.2	73.9	75.4	60.6



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID

				I	----	----	----	----
Sampling date / time				18-Aug-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2325452-006	-----	-----	-----	-----
Result					----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.92	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	54600	----	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	1.9	----	----	----	----
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	2	----	----	----	----
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	87.3	----	----	----	----



CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 3/1 Burma Road Pecora SA 5095
Ph: 08 6162 6130 E: adelaide@alsglobal.comBRISBANE 2 Byth Street Stafford QLD 4055
Ph: 07 5243 7222 E: samples.brisbane@alsglobal.comGLADSTONE 48 Callamondah Drive Gladstone QLD 4680
Ph: 07 4878 7944 E: ALSEnviro.Gladstone@alsglobal.comMACKAY Unit 2/20 Caterpillar Drive Pager QLD 4740
Ph: 07 4652 5795 E: ALSenviro.Mackay@alsglobal.comMELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.comMUDGEE 1/29 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee.mat@alsglobal.comNEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304
Ph: 02 4014 2500 E: samples.newcastle@alsglobal.comNOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 02 4423 2063 E: nowra@alsglobal.comPERTH 26 Rigali Way Wangara WA 6065
Ph: 08 9408 1301 E: samples.perth@alsglobal.comSYDNEY
Ph: 02 87TOWN:
Ph: 07 47WOLLU
Ph: 02 42Environmental Division
BrisbaneWork Order Reference
EB2325452

Telephone + 61-7-3243 7222

CLIENT: LITHAGUA	TURNAROUND REQUIREMENTS: ☒ Standard TAT (List due date):	FOR LABORA
OFFICE: DEBORAH BROWN	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	Custody Seal Int
PROJECT: NH4 SURFACE WATER	☐ Non Standard or urgent TAT (List due date):	Free ice / frozen receipt?
ORDER NUMBER:	ALS QUOTE NO.:	Random Sample
PURCHASE ORDER NO.:	COUNTRY OF ORIGIN:	Other comment:
PROJECT MANAGER: JAMES HALL-BROWN	CONTACT PH: 0401671624	
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY:
COC Emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RECEIVED BY: ED
Email Reports to (will default to PM if no other addresses are listed): James@lithagua.com	DATE/TIME: 18/8/23 1525	DATE/TIME: 18/08 1535
Email Invoice to (will default to PM if no other addresses are listed):		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).					Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	pH	E.C.	D.O. (l only)	TURBIDITY	CHLOROPHYLL-A	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	A	18/8/23	W	Px2	2	X	X	X	X	X	
2	C	"	"		2	X	X	X	X	X	
3	D	"	"		2	X	X	X	X	X	
4	G	"	"		2	X	X	X	X	X	
5	H	"	"		2	X	X	X	X	X	
6	I	"	"		2	X	X	X	X	X	
TOTAL					12						

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; G = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2325452**

Client : **LITHAQUA ENVIRONMENTAL SERVICES**

Contact : **MR JAMES HALL-BROWN**

Address :
PEREGIAN BEACH

E-mail : **james@lithaqua.com**

Telephone : **07 3191 9038**

Facsimile : **----**

Project : **LP140120 - NHH SURFACE WATER**

Order number : **----**

C-O-C number : **----**

Site : **----**

Sampler : **JAMES HALL-BROWN**

Laboratory : **Environmental Division Brisbane**

Contact : **Customer Services EB**

Address :
2 Byth Street Stafford QLD Australia
4053

E-mail : **ALSEnviro.Brisbane@alsglobal.com**

Telephone : **+61-7-3243 7222**

Facsimile : **+61-7-3243 7218**

Page : **1 of 2**

Quote number : **EB2017LITENV0001 (EN/222)**

QC Level : **NEPM 2013 B3 & ALS QC Standard**

Dates

Date Samples Received : **18-Aug-2023 15:35**

Client Requested Due : **25-Aug-2023**

Date

Issue Date : **18-Aug-2023**

Scheduled Reporting Date : **25-Aug-2023**

Delivery Details

Mode of Delivery : **Client Drop Off**

No. of coolers/boxes : **2**

Receipt Detail : **HARD ESKIES**

Security Seal : **Not Available**

Temperature : **13.1, 11.5°C - Ice present**

No. of samples received / analysed : **6 / 6**

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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.**



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 - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation%
EB2325452-001	18-Aug-2023 00:00	A	✓	✓	✓	✓	✓
EB2325452-002	18-Aug-2023 00:00	C	✓	✓	✓	✓	✓
EB2325452-003	18-Aug-2023 00:00	D	✓	✓	✓	✓	✓
EB2325452-004	18-Aug-2023 00:00	G	✓	✓	✓	✓	✓
EB2325452-005	18-Aug-2023 00:00	H	✓	✓	✓	✓	✓
EB2325452-006	18-Aug-2023 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@liithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@liithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@liithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@liithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@liithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@liithaqua.com
- EDI Format - XTab (XTAB)	Email	james@liithaqua.com



QUALITY CONTROL REPORT

Work Order	: EB2325452	Page	: 1 of 3
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 18-Aug-2023
Order number	: ----	Date Analysis Commenced	: 18-Aug-2023
C-O-C number	: ----	Issue Date	: 06-Sep-2023
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		



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
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Beatriz Llarinas	Senior Chemist - Inorganics	WB Water Lab Brisbane, Stafford, QLD



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 (%)
EA005P: pH by PC Titrator (QC Lot: 5245314)									
EB2325209-004	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.40	8.47	0.8	0% - 20%
EB2325446-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.04	8.03	0.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5245315)									
EB2325209-004	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	579	582	0.7	0% - 20%
EB2325446-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	18200	18200	0.1	0% - 20%
EA045: Turbidity (QC Lot: 5244528)									
EB2325430-004	Anonymous	EA045: Turbidity	----	0.1	NTU	90.7	90.8	0.1	0% - 20%
EP025: Oxygen - Dissolved (DO) (QC Lot: 5244519)									
EB2325446-001	Anonymous	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	92.2	92.1	0.1	0% - 20%



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**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit		Result		LCS	Low
EA005P: pH by PC Titrator (QCLot: 5245314)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.7	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5245315)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	94.5	90.0	106
				<1	12890 µS/cm	98.8	90.0	106
EA045: Turbidity (QCLot: 5244528)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	104	90.0	110
				<0.1	40 NTU	101	90.0	110
				<0.1	400 NTU	98.2	90.0	110
EP008: Chlorophyll (QCLot: 5244944)								
EP008: Chlorophyll a	----	1	mg/m³	<1	21 mg/m³	102	95.0	105

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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2325452	Page	: 1 of 5
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 18-Aug-2023
Site	: ----	Issue Date	: 06-Sep-2023
Sampler	: JAMES HALL-BROWN	No. of samples received	: 6
Order number	: ----	No. of samples analysed	: 6

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

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

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
	Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural	A, C, D, G, H, I	----	----	----	22-Aug-2023	18-Aug-2023
				4		

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		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) A, C, D, G, H, I	18-Aug-2023	----	----	----	22-Aug-2023	18-Aug-2023	✖
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) A, C, D, G, H, I	18-Aug-2023	----	----	----	22-Aug-2023	15-Sep-2023	✔
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045) A, C, D, G, H, I	18-Aug-2023	----	----	----	18-Aug-2023	20-Aug-2023	✔
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008) A, C, D, G, H, I	18-Aug-2023	----	----	----	18-Aug-2023	20-Aug-2023	✔

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP025: Oxygen - Dissolved (DO)								
Clear Plastic Bottle - Natural (EP025)		18-Aug-2023	---	---	---	18-Aug-2023	18-Aug-2023	✓
A,	C,							
D,	G,							
H,	I							



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		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Oxygen - Dissolved	EP025	1	8	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	10	30.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	10	10.00	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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)



CERTIFICATE OF ANALYSIS

Work Order : **EB2327668**
Client : **LITHAQUA ENVIRONMENTAL SERVICES**
Contact : **MR JAMES HALL-BROWN**
Address :
PEREGIAN BEACH
Telephone : 07 3191 9038
Project : LP140120 - NHH SURFACE WATER
Order number : ----
C-O-C number : ----
Sampler : JAMES HALL-BROWN
Site : ----
Quote number : EN/222
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 07-Sep-2023 12:45
Date Analysis Commenced : 07-Sep-2023
Issue Date : 18-Sep-2023 13:52



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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

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.

Signatories

Position

Accreditation Category

Kim McCabe

Senior Inorganic Chemist

WB Water Lab Brisbane, Stafford, QLD



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.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	A	C	D	F	G
Sampling date / time					07-Sep-2023 00:00	07-Sep-2023 00:00	07-Sep-2023 00:00	07-Sep-2023 00:00	07-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2327668-001	EB2327668-002	EB2327668-003	EB2327668-004	EB2327668-005
					Result	Result	Result	Result	Result
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		8	3	10	17	4



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	H	I	----	----	----
Sampling date / time					07-Sep-2023 00:00	07-Sep-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2327668-006	EB2327668-007	-----	-----	-----
					Result	Result	----	----	----
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		2	4	----	---	---



CHAIN OF CUSTODY

ALS Laboratory, please tick: →

ADELAIDE 3/1 Dunn Road Pterida SA 5085
Ph: 08 8162 8130 E: adelaide@alsglobal.comBRISBANE 2/811 Stirling Street QLD 4058
Ph: 07 3243 7222 E: brisbane@alsglobal.comGLADSTONE 4/5 Callamondra Drive Gladstone QLD 4660
Ph: 07 4678 7844 E: alsenviro.gladstone@alsglobal.comMELBOURNE 2/4 Westall Road Springvale VIC 3171
Ph: 03 8549 9900 E: samples.melbourne@alsglobal.comMELBOURNE 2/4 Westall Road Springvale VIC 3171
Ph: 03 8549 9900 E: samples.melbourne@alsglobal.comMUDGEE 1/29 Sydney Road Mudgwick NSW 2850
Ph: 02 6372 6733 E: mudgwick@alsglobal.comNEWCASTLE 5/586 Maitland Road Mayfield NSW 2304
Ph: 02 4014 2500 E: samples.newcastle@alsglobal.comNOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 02 4423 2033 E: nowra@alsglobal.comPERTH 23 Rigall Way Wangara WA 6005
Ph: 08 9406 1391 E: samples.perth@alsglobal.comSYDNEY 2/77-289 Woodpark Road Smithfield NSW 2167
Ph: 02 8784 8555 E: samples.sydney@alsglobal.comSYDNEY 2/77-289 Woodpark Road Smithfield NSW 2167
Ph: 02 8784 8555 E: samples.sydney@alsglobal.comSYDNEY 2/77-289 Woodpark Road Smithfield NSW 2167
Ph: 02 8784 8555 E: samples.sydney@alsglobal.comEnvironmental Division
Brisbane

Work Order Reference

EB2327668

N/A

N/A



Telephone : + 61-7-3243 7222

CLIENT: LITHAGUA	TURNAROUND REQUIREMENTS: ☒ Standard TAT (List due date):	FOR LABOR
OFFICE: PERMAN	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal In
PROJECT: NHH SLAGS WATER PROJECT NO: LP140120	ALS QUOTE NO.:	Free ice / froze receipt?
ORDER NUMBER:	PURCHASE ORDER NO.:	Random Samp.
PROJECT MANAGER: JAMES HALL-BROWN CONTACT PH: 0401671624	COUNTRY OF ORIGIN:	Other comm.
SAMPLER:	SAMPLER MOBILE: "	RELINQUISHED BY:
COC Emailed to ALS? (YES NO)	EDD FORMAT (or default):	RECEIVED BY:
Email Reports to (will default to PM if no other addresses are listed): James@lithagua.com	DATE/TIME: 7/9/23 12:45	DATE/TIME: 7/9 12:45
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY		SAMPLE DETAILS MATRIX: Solid(S) Water(W)		CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES											Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.	
1	A	7/9/23	W	P	1	X											
2	C	"	"	"	1	X											
3	D	"	"	"	1	X											
4	F	"	"	"	1	X											
5	G	"	"	"	1	X											
6	H	"	"	"	1	X											
7	I	"	"	"	1	X											
TOTAL					7	7											

Water Container Codes: P = Unpreserved Plastic; H = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottles; ASS = Plastic Bag for Acid Sulphate Soils; S = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2327668**

Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LP140120 - NHH SURFACE WATER	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 07-Sep-2023 12:45	Issue Date	: 07-Sep-2023
Client Requested Due Date	: 14-Sep-2023	Scheduled Reporting Date	: 14-Sep-2023

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 9.8°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 7 / 7

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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.**



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 - EP008 Chlorophyll a
EB2327668-001	07-Sep-2023 00:00	A	✓
EB2327668-002	07-Sep-2023 00:00	C	✓
EB2327668-003	07-Sep-2023 00:00	D	✓
EB2327668-004	07-Sep-2023 00:00	F	✓
EB2327668-005	07-Sep-2023 00:00	G	✓
EB2327668-006	07-Sep-2023 00:00	H	✓
EB2327668-007	07-Sep-2023 00:00	I	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com



QUALITY CONTROL REPORT

Work Order	: EB2327668	Page	: 1 of 3
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 07-Sep-2023
Order number	: ----	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: ----	Issue Date	: 18-Sep-2023
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		



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
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD



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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**



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

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EP008: Chlorophyll (QCLot: 5284151)								
EP008: Chlorophyll a	----	1	mg/m³	<1	21 mg/m³	102	95.0	105

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.

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2327668	Page	: 1 of 4
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 07-Sep-2023
Site	: ----	Issue Date	: 18-Sep-2023
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

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

- **NO** Quality Control Sample Frequency Outliers exist.



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		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a								
White Plastic Bottle - Unpreserved (EP008)		07-Sep-2023	----	----	----	07-Sep-2023	09-Sep-2023	✔
A,	C,							
D,	F,							
G,	H,							
I								



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		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	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
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.



CERTIFICATE OF ANALYSIS

Work Order : **EB2333644**
Client : **LITHAQUA ENVIRONMENTAL SERVICES**
Contact : **MR JAMES HALL-BROWN**
Address :
PEREGIAN BEACH
Telephone : 07 3191 9038
Project : LP140120 NHH SURFACE WATER
Order number : ----
C-O-C number : ----
Sampler : JAMES HALL-BROWN
Site : ----
Quote number : EN/222
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 2
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 30-Oct-2023 11:30
Date Analysis Commenced : 30-Oct-2023
Issue Date : 06-Nov-2023 16:28



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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

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.

Signatories	Position	Accreditation Category
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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.

Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID				C	D	G	H	I
Sampling date / time				30-Oct-2023 00:00	30-Oct-2023 00:00	30-Oct-2023 00:00	30-Oct-2023 00:00	30-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EB2333644-001	EB2333644-002	EB2333644-003	EB2333644-004	EB2333644-005
Result				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.60	7.60	7.73	7.55	8.08
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	37600	40400	45400	25400	53200
EA045: Turbidity								
Turbidity	----	0.1	NTU	11.0	5.6	39.8	15.3	3.5
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	2	3	3	5	2
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	65.4	63.4	71.1	54.8	93.1

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 3/1 Burma Road Pooraka SA 5095
Ph. 08 8162 5130 E: adelaidel@alsglobal.com

BRISBANE 2 Byth Street Stalford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 48 Callenmorda Drive Gladstone QLD 4680
Ph: 07 4978 7944 E: Ais@enviro Gladstone@aisglobal.com

OMACKAY Unit 2/20 Caterpillar Drive Paget QLD 4740
Ph: 07 4952 5795 E: ALSEm@omackay.com.au

MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: sample_melbourne@alsglobal.com

UMUDGEF 1/29 Sydney Rd. J Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee_mail@alsglobal.com

NEWCASTLE 5/585 Maitland Road Mayfield West NSW 1583
Ph: 02 4014 2500 | samples.newcastle@nprobe.com

☐ NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph 02 4423 2063 E nwra@atsjglobal.com

PERT 4 26 Rigali Way Manjara WA 6011
Ph: 08 9406 1301 E: samples.perth@alsglobal.com

☐ -YDNF- 077-058 Woodmark Road Smithfield N.W. 64
Pr. 01/87

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Environmental Division
Brisbane

Work Order Reference

EB2333644



Telephone : + 61-7-3243 7222

CLIENT: LITHAGUA		TURNAROUND REQUIREMENTS : ☒ Standard TAT (List due date):		FOR LABORATORY USE	
OFFICE: PERUCIAN BEACH		(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		Custody Seal Int:	
PROJECT: NHH SURFACE WATER		PROJECT NO: LP140120		Free ice / frozen receipt?	
ORDER NUMBER:		PURCHASE ORDER NO.:		Random Sample	
PROJECT MANAGER: JAMES WALLBROWN		CONTACT PH: 8401671624		Other comment:	
SAMPLER: "		SAMPLER MOBILE: "		RELINQUISHED BY: JAMES WALLBROWN	
COC Emailed to ALS? (YES / (NO))		EDD FORMAT (or default):		RECEIVED BY: Batem	
Email Reports to (will default to PM if no other addresses are listed): james@lithagua.com		DATE/TIME: 30/10/23 1130		DATE/TIME: 30/10/2023 11:30	
Email Invoice to (will default to PM if no other addresses are listed):					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

[illegible]

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfree/unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; R = Unpreserved Rag; U = Lugols Iodine Preserved Bottles; SHT = Sterile Sodium Thiosulfate Preserved Bottles.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2333644**

Client : **LITHAQUA ENVIRONMENTAL SERVICES**

Contact : **MR JAMES HALL-BROWN**

Address :
PEREGIAN BEACH

E-mail : **james@lithaqua.com**

Telephone : **07 3191 9038**

Facsimile : **----**

Project : **LP140120 NHH SURFACE WATER**

Order number : **----**

C-O-C number : **----**

Site : **----**

Sampler : **JAMES HALL-BROWN**

Laboratory : **Environmental Division Brisbane**

Contact : **Customer Services EB**

Address : **2 Byth Street Stafford QLD Australia
4053**

E-mail : **ALSEnviro.Brisbane@alsglobal.com**

Telephone : **+61-7-3243 7222**

Facsimile : **+61-7-3243 7218**

Page : **1 of 2**

Quote number : **EB2017LITENV0001 (EN/222)**

QC Level : **NEPM 2013 B3 & ALS QC Standard**

Dates

Date Samples Received : **30-Oct-2023 11:30**

Client Requested Due Date : **06-Nov-2023**

Issue Date : **30-Oct-2023**

Scheduled Reporting Date : **06-Nov-2023**

Delivery Details

Mode of Delivery : **Client Drop Off**

No. of coolers/boxes : **1**

Receipt Detail : **MEDIUM ESKY**

Security Seal : **Not Available**

Temperature : **15.0°C - Ice present**

No. of samples received / analysed : **5 / 5**

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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.**



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 - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2333644-001	30-Oct-2023 00:00	C	✓	✓	✓	✓	✓
EB2333644-002	30-Oct-2023 00:00	D	✓	✓	✓	✓	✓
EB2333644-003	30-Oct-2023 00:00	G	✓	✓	✓	✓	✓
EB2333644-004	30-Oct-2023 00:00	H	✓	✓	✓	✓	✓
EB2333644-005	30-Oct-2023 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com



QUALITY CONTROL REPORT

Work Order	: EB2333644	Page	: 1 of 3
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 NHH SURFACE WATER	Date Samples Received	: 30-Oct-2023
Order number	: ----	Date Analysis Commenced	: 30-Oct-2023
C-O-C number	: ----	Issue Date	: 06-Nov-2023
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 5		
No. of samples analysed	: 5		



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
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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 (%)
EA005P: pH by PC Titrator (QC Lot: 5393228)									
EB2333637-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.50	6.52	0.3	0% - 20%
EB2333678-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.84	7.84	0.0	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5393230)									
EB2333637-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	7990	8150	1.9	0% - 20%
EB2333678-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	22800	23400	2.8	0% - 20%
EA045: Turbidity (QC Lot: 5392740)									
EB2333591-001	Anonymous	EA045: Turbidity	----	0.1	NTU	3.8	3.8	0.0	0% - 20%
EB2333673-001	Anonymous	EA045: Turbidity	----	0.1	NTU	1.4	1.4	0.0	0% - 50%
EP025: Oxygen - Dissolved (DO) (QC Lot: 5392739)									
EB2333644-001	C	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	65.4	65.4	0.0	0% - 20%



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**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5393228)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.8	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5393230)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	97.8	90.0	106
				<1	12890 µS/cm	92.8	90.0	106
EA045: Turbidity (QCLot: 5392740)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	102	90.0	110
				<0.1	40 NTU	99.5	90.0	110
				<0.1	400 NTU	98.5	90.0	110
EP008: Chlorophyll (QCLot: 5397787)								
EP008: Chlorophyll a	----	1	mg/m³	<1	21 mg/m³	103	95.0	105

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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2333644	Page	: 1 of 5
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 NHH SURFACE WATER	Date Samples Received	: 30-Oct-2023
Site	: ----	Issue Date	: 06-Nov-2023
Sampler	: JAMES HALL-BROWN	No. of samples received	: 5
Order number	: ----	No. of samples analysed	: 5

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

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

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method			Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural								
C,	D,		----	----	----	31-Oct-2023	30-Oct-2023	1
G,	H,							
I								

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			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P) C, G, I	D, H,	30-Oct-2023	----	----	----	31-Oct-2023	30-Oct-2023	✖
EA010P: Conductivity by PC Titrator								
Clear Plastic Bottle - Natural (EA010-P) C, G, I	D, H,	30-Oct-2023	----	----	----	31-Oct-2023	27-Nov-2023	✔
EA045: Turbidity								
Clear Plastic Bottle - Natural (EA045) C, G, I	D, H,	30-Oct-2023	----	----	----	30-Oct-2023	01-Nov-2023	✔
EP008: Chlorophyll a & Pheophytin a								
White Plastic Bottle - Unpreserved (EP008) C, G, I	D, H,	30-Oct-2023	----	----	----	01-Nov-2023	01-Nov-2023	✔



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		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Oxygen - Dissolved	EP025	1	5	20.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	20	15.00	15.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)



CERTIFICATE OF ANALYSIS

Work Order : **EB2335679**
Client : **LITHAQUA ENVIRONMENTAL SERVICES**
Contact : **MR JAMES HALL-BROWN**
Address :
PEREGIAN BEACH
Telephone : 07 3191 9038
Project : LP140120 - NHH SURFACE WATER
Order number : ----
C-O-C number : ----
Sampler : JAMES HALL-BROWN
Site : ----
Quote number : EN/222
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 2
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 14-Nov-2023 14:35
Date Analysis Commenced : 15-Nov-2023
Issue Date : 16-Feb-2024 07:20



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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

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.

Signatories

Position

Accreditation Category

Kim McCabe

Senior Inorganic Chemist

Brisbane Inorganics, Stafford, QLD



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.

Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID

				C	D	G	H	I
Sampling date / time				14-Nov-2023 00:00	14-Nov-2023 00:00	14-Nov-2023 00:00	14-Nov-2023 00:00	14-Nov-2023 00:00
Compound	CAS Number	LOR	Unit	EB2335679-001	EB2335679-002	EB2335679-003	EB2335679-004	EB2335679-005
				Result	Result	Result	Result	Result
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	32	10	7	8	4

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 3/1 Burma Road Pooraka SA 5095
Ph: 08 8162 5130 E: adelaide@alsglobal.com

BRISBANE 2 Byth Street Stafford QLD 4053
Ph 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE: 48 Callemondah Drive Gladstone QLD 4680
Ph: 07 4978 7944 E: ALSEnviro.Gladstone@aisglobal.com

UMACKAY Unit 2/20 Caterpillar Drive Paget QLD 4740
Ph: 07 4952 5795 E. ALSEnviro.Mackay@alsglobal.com

☐ MELBOURNE 2-4 Westall Road Springvale VIC 3171
 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

DMUDGE 1729 Sydney Road Mudgee NSW 2850
Ph. 02 6372 6735 E: mudgee_mail@alsglobal.com

NEWCASTLE 5/585 Marland Road Mayfield West NSW 2304
Ph. 02 4014 2500 E: samples.newcastle@alsglobal.com

☐ NCWRA 4/13 Geary Place North Nowra NSW 2541
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PERTH 26 Regal Way Wangara WA 6065
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☐ SYDNEY 277-2000
Ph: 02 8784 8555

☐ TOWNSVILLE 1
Ph: 07 4773 0000

LIWOLLONGONG
Ph. 02 4225 3125

Environmental Division
Brisbane

Work Order Reference

EB2335679



Telephone : 61-7-3243 7222

CLIENT: LITHACWA		TURNAROUND REQUIREMENTS : ☒ Standard TAT (List due date):		FOR LABORATORY	
OFFICE: PORCUPINE ROAD		(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		Custody Seal Intact?	
PROJECT: NH4 SUBRACS WATER		PROJECT NO: LP140120		Free ice / frozen ice brick receipt?	
ORDER NUMBER:		PURCHASE ORDER NO.:		Random Sample Temper	
PROJECT MANAGER: J. HALL-BROWN		CONTACT PH: 0401671624		Other comment:	
SAMPLER: "		SAMPLER MOBILE: "		RELINQUISHED BY:	
COC Emailed to ALS? (YES / NO)		EDD FORMAT (or default):		RECEIVED BY:	
Email Reports to (will default to PM if no other addresses are listed): james@lithacwa.com		DATE/TIME:		DATE/TIME:	
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME:		DATE/TIME:	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

[illegible]

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic

V = Vial Vial HCl Preserved; VS = VOA Vial Sodium Bisulfate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airflight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; FS = FOTA Preserved Bottles; ST = Slide Bottle; ASS = Plastic Bag for Acid Sulfate Spills; U = Unpreserved Bag; U = Liquor Iodine Preserved Bottles; SHT = Sterile Sodium Thiosulfate Preserved Bottles.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2335679**

Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LP140120 - NHH SURFACE WATER	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 14-Nov-2023 14:35	Issue Date	: 14-Nov-2023
Client Requested Due Date	: 21-Nov-2023	Scheduled Reporting Date	: 21-Nov-2023

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 8.0°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 5 / 5

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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.**



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 - EP008 Chlorophyll a
EB2335679-001	14-Nov-2023 00:00	C	✓
EB2335679-002	14-Nov-2023 00:00	D	✓
EB2335679-003	14-Nov-2023 00:00	G	✓
EB2335679-004	14-Nov-2023 00:00	H	✓
EB2335679-005	14-Nov-2023 00:00	I	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com



QUALITY CONTROL REPORT

Work Order	: EB2335679	Page	: 1 of 3
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 14-Nov-2023
Order number	: ----	Date Analysis Commenced	: 15-Nov-2023
C-O-C number	: ----	Issue Date	: 16-Feb-2024
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 5		
No. of samples analysed	: 5		



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
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**



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 Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit			Result	LCS	Low
EP008: Chlorophyll (QCLot: 5427156)								
EP008: Chlorophyll a	----	1	mg/m³	<1	24 mg/m³	100	95.0	105

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.

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2335679	Page	: 1 of 4
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 14-Nov-2023
Site	: ----	Issue Date	: 16-Feb-2024
Sampler	: JAMES HALL-BROWN	No. of samples received	: 5
Order number	: ----	No. of samples analysed	: 5

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

- **NO** Quality Control Sample Frequency Outliers exist.

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.

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.

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a								
White Plastic Bottle - Unpreserved (EP008)		14-Nov-2023	---	---	---	15-Nov-2023	16-Nov-2023	✓
C,	D,							
G,	H,							
I								



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		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	16	6.25	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
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.



CERTIFICATE OF ANALYSIS

Work Order : **EB2340040**
Client : **LITHAQUA ENVIRONMENTAL SERVICES**
Contact : **MR JAMES HALL-BROWN**
Address :
PEREGIAN BEACH
Telephone : 07 3191 9038
Project : LP140120 NHH SURFACE WATER
Order number : ----
C-O-C number : ----
Sampler : JAMES HALL-BROWN
Site : ----
Quote number : EN/222
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 18-Dec-2023 12:01
Date Analysis Commenced : 18-Dec-2023
Issue Date : 16-Feb-2024 07:20



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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

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.

Signatories

Position

Accreditation Category

Beatriz Llarinas

Senior Chemist - Inorganics

Brisbane Inorganics, Stafford, QLD



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.



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID

				A	C	D	F	G
Sampling date / time				18-Dec-2023 00:00	18-Dec-2023 00:00	18-Dec-2023 00:00	18-Dec-2023 00:00	18-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2340040-001	EB2340040-002	EB2340040-003	EB2340040-004	EB2340040-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.56	6.88	7.16	7.02	7.05
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	195	851	335	237	2780
EA045: Turbidity								
Turbidity	----	0.1	NTU	6.4	17.6	7.9	10.7	38.4
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	12	11	8	6	9
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen	----	0.1	mg/L	2.9	5.3	4.7	4.0	3.3
Dissolved Oxygen - % Saturation	----	0.1	% saturation	30.8	56.4	50.3	42.4	34.8



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID

				H	I	----	----	----
Sampling date / time				18-Dec-2023 00:00	18-Dec-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2340040-006	EB2340040-007	-----	-----	-----
Result				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.29	7.73	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	379	39900	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	60.2	39.0	----	----	----
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	3	16	----	----	----
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen	----	0.1	mg/L	5.3	6.6	----	----	----
Dissolved Oxygen - % Saturation	----	0.1	% saturation	56.1	71.3	----	----	----



CHAIN OF CUSTODY

ALS Laboratory: please tick →

JAGRE (06) 933 3333 (Brisbane) Fax: (06) 933 3334

JAGRE (06) 933 3333 (Brisbane) Fax: (06) 933 3334

JAGRE (06) 933 3333 (Brisbane) Fax: (06) 933 3334

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JAGRE (06) 933 3333 (Brisbane) Fax: (06) 933 3334

Environmental Division
Brisbane
Work Order Reference
EB2340040

Telephone : + 61-7-3243 7222

CLIENT: LITHAGUA	TURNAROUND REQUIREMENTS : ☒ Standard TAT (List due date):	FOR LABORA Custody Seal Intz Free ice / frozen receipt? Random Sample Other comment:
OFFICE: PEREGRINE BLOCH	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	
PROJECT: NIWA SURFACE WATER	PROJECT NO: LP140323	COC SEQUENCE NUMBER (Circle) COC: 2 2 3 4 5 6 7 OF: 2 2 3 4 5 6 7
ORDER NUMBER:	PURCHASE ORDER NO.:	COUNTRY OF ORIGIN:
PROJECT MANAGER: JAMES HOLLAND	CONTACT PH: 0401671624	RELINQUISHED BY: J. Holland
SAMPLER: "	SAMPLER MOBILE: "	RECEIVED BY: LT
COC Emailed to ALS? (YES / NO) (NO)	EDD FORMAT (or default):	DATE/TIME: 18/12/23 12:01
Email Reports to (will default to PM if no other addresses are listed): james1@lithagua.com		DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed): "		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)					Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	PH	EC	DO (1. and 4)	TURBIDITY	CONDUCIVITY	HT Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.	
1	A	18/12/23	W	P	2	X	X	X	X	X		
2	C	"	"	"	"	X	X	X	X	X		
3	D	"	"	"	"	X	X	X	X	X		
4	F	"	"	"	"	X	X	X	X	X		
5	G	"	"	"	"	X	X	X	X	X		
6	H	"	"	"	"	X	X	X	X	X		
7	I	"	"	"	"							
TOTAL					16							

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; Li = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2340040**

Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LP140120 NHH SURFACE WATER	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 18-Dec-2023 12:01	Issue Date	: 18-Dec-2023
Client Requested Due Date	: 29-Dec-2023	Scheduled Reporting Date	: 29-Dec-2023

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 1.3°C - Ice present
Receipt Detail	: ESKY	No. of samples received / analysed	: 7 / 7

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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.**



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 - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2340040-001	18-Dec-2023 00:00	A	✓	✓	✓	✓	✓
EB2340040-002	18-Dec-2023 00:00	C	✓	✓	✓	✓	✓
EB2340040-003	18-Dec-2023 00:00	D	✓	✓	✓	✓	✓
EB2340040-004	18-Dec-2023 00:00	F	✓	✓	✓	✓	✓
EB2340040-005	18-Dec-2023 00:00	G	✓	✓	✓	✓	✓
EB2340040-006	18-Dec-2023 00:00	H	✓	✓	✓	✓	✓
EB2340040-007	18-Dec-2023 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - ESDAT (ESDAT)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com



QUALITY CONTROL REPORT

Work Order	: EB2340040	Page	: 1 of 3
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 NHH SURFACE WATER	Date Samples Received	: 18-Dec-2023
Order number	: ----	Date Analysis Commenced	: 18-Dec-2023
C-O-C number	: ----	Issue Date	: 16-Feb-2024
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		



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
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD



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 (%)
EA005P: pH by PC Titrator (QC Lot: 5501200)									
EB2340018-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.17	6.17	0.0	0% - 20%
EB2340072-006	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.53	7.55	0.3	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5501198)									
EB2340018-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	4	4	0.0	No Limit
EA045: Turbidity (QC Lot: 5500784)									
EB2339912-001	Anonymous	EA045: Turbidity	----	0.1	NTU	29.2	29.5	1.0	0% - 20%
EB2340040-006	H	EA045: Turbidity	----	0.1	NTU	60.2	60.2	0.0	0% - 20%
EP025: Oxygen - Dissolved (DO) (QC Lot: 5500782)									
EB2340014-001	Anonymous	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	71.1	71.1	0.0	0% - 20%
		EP025: Dissolved Oxygen	----	0.1	mg/L	6.2	6.2	0.0	0% - 20%



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**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Spike	Spike Recovery (%)	Acceptable Limits (%)	
					Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5501200)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.8	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5501198)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	101	90.0	106
				<1	12890 µS/cm	97.6	90.0	106
EA045: Turbidity (QCLot: 5500784)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	100	90.0	110
				<0.1	40 NTU	102	90.0	110
				<0.1	400 NTU	98.0	90.0	110
EP008: Chlorophyll (QCLot: 5503509)								
EP008: Chlorophyll a	----	1	mg/m³	<1	14 mg/m³	105	95.0	105

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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2340040	Page	: 1 of 5
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 NHH SURFACE WATER	Date Samples Received	: 18-Dec-2023
Site	: ----	Issue Date	: 16-Feb-2024
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

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

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

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Analysis Holding Time Compliance

Matrix: WATER

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural							
A,	C,	----	----	----	19-Dec-2023	18-Dec-2023	1
D,	F,						
G,	H,						
I							

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			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P) A, D, G, I	C, F, H,	18-Dec-2023	----	----	----	19-Dec-2023	18-Dec-2023	✖
EA010P: Conductivity by PC Titrator								
Clear Plastic Bottle - Natural (EA010-P) A, D, G, I	C, F, H,	18-Dec-2023	----	----	----	19-Dec-2023	15-Jan-2024	✔
EA045: Turbidity								
Clear Plastic Bottle - Natural (EA045) A, D, G, I	C, F, H,	18-Dec-2023	----	----	----	18-Dec-2023	20-Dec-2023	✔

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a								
White Plastic Bottle - Unpreserved (EP008)		18-Dec-2023	----	----	----	19-Dec-2023	20-Dec-2023	✓
A,	C,							
D,	F,							
G,	H,							
I								
EP025: Oxygen - Dissolved (DO)								
Clear Plastic Bottle - Natural (EP025)		18-Dec-2023	----	----	----	18-Dec-2023	18-Dec-2023	✓
A,	C,							
D,	F,							
G,	H,							
I								



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		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Oxygen - Dissolved	EP025	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	10	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	12	25.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	12	8.33	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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)



CERTIFICATE OF ANALYSIS

Work Order : **EB2401623**
Client : **LITHAQUA ENVIRONMENTAL SERVICES**
Contact : **MR JAMES HALL-BROWN**
Address :
PEREGIAN BEACH
Telephone : 07 3191 9038
Project : LP140120 - NHH SURFACE WATER
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : EN/222
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 18-Jan-2024 12:53
Date Analysis Commenced : 19-Jan-2024
Issue Date : 16-Feb-2024 07:20



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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

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.

Signatories

Position

Accreditation Category

Kim McCabe

Senior Inorganic Chemist

Brisbane Inorganics, Stafford, QLD



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.

- EP008 (Chlorophyll a): For samples (D, F) less volume was filtered due to matrix interference (Suspended Material). LOR adjusted accordingly.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	A	C	D	F	G
Sampling date / time				18-Jan-2024 00:00	18-Jan-2024 00:00	18-Jan-2024 00:00	18-Jan-2024 00:00	18-Jan-2024 00:00
Compound	CAS Number	LOR	Unit	EB2401623-001	EB2401623-002	EB2401623-003	EB2401623-004	EB2401623-005
				Result	Result	Result	Result	Result
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	<1	1	<2	<2	1



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	H	I	----	----	----
Sampling date / time					18-Jan-2024 00:00	18-Jan-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2401623-006	EB2401623-007	-----	-----	-----
					Result	Result	----	----	----
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		6	<1	----	---	---



CHAIN OF CUSTODY

ALS Laboratory: please tick →

JADELAIDE 31 Burma Road Footscray VIC 3206
Ph: 03 9347 1900 E: adelaide@alsglobal.comJAMESBAIRN 2 Blyn Street Sturt SA 5093
Ph: 08 8245 7122 E: jamesbairn@alsglobal.comGLADSTONE 49 Caloundra Drive Gladstone QLD 4680
Ph: 07 4975 7644 E: gladstone@alsglobal.comJMACKEY 70 Hargrave Road Mackay QLD 4740
Ph: 07 4941 6177 E: mackay@alsglobal.comJIMELBOURNE 24 Westfield Road Netherdale VIC 3111
Ph: 03 9519 6600 E: jimelbourne@alsglobal.comJIMMUDGEE 120 Sydney Road Mudgee NSW 2855
Ph: 02 8372 5735 E: mudgee@alsglobal.comJNEWCASTLE 120 Hargrave Road Newcastle NSW 2064
Ph: 02 4014 2500 E: newcastle@alsglobal.comJNEWCASTLE 413 Garry Place North Sydney NSW 2058
Ph: 02 4425 2063 E: newcastle@alsglobal.comJPERTH 10 Hot Way Mudgee WA 6056
Ph: 08 9399 7678 E: perth@alsglobal.comJOSYDNEY 277 289 Woodpark Road Smithfield NSW 2154
Ph: 02 9764 6655 E: sydney@alsglobal.comJUTOWNSVILLE 14-15 Deser Court Belah QLD 4819
Ph: 07 4756 5055 E: townsville@alsglobal.comJWUOLONGONG 118-121 Rags Bank Drive Nth Wingham NSW 2590
Ph: 02 4756 0125 E: wingham@alsglobal.com

CLIENT: LITHAQUA	TURNAROUND REQUIREMENTS: ☒ Standard TAT (List due date): (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Yes No N/A Free ice / frozen ice bricks present upon receipt? Yes No N/A Random Sample Temperature on Receipt: °C
OFFICE: PERTH - BROWN	☐ Non Standard or urgent TAT (List due date):	
PROJECT: NHH SIGNALS WORK	PROJECT NO: EP14620	
ORDER NUMBER:	PURCHASE ORDER NO.:	
PROJECT MANAGER: JAMES HALL BROWN	COUNTRY OF ORIGIN:	
SAMPLER:	SAMPLER MOBILE:	
COC Emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed): james@lithaqua.com	RELINQUISHED BY:	RECEIVED BY: A THOR
Email Invoice to (will default to PM if no other addresses are listed):	DATE/TIME: 18/1/24	DATE/TIME: 18.1.24 1253

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY		SAMPLE DETAILS MATRIX: Solid(S) Water(W)		CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES											Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.	
	A	18/1/24	W	P	1	X											
	C	"	"	"	1	X											
	D	"	"	"	1	X											
	F	"	"	"	1	X											
	G	"	"	"	1	X											
	H	"	"	"	1	X											
	I	"	"	"	1	X											
TOTAL					7												

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2401623**

Client : **LITHAQUA ENVIRONMENTAL SERVICES**

Contact : **MR JAMES HALL-BROWN**

Address :
PEREGIAN BEACH

E-mail : **james@lithaqua.com**

Telephone : **07 3191 9038**

Facsimile : **----**

Project : **LP140120 - NHH SURFACE WATER**

Order number : **----**

C-O-C number : **----**

Site : **----**

Sampler : **----**

Laboratory : **Environmental Division Brisbane**

Contact : **Customer Services EB**

Address :
**2 Byth Street Stafford QLD Australia
4053**

E-mail : **ALSEnviro.Brisbane@alsglobal.com**

Telephone : **+61-7-3243 7222**

Facsimile : **+61-7-3243 7218**

Page : **1 of 2**

Quote number : **EB2017LITENV0001 (EN/222)**

QC Level : **NEPM 2013 B3 & ALS QC Standard**

Dates

Date Samples Received : **18-Jan-2024 12:53**

Client Requested Due : **25-Jan-2024**

Date

Issue Date : **18-Jan-2024**

Scheduled Reporting Date : **25-Jan-2024**

Delivery Details

Mode of Delivery : **Client Drop Off**

No. of coolers/boxes : **1**

Security Seal : **Not Available**

Temperature : **5.4 °C, 9.1 °C, 6.6 °C - Ice
present**

Receipt Detail : **MEDIUM HARD ESKY**

No. of samples received / analysed : **7 / 7**

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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.**



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 - EP008 Chlorophyll a
EB2401623-001	18-Jan-2024 00:00	A	✓
EB2401623-002	18-Jan-2024 00:00	C	✓
EB2401623-003	18-Jan-2024 00:00	D	✓
EB2401623-004	18-Jan-2024 00:00	F	✓
EB2401623-005	18-Jan-2024 00:00	G	✓
EB2401623-006	18-Jan-2024 00:00	H	✓
EB2401623-007	18-Jan-2024 00:00	I	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com



QUALITY CONTROL REPORT

Work Order	: EB2401623	Page	: 1 of 3
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 18-Jan-2024
Order number	: ----	Date Analysis Commenced	: 19-Jan-2024
C-O-C number	: ----	Issue Date	: 16-Feb-2024
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		



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
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**



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 Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound		CAS Number	LOR		Unit	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
				Result		LCS	Low	High	
EP008: Chlorophyll (QCLot: 5551173)									
EP008: Chlorophyll a		----	1	mg/m³	<1	22 mg/m³	103	95.0	105

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.

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EB2401623**

Page : 1 of 4

Client : **LITHAQUA ENVIRONMENTAL SERVICES**
Contact : **MR JAMES HALL-BROWN**
Project : **LP140120 - NHH SURFACE WATER**
Site : ----
Sampler : ----
Order number : ----

Laboratory : Environmental Division Brisbane
Telephone : +61-7-3243 7222
Date Samples Received : 18-Jan-2024
Issue Date : 16-Feb-2024
No. of samples received : 7
No. of samples analysed : 7

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

- **NO** Quality Control Sample Frequency Outliers exist.

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.

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a								
Opaque Plastic Bottle - Unpreserved (EP008)		18-Jan-2024	----	----	----	19-Jan-2024	20-Jan-2024	✓
A,	C,							
D,	F,							
G,	H,							
I								



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		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	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
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.



CERTIFICATE OF ANALYSIS

Work Order : **EB2407780**
Client : **LITHAQUA ENVIRONMENTAL SERVICES**
Contact : **MR JAMES HALL-BROWN**
Address :
PEREGIAN BEACH
Telephone : **07 3191 9038**
Project : **NHH SURFACE WATER SAMPLING**
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : **EN/222**
No. of samples received : **7**
No. of samples analysed : **7**

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 07-Mar-2024 13:25
Date Analysis Commenced : 07-Mar-2024
Issue Date : 14-Mar-2024 17:23



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

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.

Signatories	Position	Accreditation Category
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD



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. are fully validated and are often at the client request.

In house developed procedures

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.

- EP008 (Chlorophyll a): For sample (H) less volume was filtered due to matrix interference (Suspended Material). LOR adjusted accordingly.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	A	C	D	F	G
Sampling date / time					07-Mar-2024 00:00	07-Mar-2024 00:00	07-Mar-2024 00:00	07-Mar-2024 00:00	07-Mar-2024 00:00
Compound	CAS Number	LOR	Unit		EB2407780-001	EB2407780-002	EB2407780-003	EB2407780-004	EB2407780-005
					Result	Result	Result	Result	Result
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		3	6	3	5	<1



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	H	I	----	----	----
Sampling date / time					07-Mar-2024 00:00	07-Mar-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2407780-006	EB2407780-007	-----	-----	-----
					Result	Result	----	----	----
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		<2	2	----	----	----

Mandatory Fields				CHAIN OF CUSTODY												Page 1 of 1																																																																																																																																																																																																																									
CLIENT CODE: LITENV				*PROJECT MANAGER: JAMES HALL-BROWN				SAMPLER: 11				CoC #: (if applicable)																																																																																																																																																																																																																													
*CLIENT: LITNAQOA				*PM MOBILE: 0401 671624				SAMPLER MOBILE: 6																																																																																																																																																																																																																																	
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*EMAIL REPORTS TO: (default to PM if blank)								*ANALYSIS REQUIRED (NB: ALS Quote No. and/or Analysis Suite Codes must be listed to attract quote/priced price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). Mark an X in the boxes below analysis to indicate the parameter listed above to be tested on that sample.								Country of Origin: (if not Australia)																																																																																																																																																																																																																									
* STORAGE REQUIREMENTS Please check box: → Standard Storage time from receipt of samples: Waters - 3 weeks Soils - 2 months								☒ Standard Storage ☐ Extended Storage Specify Disposal Date: Note: Extended storage incurs a fee and requires a signed agreement.				* TURNAROUND Please check box: → (Not all tests can be expedited, contact Client Services for more information) ☒ 5+ days (no surcharge) ☐ 3 day (+15%) ☐ 2 day (+30%) ☐ 1 day (+50%)																																																																																																																																																																																																																													
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<table><thead><tr><th>ALS Use Only</th><th>Sample ID</th><th>Depth</th><th>Date/Time</th><th>No. Bottles</th><th>MATRIX: Soil/Solid(S) Water(W) Sediments (SD), Dust(D), Product(P), Biot (B), Bioreid (BS)</th><th colspan="10"></th><th colspan="2">Lab QC (additional bottles req.)</th><th colspan="2">Additional Information (Comment on hazards - e.g., asbestos, known high contamination)</th></tr><tr><th>Lab ID</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></tr></thead><tbody><tr><td>1</td><td>A</td><td></td><td>7/3/24</td><td>2</td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>☐</td><td>☐</td></tr><tr><td>2</td><td>C</td><td></td><td>"</td><td>"</td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>☐</td><td>☐</td></tr><tr><td>3</td><td>D</td><td></td><td>"</td><td>"</td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>☐</td><td>☐</td></tr><tr><td>4</td><td>E</td><td></td><td>"</td><td>"</td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>☐</td><td>☐</td></tr><tr><td>5</td><td>G</td><td></td><td>"</td><td>"</td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>☐</td><td>☐</td></tr><tr><td>6</td><td>H</td><td></td><td>"</td><td>"</td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>☐</td><td>☐</td></tr><tr><td>7</td><td>I</td><td></td><td>"</td><td>"</td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>☐</td><td>☐</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>☐</td><td>☐</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>☐</td><td>☐</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>☐</td><td>☐</td></tr></tbody></table>																ALS Use Only	Sample ID	Depth	Date/Time	No. Bottles	MATRIX: Soil/Solid(S) Water(W) Sediments (SD), Dust(D), Product(P), Biot (B), Bioreid (BS)											Lab QC (additional bottles req.)		Additional Information (Comment on hazards - e.g., asbestos, known high contamination)		Lab ID																		1	A		7/3/24	2		X										☐	☐	2	C		"	"		X										☐	☐	3	D		"	"		X										☐	☐	4	E		"	"		X										☐	☐	5	G		"	"		X										☐	☐	6	H		"	"		X										☐	☐	7	I		"	"		X										☐	☐																	☐	☐																	☐	☐																	☐	☐
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Receipt Detail (Lab Use ONLY)		Chilling Method: Frozen / Melted		Ice: Ice Bricks: Frozen / Thawed		None		Sample Temp at Receipt		°C °C °C		Security Seal Intact (circle)		Yes / No / NA(None)		Carrier Details		☐ Courier/Post		☐ Client		Packaging: (Circle)		Hard Esky		Foam Esky		Box/Bag/Other																																																																																																																																																																																																													
Relinquished by: JAMES HALL-BROWN		Signature: [Signature]		Date/Time: 7/3/24 1325		Received by: [Signature]		Date/Time: 7/3		Signature: 1325																																																																																																																																																																																																																															



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2407780**

Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: NHH SURFACE WATER SAMPLING	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 07-Mar-2024 13:25	Issue Date	: 07-Mar-2024
Client Requested Due Date	: 14-Mar-2024	Scheduled Reporting Date	: 14-Mar-2024

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 20.6°C, 21.5°C, 23.2°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 7 / 7

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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.**



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 - EP008 Chlorophyll a
EB2407780-001	07-Mar-2024 00:00	A	✓
EB2407780-002	07-Mar-2024 00:00	C	✓
EB2407780-003	07-Mar-2024 00:00	D	✓
EB2407780-004	07-Mar-2024 00:00	F	✓
EB2407780-005	07-Mar-2024 00:00	G	✓
EB2407780-006	07-Mar-2024 00:00	H	✓
EB2407780-007	07-Mar-2024 00:00	I	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com



QUALITY CONTROL REPORT

Work Order	: EB2407780	Page	: 1 of 3
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: NHH SURFACE WATER SAMPLING	Date Samples Received	: 07-Mar-2024
Order number	: ----	Date Analysis Commenced	: 07-Mar-2024
C-O-C number	: ----	Issue Date	: 14-Mar-2024
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		



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
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD



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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**



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 Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP008: Chlorophyll (QCLot: 5648736)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	100	95.0	105

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.

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2407780	Page	: 1 of 4
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: NHH SURFACE WATER SAMPLING	Date Samples Received	: 07-Mar-2024
Site	: ----	Issue Date	: 14-Mar-2024
Sampler	: ----	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

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

- **NO** Quality Control Sample Frequency Outliers exist.



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		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a								
White Plastic Bottle - Unpreserved (EP008)		07-Mar-2024	----	----	----	07-Mar-2024	09-Mar-2024	✔
A,	C,							
D,	F,							
G,	H,							
I								



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		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	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
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.



CERTIFICATE OF ANALYSIS

Work Order : **EB2411900**
Client : **LITHAQUA ENVIRONMENTAL SERVICES**
Contact : **MR JAMES HALL-BROWN**
Address :
PEREGIAN BEACH
Telephone : 07 3191 9038
Project : LP140120 - NHH SURFACE WATER
Order number : ----
C-O-C number : ----
Sampler : JAMES HALL-BROWN
Site : ----
Quote number : EN/222
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 10-Apr-2024 09:45
Date Analysis Commenced : 11-Apr-2024
Issue Date : 26-Apr-2024 10:28



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

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.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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.

- EP008 (Chlorophyll a): For particular samples A (EB2411900-001), C (EB2411900-002) & G (EB2411900-005) less volume was filtered due to matrix interference (Suspended Material). LOR adjusted accordingly.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	A	C	D	F	G
Sampling date / time					10-Apr-2024 00:00	10-Apr-2024 00:00	10-Apr-2024 00:00	10-Apr-2024 00:00	10-Apr-2024 00:00
Compound	CAS Number	LOR	Unit		EB2411900-001	EB2411900-002	EB2411900-003	EB2411900-004	EB2411900-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.90	7.06	7.10	6.90	7.27
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		188	289	280	265	325
EA045: Turbidity									
Turbidity	----	0.1	NTU		8.8	7.6	4.1	5.8	35.1
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		<2	<2	2	2	<2
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen - % Saturation	----	0.1	% saturation		27.2	48.0	45.7	22.5	62.2



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	H	I	----	----	----
Sampling date / time					10-Apr-2024 00:00	10-Apr-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2411900-006	EB2411900-007	-----	-----	-----
					Result	Result	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.39	7.47	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		214	14800	----	----	----
EA045: Turbidity									
Turbidity	----	0.1	NTU		32.2	8.4	----	----	----
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		3	2	----	----	----
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen - % Saturation	----	0.1	% saturation		78.1	87.5	----	----	----



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2411900**

Client : **LITHAQUA ENVIRONMENTAL SERVICES**

Contact : **MR JAMES HALL-BROWN**

Address :
PEREGIAN BEACH

E-mail : **james@lithaqua.com**

Telephone : **07 3191 9038**

Facsimile : **----**

Project : **LP140120 - NHH SURFACE WATER**

Order number : **----**

C-O-C number : **----**

Site : **----**

Sampler : **JAMES HALL-BROWN**

Laboratory : **Environmental Division Brisbane**

Contact : **Customer Services EB**

Address :
2 Byth Street Stafford QLD Australia
4053

E-mail : **ALSEnviro.Brisbane@alsglobal.com**

Telephone : **+61-7-3243 7222**

Facsimile : **+61-7-3243 7218**

Page : **1 of 2**

Quote number : **EB2017LITENV0001 (EN/222)**

QC Level : **NEPM 2013 B3 & ALS QC Standard**

Dates

Date Samples Received : **10-Apr-2024 09:45**

Client Requested Due : **17-Apr-2024**

Date

Issue Date : **10-Apr-2024**

Scheduled Reporting Date : **17-Apr-2024**

Delivery Details

Mode of Delivery : **Client Drop Off**

No. of coolers/boxes : **2**

Security Seal : **Not Available**

Temperature : **2.1°C, 3.1°C, 2.8°C - Ice present**

Receipt Detail : **Hard Esky**

No. of samples received / analysed : **7 / 7**

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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.**



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 - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2411900-001	10-Apr-2024 00:00	A	✓	✓	✓	✓	✓
EB2411900-002	10-Apr-2024 00:00	C	✓	✓	✓	✓	✓
EB2411900-003	10-Apr-2024 00:00	D	✓	✓	✓	✓	✓
EB2411900-004	10-Apr-2024 00:00	F	✓	✓	✓	✓	✓
EB2411900-005	10-Apr-2024 00:00	G	✓	✓	✓	✓	✓
EB2411900-006	10-Apr-2024 00:00	H	✓	✓	✓	✓	✓
EB2411900-007	10-Apr-2024 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com



QUALITY CONTROL REPORT

Work Order	: EB2411900	Page	: 1 of 3
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 10-Apr-2024
Order number	: ----	Date Analysis Commenced	: 11-Apr-2024
C-O-C number	: ----	Issue Date	: 26-Apr-2024
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		



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
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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 (%)
EA005P: pH by PC Titrator (QC Lot: 5719477)									
EB2411586-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.61	6.64	0.5	0% - 20%
EB2411642-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.85	7.89	0.5	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5719479)									
EB2411586-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	172	168	2.4	0% - 20%
EB2411642-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	825	826	0.0	0% - 20%
EA045: Turbidity (QC Lot: 5719540)									
EB2411869-004	Anonymous	EA045: Turbidity	----	0.1	NTU	4.5	4.5	0.0	0% - 20%
EB2411900-006	H	EA045: Turbidity	----	0.1	NTU	32.2	32.1	0.3	0% - 20%
EP025: Oxygen - Dissolved (DO) (QC Lot: 5718084)									
EB2411900-001	A	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	27.2	27.0	0.8	0% - 20%
EB2411911-001	Anonymous	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	80.0	80.0	0.0	0% - 20%



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**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA005P: pH by PC Titrator (QCLot: 5719477)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.8	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5719479)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	97.2	90.0	106
				<1	24800 µS/cm	99.0	90.0	106
EA045: Turbidity (QCLot: 5719540)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	101	90.0	110
				<0.1	40 NTU	99.8	90.0	110
				<0.1	400 NTU	97.8	90.0	110
EP008: Chlorophyll (QCLot: 5719380)								
EP008: Chlorophyll a	----	1	mg/m³	<1	23 mg/m³	95.4	95.0	105

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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2411900	Page	: 1 of 5
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 10-Apr-2024
Site	: ----	Issue Date	: 26-Apr-2024
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

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

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

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Analysis Holding Time Compliance

Matrix: WATER

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural							
A,	C,	----	----	----	15-Apr-2024	11-Apr-2024	4
D,	F,						
G,	H,						
I							

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			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA005P: pH by PC Titrator									
Clear Plastic Bottle - Natural (EA005-P) A, D, G, I		C, F, H,	10-Apr-2024	----	----	----	15-Apr-2024	11-Apr-2024	✖
EA010P: Conductivity by PC Titrator									
Clear Plastic Bottle - Natural (EA010-P) A, D, G, I		C, F, H,	10-Apr-2024	----	----	----	15-Apr-2024	08-May-2024	✔
EA045: Turbidity									
Clear Plastic Bottle - Natural (EA045) A, D, G, I		C, F, H,	10-Apr-2024	----	----	----	11-Apr-2024	12-Apr-2024	✔

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a								
Opaque Plastic Bottle - Unpreserved (EP008)		10-Apr-2024	----	----	----	11-Apr-2024	12-Apr-2024	✓
A,	C,							
D,	F,							
G,	H,							
I								
EP025: Oxygen - Dissolved (DO)								
Clear Plastic Bottle - Natural (EP025)		10-Apr-2024	----	----	----	11-Apr-2024	11-Apr-2024	✓
A,	C,							
D,	F,							
G,	H,							
I								



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		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	2	17	11.76	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Oxygen - Dissolved	EP025	2	13	15.38	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	19	10.53	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	17	11.76	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	19	10.53	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	20	15.00	15.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)



CERTIFICATE OF ANALYSIS

Work Order : **EB2414852**
Client : **LITHAQUA ENVIRONMENTAL SERVICES**
Contact : **MR JAMES HALL-BROWN**
Address :
PEREGIAN BEACH
Telephone : 07 3191 9038
Project : LP140120 - NHH SURFACE WATER
Order number : ----
C-O-C number : ----
Sampler : JAMES HALL-BROWN
Site : NHH
Quote number : EN/222
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 03-May-2024 14:05
Date Analysis Commenced : 03-May-2024
Issue Date : 12-Jun-2024 11:33



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

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.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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. are fully validated and are often at the client request.

In house developed procedures

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.



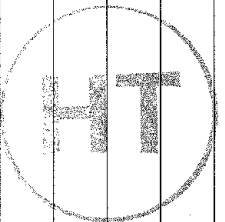
Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	A	C	D	F	G
Sampling date / time					03-May-2024 00:00	03-May-2024 00:00	03-May-2024 00:00	03-May-2024 00:00	03-May-2024 00:00
Compound	CAS Number	LOR	Unit		EB2414852-001	EB2414852-002	EB2414852-003	EB2414852-004	EB2414852-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.87	7.46	7.16	6.87	7.53
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		239	1800	429	325	19100
EA045: Turbidity									
Turbidity	----	0.1	NTU		4.0	5.6	4.9	1.8	7.1
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		2	2	<1	2	1
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen - % Saturation	----	0.1	% saturation		43.8	85.1	63.6	39.8	74.2



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	H	I	----	----	----
Sampling date / time					03-May-2024 00:00	03-May-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2414852-006	EB2414852-007	-----	-----	-----
				Result	Result		----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.68	7.37	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		446	33800	----	----	----
EA045: Turbidity									
Turbidity	----	0.1	NTU		7.4	12.3	----	----	----
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		2	2	----	----	----
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen - % Saturation	----	0.1	% saturation		71.5	83.1	----	----	----

Mandatory Fields				CHAIN OF CUSTODY												Page 1 of 1											
CLIENT CODE: LITENV				*PROJECT MANAGER:				SAMPLER: JAMES HALL-BROWN										CoC #: (if applicable)									
*CLIENT: LITHAQUA				*PM MOBILE:				SAMPLER MOBILE: 0601 671 624																			
OFFICE: PERCECIAN BEACH				ALS QUOTE # (Client PL if blank)				PURCHASE ORDER NO.:																			
PROJECT NO./PROJECT: NHH SURFACES WATER LP140120								SITE: NHH																			
*INVOICE TO: (client default if nil) james@lithaqua.com								☐ CC Invoice to PM										BIOSECURITY									
*EMAIL REPORTS TO: (default to PM if blank)								*ANALYSIS REQUIRED (NB. ALS Quote No. and/or Analysis Suite Codes must be listed to attract sube/quoted price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). Mark an X in the boxes below analysis to indicate the parameter listed above to be tested on that sample.										Country of Origin: (if not Australia)									
*STORAGE REQUIREMENTS Please check box. → Standard Storage time from receipt of samples: Waters - 3 weeks Soils - 2 months				☒ Standard Storage ☐ Extended Storage Specify Disposal Date: Note: Extended storage incurs a fee and requires a signed agreement.				*TURNAROUND Please check box. → 5+ days (no surcharge) 3 day (+15%) 2 day (+30%) 1 day (+50%) (Not all tests can be expedited, contact Client Services for more information)														Environmental Division Brisbane Work Order Reference EB2414852					
Comments:																											
																		Telephone : + 61-7-3243 7222									
ALS Use Only		Sample ID		Depth		Date/Time		No. Bottles		MATRIX: Soil/Solid(S), Water(W), Sediments (SD), Dust(D), Product(P), Biota (B), Biosolid (BS)		PH		EC		DO (1 only)		TURBIDITY		CHLOROPHYLL A		Lab QC (additional bottles req.)		Additional Information (Comment on hazards - e.g., asbestos, known high contamination)			
Lab ID																						Dup		MS			
1		A				3/5/24		2				X		X		X		X		X		☐		☐			
2		C				"		2				X		X		X		X		X		☐		☐			
3		D				"		1				X		X		X		X		X		☐		☐			
4		E				"		1				X		X		X		X		X		☐		☐			
5		G				"		1				X		X		X		X		X		☐		☐			
6		H				"		1				X		X		X		X		X		☐		☐			
7		I				"		1				X		X		X		X		X		☐		☐			
																						☐		☐			
																						☐		☐			
																						☐		☐			
																						☐		☐			
Receipt Detail (Lab Use ONLY)		Chilling Method: Ice: Frozen / Melted		Ice Bricks: Frozen / Thawed		None		Sample Temp at Receipt		°C °C °C		Security Seal Intact (circle)		Yes / No / NA(None)		Carrier Details		☐ Courier/Post ☐ Client		Packaging: (Circle)		Hard Esky		Foam Esky		Box/Bag/Other	
																		Con Note #		Count		#		#		#	
Relinquished by:				Signature:				Date/Time:				Received by: ED 03105				Signature: 1405				Date/Time:							
Relinquished by:				Signature:				Date/Time:				Received by:				Signature:				Date/Time:							



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2414852**

Client : **LITHAQUA ENVIRONMENTAL SERVICES**

Contact : **MR JAMES HALL-BROWN**

Address :
PEREGIAN BEACH

E-mail : **james@lithaqua.com**

Telephone : **07 3191 9038**

Facsimile : **----**

Project : **LP140120 - NHH SURFACE WATER**

Order number : **----**

C-O-C number : **----**

Site : **NHH**

Sampler : **JAMES HALL-BROWN**

Laboratory : **Environmental Division Brisbane**

Contact : **Customer Services EB**

Address :
2 Byth Street Stafford QLD Australia 4053

E-mail : **ALSEnviro.Brisbane@alsglobal.com**

Telephone : **+61-7-3243 7222**

Facsimile : **+61-7-3243 7218**

Page : **1 of 2**

Quote number : **EB2017LITENV0001 (EN/222)**

QC Level : **NEPM 2013 B3 & ALS QC Standard**

Dates

Date Samples Received : **03-May-2024 14:05**

Client Requested Due : **13-May-2024**

Date

Issue Date : **03-May-2024**

Scheduled Reporting Date : **13-May-2024**

Delivery Details

Mode of Delivery : **Client Drop Off**

No. of coolers/boxes : **1**

Security Seal : **Not Available**

Temperature : **18.8°C, 18.9°C, 14.0°C - Ice present**

Receipt Detail : **HARD ESKY**

No. of samples received / analysed : **7 / 7**

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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.**



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 - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2414852-001	03-May-2024 00:00	A	✓	✓	✓	✓	✓
EB2414852-002	03-May-2024 00:00	C	✓	✓	✓	✓	✓
EB2414852-003	03-May-2024 00:00	D	✓	✓	✓	✓	✓
EB2414852-004	03-May-2024 00:00	F	✓	✓	✓	✓	✓
EB2414852-005	03-May-2024 00:00	G	✓	✓	✓	✓	✓
EB2414852-006	03-May-2024 00:00	H	✓	✓	✓	✓	✓
EB2414852-007	03-May-2024 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com



QUALITY CONTROL REPORT

Work Order	: EB2414852	Page	: 1 of 3
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 03-May-2024
Order number	: ----	Date Analysis Commenced	: 03-May-2024
C-O-C number	: ----	Issue Date	: 12-Jun-2024
Sampler	: JAMES HALL-BROWN		
Site	: NHH		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		



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
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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 (%)
EA005P: pH by PC Titrator (QC Lot: 5767687)									
EB2414852-003	D	EA005-P: pH Value	----	0.01	pH Unit	7.16	7.20	0.6	0% - 20%
EB2414628-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.11	8.04	0.9	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5767700)									
EB2414853-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	3.41	3.41	0.0	0% - 20%
EB2414853-012	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	3.30	3.29	0.3	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5767701)									
EB2414852-001	A	EA005-P: pH Value	----	0.01	pH Unit	6.87	6.86	0.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5767688)									
EB2414852-003	D	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	429	427	0.4	0% - 20%
EB2414628-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1670	1660	0.9	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5767698)									
EB2414853-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	7880	7960	0.9	0% - 20%
EB2414853-012	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	7650	7820	2.2	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5767699)									
EB2414852-001	A	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	239	237	0.7	0% - 20%
EA045: Turbidity (QC Lot: 5767200)									
EB2414462-001	Anonymous	EA045: Turbidity	----	0.1	NTU	0.4	0.4	0.0	No Limit
EP025: Oxygen - Dissolved (DO) (QC Lot: 5767199)									
EB2414462-001	Anonymous	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	94.8	94.8	0.0	0% - 20%



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**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA005P: pH by PC Titrator (QCLot: 5767687)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.8	98.0	102
				----	7 pH Unit	100	98.0	102
EA005P: pH by PC Titrator (QCLot: 5767700)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.8	98.0	102
				----	7 pH Unit	100	98.0	102
EA005P: pH by PC Titrator (QCLot: 5767701)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5767688)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	98.0	90.0	106
				<1	12890 µS/cm	97.1	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5767698)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	95.3	90.0	106
				<1	24800 µS/cm	97.3	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5767699)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	99.0	90.0	106
				<1	24800 µS/cm	102	90.0	106
EA045: Turbidity (QCLot: 5767200)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.0	90.0	110
				<0.1	40 NTU	101	90.0	110
				<0.1	400 NTU	97.5	90.0	110
EP008: Chlorophyll (QCLot: 5768021)								
EP008: Chlorophyll a	----	1	mg/m³	<1	21 mg/m³	99.3	95.0	105

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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2414852	Page	: 1 of 5
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 03-May-2024
Site	: NHH	Issue Date	: 12-Jun-2024
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

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, where applicable to the methodology, **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

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Analysis Holding Time Compliance

Matrix: WATER

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural							
A,	C,	----	----	----	04-May-2024	03-May-2024	1
D,	F,						
G,	H,						
I							

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			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P) A, D, G, I	C, F, H,	03-May-2024	----	----	----	04-May-2024	03-May-2024	✖
EA010P: Conductivity by PC Titrator								
Clear Plastic Bottle - Natural (EA010-P) A, D, G, I	C, F, H,	03-May-2024	----	----	----	04-May-2024	31-May-2024	✔
EA045: Turbidity								
Clear Plastic Bottle - Natural (EA045) A, D, G, I	C, F, H,	03-May-2024	----	----	----	03-May-2024	05-May-2024	✔

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a								
White Plastic Bottle - Unpreserved (EP008)		03-May-2024	----	----	----	03-May-2024	05-May-2024	✓
A,	C,							
D,	F,							
G,	H,							
I								
EP025: Oxygen - Dissolved (DO)								
Clear Plastic Bottle - Natural (EP025)		03-May-2024	----	----	----	03-May-2024	03-May-2024	✓
A,	C,							
D,	F,							
G,	H,							
I								



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		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	5	34	14.71	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Oxygen - Dissolved	EP025	1	7	14.29	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	5	40	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	9	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	6	34	17.65	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	6	40	15.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	9	33.33	15.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	3	34	8.82	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	9	11.11	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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)



CERTIFICATE OF ANALYSIS

Work Order : **EB2419283**
Client : **LITHAQUA ENVIRONMENTAL SERVICES**
Contact : **MR JAMES HALL-BROWN**
Address :
PEREGIAN BEACH
Telephone : 07 3191 9038
Project : LP140120 - NHH SURFACE WATER
Order number : ----
C-O-C number : ----
Sampler : JAMES HALL-BROWN
Site : NHH
Quote number : EN/222
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 06-Jun-2024 11:24
Date Analysis Commenced : 06-Jun-2024
Issue Date : 12-Jun-2024 11:33



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

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.

Signatories	Position	Accreditation Category
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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. are fully validated and are often at the client request.

In house developed procedures

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.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	A	C	D	F	G
Sampling date / time					06-Jun-2024 00:00	06-Jun-2024 00:00	06-Jun-2024 00:00	06-Jun-2024 00:00	06-Jun-2024 00:00
Compound	CAS Number	LOR	Unit		EB2419283-001	EB2419283-002	EB2419283-003	EB2419283-004	EB2419283-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.82	7.55	7.39	7.26	7.65
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		226	8370	1390	310	34800
EA045: Turbidity									
Turbidity	----	0.1	NTU		3.4	3.0	3.0	13.9	5.3
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		4	2	1	40	7
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen	----	0.1	mg/L		4.6	8.3	6.8	4.3	7.5
Dissolved Oxygen - % Saturation	----	0.1	% saturation		52.3	92.2	74.1	47.0	84.2



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	H	I	----	----	----
Sampling date / time					06-Jun-2024 00:00	06-Jun-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2419283-006	EB2419283-007	-----	-----	-----
				Result	Result		----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.61	7.90	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		3230	46600	----	----	----
EA045: Turbidity									
Turbidity	----	0.1	NTU		9.9	1.8	----	----	----
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		13	2	----	----	----
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen	----	0.1	mg/L		6.5	8.3	----	----	----
Dissolved Oxygen - % Saturation	----	0.1	% saturation		72.6	93.5	----	----	----

Mandatory Fields				CHAIN OF CUSTODY												Page <u>1</u> of <u>1</u>																																																																																																																																																																																
CLIENT CODE: <u>LITENV</u>				*PROJECT MANAGER: <u>JAMES HALL-BROWN</u>				SAMPLER: <u>JAMES HALL-BROWN</u>				CoC #: (if applicable)		Environmental Division Brisbane Work Order Reference EB2419283  Telephone : + 61-7-3243 7222																																																																																																																																																																																		
*CLIENT: <u>LITMAQUA</u>				*PM MOBILE: <u>0401671624</u>				SAMPLER MOBILE:																																																																																																																																																																																								
OFFICE: (Invoiced Office) <u>PEROGIAN BEACH</u>				ALS QUOTE #: (Client PL if blank)				PURCHASE ORDER NO.:																																																																																																																																																																																								
PROJECT NO./PROJECT: <u>NHH SURFACE WATER</u> <u>LP140120</u>								SITE: <u>NHH</u>																																																																																																																																																																																								
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*EMAIL REPORTS TO: (default to PM if blank)														*ANALYSIS REQUIRED (Nil ALS Quote No, and/or Analysis Suite Codes must be listed to attract suite/quoted price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). Mark an X in the boxes below analysis to indicate the parameter listed above to be tested on that sample.		Country of Origin: (if not Australia)																																																																																																																																																																																
* STORAGE REQUIREMENTS Please check box. ☒ Standard Storage ☐ Extended Storage Standard Storage time from receipt of samples: Waters - 3 weeks Soils - 2 months Note: Extended storage incurs a fee and requires a signed agreement.				* TURNAROUND Please check box. ☒ 5+ days (no surcharge) ☐ 3 day (+15%) ☐ 2 day (+30%) ☐ 1 day (+50%) (Not all tests can be expedited, contact Client Services for more information)				PH EC DO (1 only) TURBIDITY CALCOPHYLL-A																																																																																																																																																																																								
Comments:				MATRIX: Solid(S) Water(W) Sediments (SD), Dust(D), Product (P), Bacteria (B), Biosolids (BS)																																																																																																																																																																																												
<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">ALS Use Only Lab ID</th> <th rowspan="2">Sample ID</th> <th rowspan="2">Depth</th> <th rowspan="2">Date/Time</th> <th rowspan="2">No. Bottles</th> <th rowspan="2">MATRIX: Solid(S) Water(W) Sediments (SD), Dust(D), Product (P), Bacteria (B), Biosolids (BS)</th> <th colspan="5"></th> <th colspan="2">Lab QC (additional bottles req.)</th> <th rowspan="2">Additional Information (Comment on hazards - e.g., asbestos, known high contamination)</th> </tr> <tr> <th>PH</th> <th>EC</th> <th>DO</th> <th>TURB</th> <th>CALC</th> <th>Dup</th> <th>M5</th> </tr> </thead> <tbody> <tr><td>1</td><td>A</td><td></td><td>6/6/24</td><td>2</td><td></td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>C</td><td></td><td>"</td><td>"</td><td></td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>D</td><td></td><td>"</td><td>"</td><td></td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>E</td><td></td><td>"</td><td>"</td><td></td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>5</td><td>G</td><td></td><td>"</td><td>"</td><td></td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>6</td><td>H</td><td></td><td>"</td><td>"</td><td></td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>7</td><td>I</td><td></td><td>"</td><td>"</td><td></td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>																		ALS Use Only Lab ID	Sample ID	Depth	Date/Time	No. Bottles	MATRIX: Solid(S) Water(W) Sediments (SD), Dust(D), Product (P), Bacteria (B), Biosolids (BS)						Lab QC (additional bottles req.)		Additional Information (Comment on hazards - e.g., asbestos, known high contamination)	PH	EC	DO	TURB	CALC	Dup	M5	1	A		6/6/24	2		X	X	X	X	X				2	C		"	"		X	X	X	X	X				3	D		"	"		X	X	X	X	X				4	E		"	"		X	X	X	X	X				5	G		"	"		X	X	X	X	X				6	H		"	"		X	X	X	X	X				7	I		"	"		X	X	X	X	X																																																											
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Receipt Detail (Lab Use ONLY)		Chilling Method: Ice: Frozen / Melted Ice Bricks: Frozen / Thawed None			Sample Temp at Receipt: °C °C °C			Security Seal Intact (circle) Yes / No / NA(Nonex)			Carrier Details: ☐ Courier/Post ☐ Client			Packaging: (Circle) Hard Esly Foam Esly Box/Bag/Other																																																																																																																																																																																		
Relinquished by: <u>J Hall Brown</u>		Signature: <u>[Signature]</u>			Date/Time: <u>6/6/24</u>			Received by: <u>[Signature]</u>			Date/Time: <u>6/6/24</u>			Signature: _____																																																																																																																																																																																		
Relinquished by: _____		Signature: _____			Date/Time: _____			Received by: _____			Date/Time: _____			Signature: _____																																																																																																																																																																																		



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2419283**

Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LP140120 - NHH SURFACE WATER	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: NHH		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 06-Jun-2024 11:24	Issue Date	: 06-Jun-2024
Client Requested Due Date	: 13-Jun-2024	Scheduled Reporting Date	: 13-Jun-2024

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 1.5, 1.6, 1.3°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 7 / 7

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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.**



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 - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2419283-001	06-Jun-2024 00:00	A	✓	✓	✓	✓	✓
EB2419283-002	06-Jun-2024 00:00	C	✓	✓	✓	✓	✓
EB2419283-003	06-Jun-2024 00:00	D	✓	✓	✓	✓	✓
EB2419283-004	06-Jun-2024 00:00	F	✓	✓	✓	✓	✓
EB2419283-005	06-Jun-2024 00:00	G	✓	✓	✓	✓	✓
EB2419283-006	06-Jun-2024 00:00	H	✓	✓	✓	✓	✓
EB2419283-007	06-Jun-2024 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com



QUALITY CONTROL REPORT

Work Order	: EB2419283	Page	: 1 of 3
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 06-Jun-2024
Order number	: ----	Date Analysis Commenced	: 06-Jun-2024
C-O-C number	: ----	Issue Date	: 12-Jun-2024
Sampler	: JAMES HALL-BROWN		
Site	: NHH		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		



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
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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 (%)
EA005P: pH by PC Titrator (QC Lot: 5840888)									
EB2418201-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.73	8.80	0.8	0% - 20%
EB2419283-005	G	EA005-P: pH Value	----	0.01	pH Unit	7.65	7.68	0.4	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5840889)									
EB2418201-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	731	714	2.3	0% - 20%
EB2419283-005	G	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	34800	34500	0.9	0% - 20%
EA045: Turbidity (QC Lot: 5840842)									
EB2418994-001	Anonymous	EA045: Turbidity	----	0.1	NTU	69.6	69.6	0.0	0% - 20%
EB2419279-002	Anonymous	EA045: Turbidity	----	0.1	NTU	0.4	0.4	0.0	No Limit
EP025: Oxygen - Dissolved (DO) (QC Lot: 5840223)									
EB2417820-003	Anonymous	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	136	136	0.1	0% - 20%
		EP025: Dissolved Oxygen	----	0.1	mg/L	11.5	11.5	0.0	0% - 20%



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**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound		CAS Number	LOR		Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low
EA005P: pH by PC Titrator (QCLot: 5840888)									
EA005-P: pH Value		----	----	pH Unit	----	4 pH Unit	100	98.0	102
					----	7 pH Unit	99.8	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5840889)									
EA010-P: Electrical Conductivity @ 25°C		----	1	µS/cm	<1	220 µS/cm	93.7	90.0	106
					<1	12890 µS/cm	98.2	90.0	106
EA045: Turbidity (QCLot: 5840842)									
EA045: Turbidity		----	0.1	NTU	<0.1	4 NTU	100	90.0	110
					<0.1	40 NTU	101	90.0	110
					<0.1	400 NTU	100	90.0	110
EP008: Chlorophyll (QCLot: 5840529)									
EP008: Chlorophyll a		----	1	mg/m³	<1	21 mg/m³	100	95.0	105

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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2419283	Page	: 1 of 5
Client	: LITHAQUA ENVIRONMENTAL SERVICES	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 06-Jun-2024
Site	: NHH	Issue Date	: 12-Jun-2024
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

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, where applicable to the methodology, **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

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Analysis Holding Time Compliance

Matrix: WATER

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural							
A,	C,	----	----	----	10-Jun-2024	06-Jun-2024	4
D,	F,						
G,	H,						
I							

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			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P) A, D, G, I	C, F, H,	06-Jun-2024	----	----	----	10-Jun-2024	06-Jun-2024	✖
EA010P: Conductivity by PC Titrator								
Clear Plastic Bottle - Natural (EA010-P) A, D, G, I	C, F, H,	06-Jun-2024	----	----	----	10-Jun-2024	04-Jul-2024	✔
EA045: Turbidity								
Clear Plastic Bottle - Natural (EA045) A, D, G, I	C, F, H,	06-Jun-2024	----	----	----	06-Jun-2024	08-Jun-2024	✔

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a								
White Plastic Bottle - Unpreserved (EP008)		06-Jun-2024	----	----	----	06-Jun-2024	08-Jun-2024	✓
A,	C,							
D,	F,							
G,	H,							
I								
EP025: Oxygen - Dissolved (DO)								
Clear Plastic Bottle - Natural (EP025)		06-Jun-2024	----	----	----	06-Jun-2024	06-Jun-2024	✓
A,	C,							
D,	F,							
G,	H,							
I								



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		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Oxygen - Dissolved	EP025	1	8	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	12	16.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	12	16.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	20	15.00	15.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)