2023 Compliance Report

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

North Harbour
feel right at home

Document Version Control

VERSION	PREPARED BY	REVIEWED BY	DATE
1.0	M. McErlean	B. Finney M. Hall-Brown	03/08/23

Table of Contents

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.

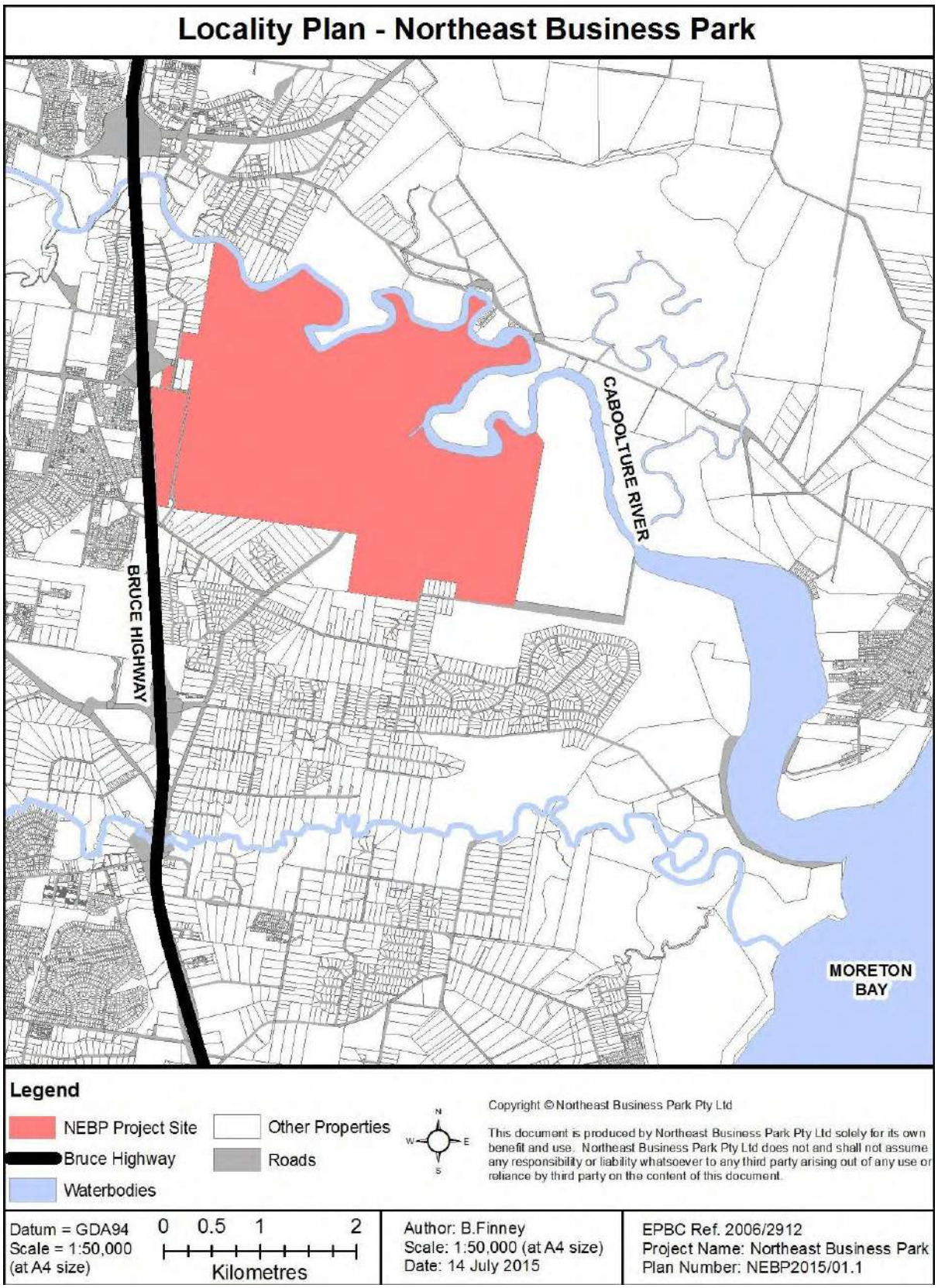
This document is the nineth compliance report, relating to activities undertaken from 13 May 2022 to 12 May 2023. Please note that during the preparation period of this report, subsequent approvals have been acquired. Reporting associated with these approvals and works undertaken after 12 May 2023 will be provided in the 2024 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 2022 – 12 May 2023
Report Preparation:	June to August 2023

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

Figure 1


Locality Plan - Northeast Business Park
CABOOLTURE RIVER
BRUCE HIGHWAY
MORETON BAY
Legend
NEBP Project Site
Other Properties
Bruce Highway
Roads
Waterbodies
N
W
E
S
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Author: B.Finney
Scale: 1:50,000 (at A4 size)
Date: 14 July 2015
EPBC Ref. 2006/2912
Project Name: Northeast Business Park
Plan Number: NEBP2015/01.1

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 ongoing at 12 May 2023 (closing date for the 2023 compliance reporting period). These works are expected to be undertaken progressively over the coming year.

Activities undertaken under the LBEMP & sub-plan 5

Sub-plan 5 (approved 3 April 2018) defined the approved works program for;

- Civil construction of the ultimate North East Business Park Sewer Connection. These Subplan 5 works were commenced and completed in the 2018 - 2019 reporting period. 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 2023 (closing date for the 2023 compliance reporting period). These works are expected to be undertaken progressively over the coming years.

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 ongoing at 12 May 2023 (closing date for the 2023 compliance reporting period). These works are expected to be completed later in 2023.

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 within existing replanted areas. Additional planting was undertaken October 2021 within the riparian corridor. 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 2022 - 2023 reporting period, with this report providing information on operations conducted during the nineth 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 _____/_____/_____

APPENDICES

APPENDIX A: 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 by 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 2022 compliance report was uploaded to the NEBP website 12 August 2022, 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.

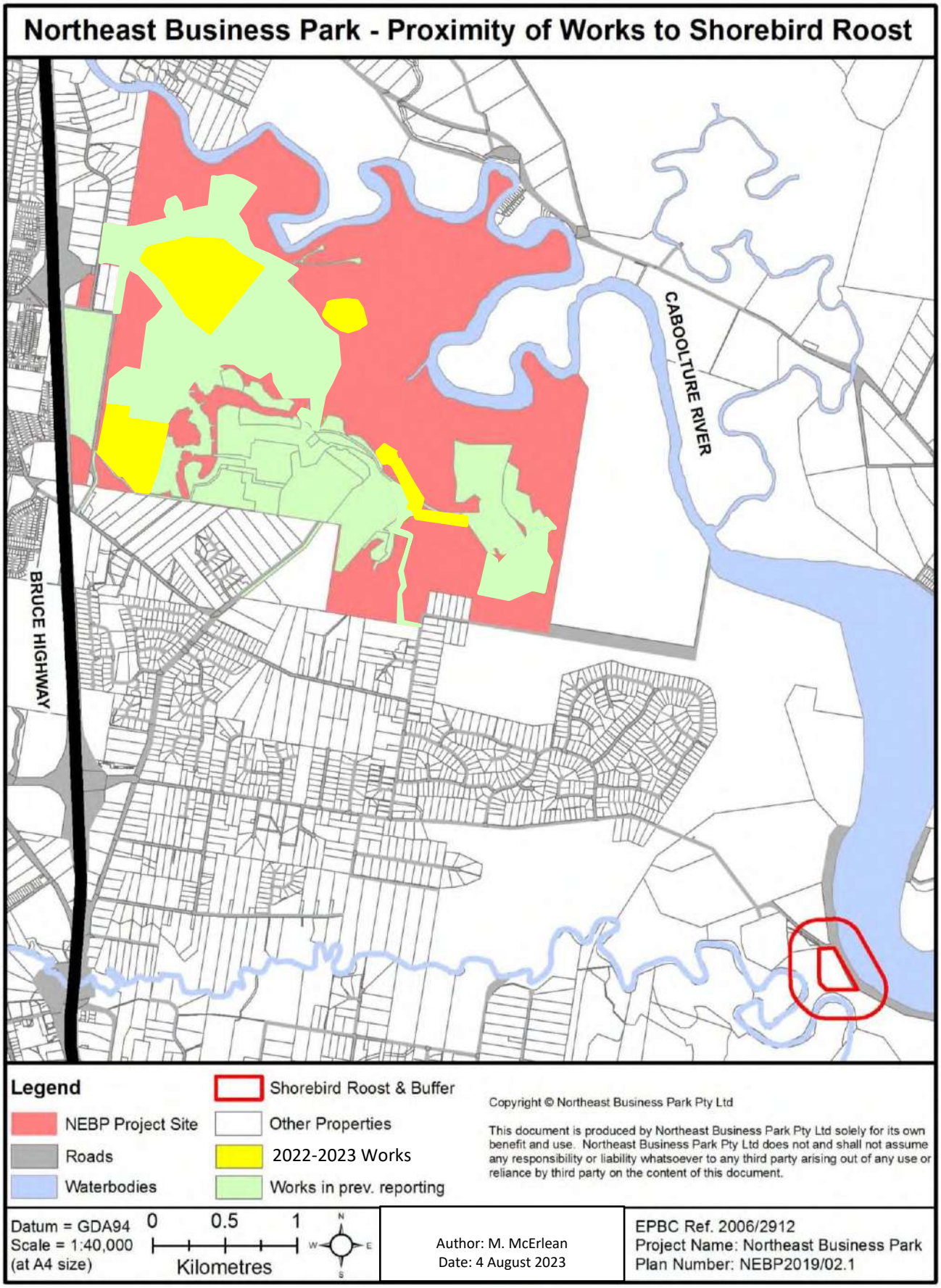
	criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.		
5	If the person taking the action wishes to carry out any activity otherwise than in accordance with the management plan/s as specified in the conditions, the person taking 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 and 2022 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 specied (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 No clearance of native vegetation undertaken in the 2022/2023 reporting period.
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. 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	Compliant	No clearance of native vegetation undertaken in the 2022/2023 reporting period.

	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.		
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	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

	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 artivicial bank protection structures; ii. Identify corrective actions or alternative options that will be implemented if unexpected adverse impacts on marine and shorebird specied 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 changed 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 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		CREMP to be undertaken at a future date, prior to works impacting the Caboolture River.

	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.		


Northeast Business Park - Proximity of Works to Shorebird Roost
CABOOLTURE RIVER
BRUCE HIGHWAY
Legend
NEBP Project Site
Roads
Waterbodies
Shorebird Roost & Buffer
Other Properties
2022-2023 Works
Works in prev. reporting
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Author: M. McErlean
Date: 4 August 2023
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 2022, 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	Fauna Spotter-Catcher supervision provided by Australia Wide Environmental Consultants, as required. Qualification and contact details can be provided upon request by DCCEEW .
Subplan 4 Section 6 Point 5	The dates and locations of all vegetation clearance works	Compliant	During the reporting period, vegetation clearance works were undertaken as per the pre and post-disturbance fauna report and attached at appendix D

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	Copy of reports by Australia Wide Environmental Consultants provided following clearing and attached at appendix D.
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	No vegetation clearance works were undertaken during this reporting period.
Subplan 6 Section 6 Point 5	The dates and locations of all vegetation clearance works.	Not Applicable	No vegetation clearance works were undertaken during this reporting period.
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	No vegetation clearance works were undertaken during this reporting period.
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 McArther); • 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	Fauna Spotter-Catcher supervision provided by Australia Wide Environmental Consultants (Joel Keady) as required. Qualification and contact details can be provided upon request by DCCEEW.
Subplan 7 Section 6 Point 5	The dates and locations of all vegetation clearance works.	Compliant	During the reporting period, vegetation clearance works were undertaken as per the pre and post-disturbance fauna report and attached at appendix D
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	Copy of reports by Australia Wide Environmental Consultants provided following clearing and attached at appendix D.

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
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 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 2022-2023 reporting period (All works previously completed). Refer 2014 – 2015 Compliance Report.

LBEMP Sub-Plan 2

Not applicable for 2022-2023 reporting period (All works previously completed). Refer 2014 – 2015 and 2015 – 2016 Compliance Reports.

LBEMP Sub-Plan 3

Not applicable for 2022-2023 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

- Note: Register Current as at 12 May 2023
- 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 2022-2023 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

- Note: Register Current as at 12 May 2023Other 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: Friday, 12 August 2022 3:50 PM
To: 'EPBCMonitoring@environment.gov.au'
Cc: Bryan Finney
Subject: RE: 2006-2912 Northeast Business Park 2022 Compliance Report

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/2022/08/2022-Northeast-Business-Park-COMPLIANCE-REPORT-2006-2912_v1.0-FINAL.pdf

Regards,
Michael McErlean
Planning & Approvals Manager

North Harbour
feel right at home

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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VIRUSES: Our system is equipped with the most up-to-date virus scanners. However, no warranty is made that this material is free from computer defect or other defects. Any loss/damage incurred by using this material is not our responsibility. North Harbour Holdings' entire liability will be limited to re-supplying the material.

Michael McErlean

From: Warren Griffiths <Warren.Griffiths@awe.gov.au>
Sent: Tuesday, 14 February 2023 1:26 PM
To: Michael McErlean
Subject: 2006-2912 Northeast Business Park - 2022 Annual Compliance Report - Receipt [SEC=OFFICIAL]

Dear Michael,

Thank you for the submission of the 2022 Annual Compliance Report for **EPBC 2006/2912**. The Department acknowledges that you have met your reporting requirements under **condition 3**, and this has been noted in our records.

Please note that your next Annual Compliance Report is due on **12 August 2023**.

For any further questions please contact the Compliance Monitoring Team at epbcmonitoring@dcceew.gov.au.

Regards,

Warren Griffiths

Environment Audit Section | Environment Compliance Branch | Chief Counsel Division
Department of Climate Change, Energy, the Environment and Water
Ngunnawal Country, John Gorton Building, King Edward Terrace, Parks ACT (GPO Box 3090) Australia
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 First Nations 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

13 June 2023 Project No. 19210-026-Rev0

Mr Michael McErlean
North East Business Park Pty Ltd

Email: michael@northharbour.com.au

ENVIRONMENTAL MONITORING SUMMARY – MAY 2022 TO MAY 2023
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 2022 to May 2023 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 are 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).

2.0 SUMMARY OF SITE DEVELOPMENT

Works undertaken during the reporting period (May 2022 to May 2023) include 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: Completion of Phase 4B(3) between June 2022 to May 2022.
  - Approximately 15,150 m³ of cut and fill earthworks involving non-ASS material.
- Civil Construction: Completion of Stages 29 to 32 and commencement of Stages 39 and 40.

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 do not require specific soil treatment or groundwater monitoring as part of the ongoing development.

North Harbour Mixed Industry and Business Area (MIBA)

- General Bulk Earthworks – June 2022 to May 2023.
  - Approximately 1,135,800 m³ of cut to fill from non-ASS zones.
  - Excavation and treatment of approximately 19,700 m³ of soil containing actual ASS from Wetland 4.
  - Excavation and treatment of approximately 700 m³ of soil containing actual and potential ASS from the Raff Creek Bridge and culvert trimming works (re-commenced May 2023).

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 have been prepared and previously submitted to the administering authority.

Table 1: Sequence of Bulk Earthworks and Civil Construction

Area	Residential West								MIBA			
Period/Phase	Bulk Earthwork Phase			Civil Construction Stage					Bulk Earthworks			
Stage No. Works Area	1, 2 & 3	4(1) & 4(2)	4(3)	1-24 & 34-36	37 & 42-45	25-28,38	29-32, 39-40	33 & 41	Wetlands 1, 2 & 3	Raff Creek Bridge	Wetland 4	General Bulk Earthworks (Non-ASS & ANS Zones)
Pre-2020	■			■								
2020/2021		■			■				■			
2021/2022			■			■			■	■		■
2022/2023			■				■			■	■	■
Future Works								■				■

3.0 GROUNDWATER MONITORING

Bulk earthworks for *Residential West* Phase 4(3) required no soil treatment or groundwater monitoring between May 2022 and May 2023.

Bulk earthworks for the *MIBA* commenced at the start of March 2021 and are ongoing. Groundwater monitoring associated with identified ASS zones within the *MIBA* development has been 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. Several works areas (i.e. Wetland 1, 2, 3, 4 & Northern Drainage Corridor) have been completed with associated post-construction monitoring being carried out at designated groundwater monitoring locations. Construction monitoring is ongoing, specific to remaining earthworks (i.e. Raff Creek works).

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 (May 2022 to May 2023)

Report No.	Monthly Period	Works Package & Monitoring Phase
19210-016 (Tectonic)	May & June 2022	MIBA - Construction Monitoring
19210-017 (Tectonic)	July 2022	MIBA - Construction Monitoring
19210-018 (Tectonic)	August 2022	MIBA - Construction Monitoring
19210-019 (Tectonic)	September 2022	MIBA - Construction Monitoring
19210-020 (Tectonic)	October 2022	MIBA - Construction Monitoring
19210-021 (Tectonic)	November 2022	MIBA - Construction Monitoring
19210-022 (Tectonic)	December 2022 & January 2023	MIBA - Construction & Post-construction Monitoring
19210-023 (Tectonic)	February 2023	MIBA - Construction & Post-construction Monitoring
19210-024 (Tectonic)	March 2023	MIBA - Construction & Post-construction Monitoring
19210-025 (Tectonic)	April 2023	MIBA - Construction & Post-construction Monitoring
19210-027 (Tectonic)	May 2023	MIBA - Construction & 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 the 20th and 80th percentile baseline values were exceeded, 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 were not an appropriate method of assessing results (e.g. chloride:sulfate ratio).

Over the course of monitoring undertaken, groundwater conditions are not considered to have 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* (i.e. Wetland 2, Wetland 3, Northern Drainage Corridor and Raff Creek Bridge Abutment) 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, Morrison Geotechnic Pty Ltd (Morrison) and Qualtest Laboratory Pty Ltd (Qualtest).

A summary of ASS verification testing completed between May 2022 and May 2023 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
Wetland 4	19,700 m^3	43	3
Raff Creek Bridge	700 m^3	N/A	N/A

Note: N/A – Not available at time of reporting. Trimming earthworks at Raff Creek Bridge commenced in mid-May 2023. While these materials are understood to have been treated and sampled for verification purposes, results were not available at the time of reporting.

It is noted that the volumes of testing completed generally correspond to the bulk earthworks volume estimates provided by Hall at the prescribed rate of 1 test per 500 m^3. All testing completed generally 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. This fact is also supported by lime use records for the site which indicate that adequate volumes of lime have been used based on the excavation volumes carried out.

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

4.1 Lime Delivery Records

Lime delivery records provided by Hall indicate a total of 876 tonne of agricultural lime has been delivered to the North Harbour MIBA site for use between August 2022 and May 2023. Assuming these materials have been 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 620 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* 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.

Tectonic's opinions are based upon information that existed at the time that the work was performed. The passage of time, man-made or natural events, may alter the site conditions. It is understood that the Services undertaken allowed Tectonic to form an opinion of the actual conditions of the site at the time the site was visited and cannot be used to assess the effect of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.

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.

Where data supplied by the client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by Tectonic for incomplete or inaccurate data supplied by others.

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Project Reference Number: LP140120
20 July 2023

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

M: 0417 884 155 E: michael@nebp.com.au

From: James Hall-Brown
Senior Environmental Scientist/Director
Lithaqua Environmental Services
PO Box 136, Peregian Beach, QLD 4573

M: 0401 671 624 E: james@lithaqua.com

Monitoring Summary Report
North Harbour – Surface Water Quality Monitoring Summary – 2022 / 2023 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 2019 – 2020 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 proper 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 location F. Over the reporting period, Location F (upstream Raff Creek tributary) has been recorded dry on 3 occasions. The lack of surface water at Location F is consistent with seasonal variations in flow encountered during previous reporting periods and the baseline data collected 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

Dissolved oxygen readings recorded during the monthly in-situ sampling events were consistently below the recommended WQOs at all locations except Location I (near the mouth of the Caboolture River) and Location G (adjacent to the eastern boundary of the project site on the Caboolture River). 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 consistently reported to be above the recommended water quality objective values at monitoring locations within the overall development site (A, D and F). 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).

Concentrations of chlorophyll A detected at sampling location A were considerably higher than concentrations detected at the downstream sampling location C in all sampling rounds. Concentrations of chlorophyll A detected at sampling location F were considerably higher than concentrations detected at the downstream sampling location D in all instances.

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 for all sampling events with exception to the September 2022 round at Location G and the June 2023 round at location H. The concentrations of Chlorophyll-a from this reporting period are consistent with the values recorded in previous reporting periods.

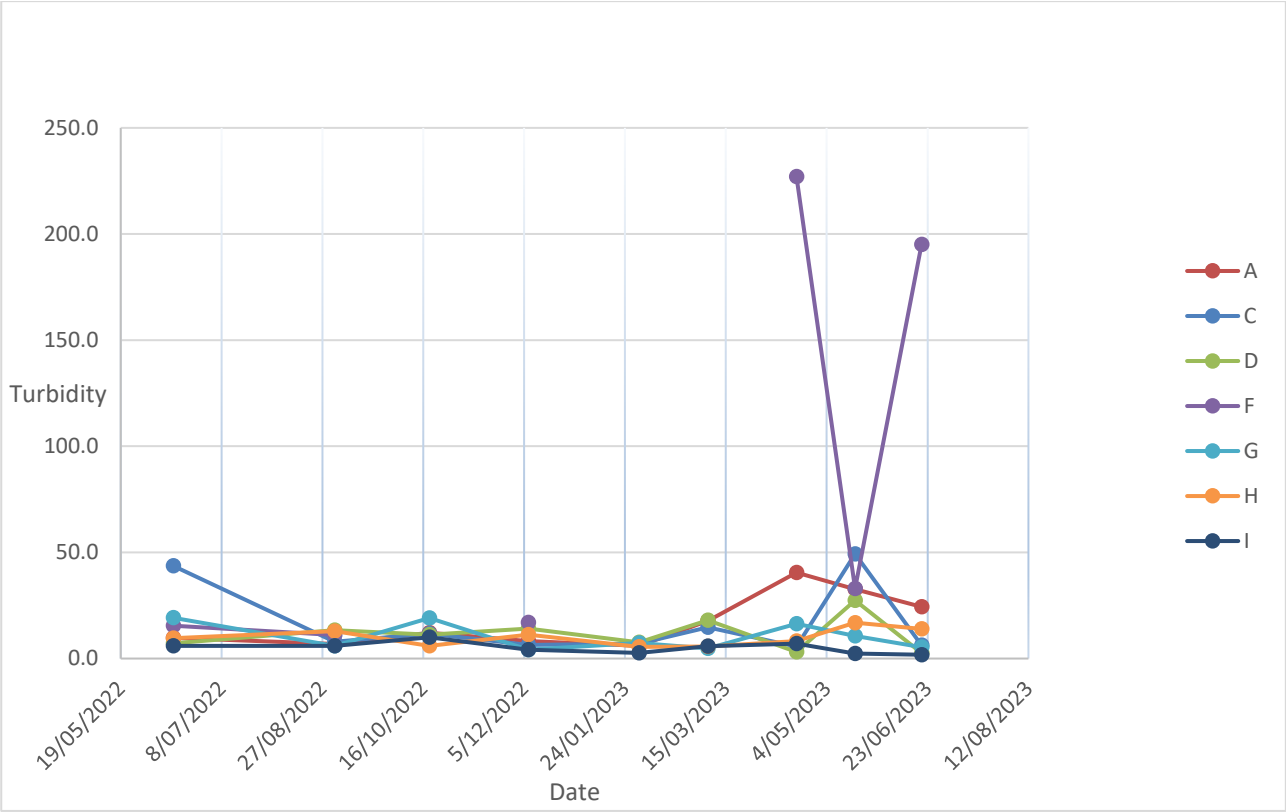
Turbidity

Turbidity readings taken during the 2022-2023 reporting period from the tidally influenced monitoring locations (C, D, G and H) showed consistent exceedances of the recommended WQOs as was observed prior to construction and during previous reporting periods during construction. At the furthermost downstream location (I), turbidity results were consistently below the recommended WQO.

The values recorded at freshwater locations (A and F) during this reporting period were consistent with values obtained for these locations during the pre-construction monitoring and previous reporting periods. Turbidity readings from freshwater locations upstream of the development (A and F) were comparable to the concentrations detected from the tidally influenced downstream locations (C and D). A spike in turbidity was recorded between April and June 2023.

The results from the current reporting period at locations A, C, D, and F 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. This is consistent with previous sampling rounds conducted at these locations during and pre-construction monitoring.

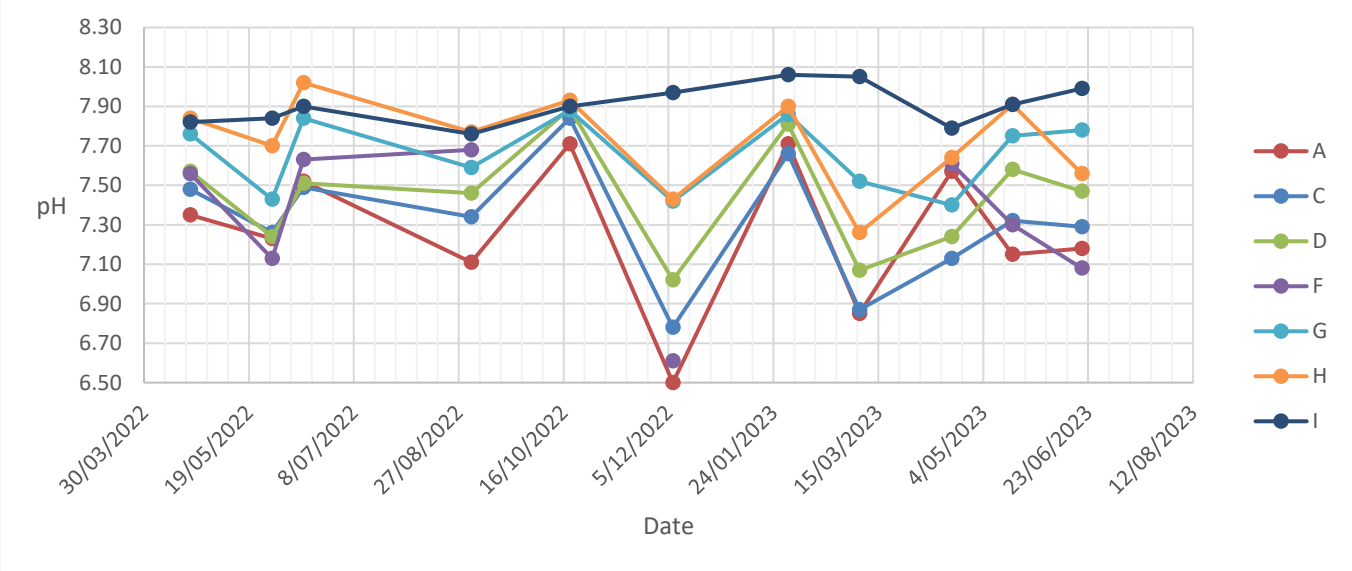
The pH values from the three monitoring locations on the Caboolture River (locations G, H and I), were all recorded to be within the acceptable WQOs. This is consistent with data collected during the pre-construction monitoring and the previous reporting periods.

pH values recorded at the tidally influenced monitoring location on Raff Creek (location C) were recorded to be within the recommended WQOs (pH 7.0 - 8.4) for all but two sampling events in December 2022 (pH 6.78) and March 2023 (pH 6.87).

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.

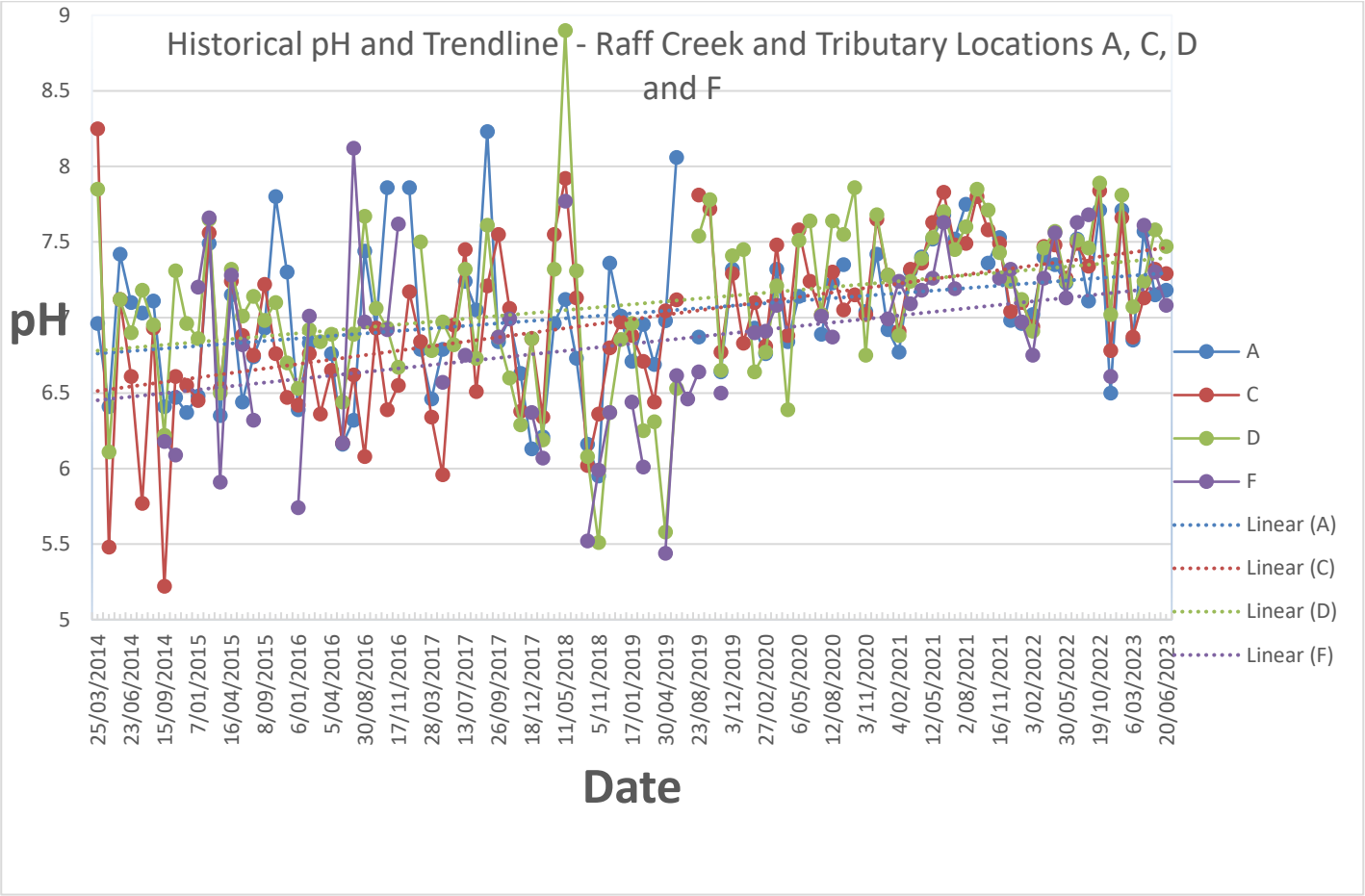


Historical Data Trends

The field and analytical data presented in Tables 1 to 7 indicates that the results from samples collected during the 2022 -2023 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 pH measurements from sampling locations within the development site (A, C, D and F) have been plotted to show the trend of pH over the total period of the development below in Graph 3.

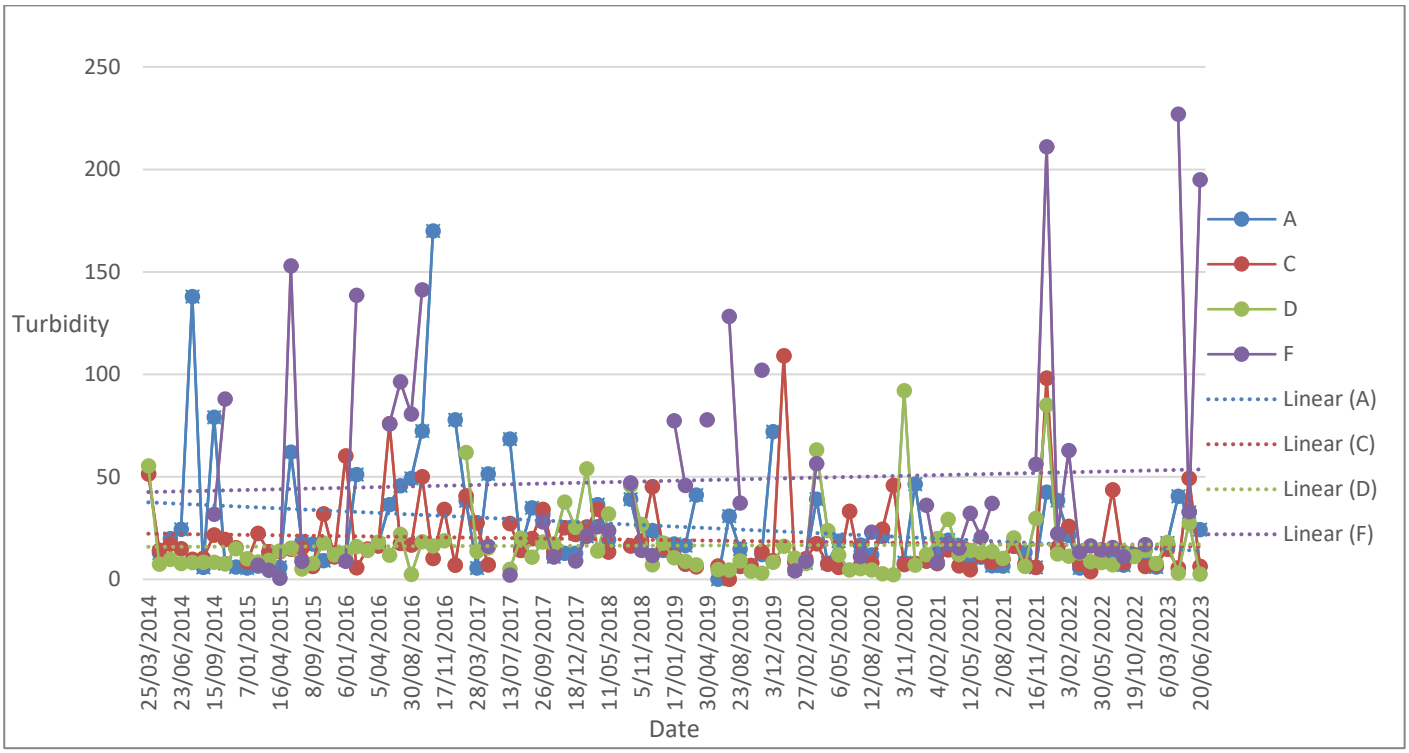
Graph 3. Historical pH Readings and Linear Trend – Locations A, C, D and F



Graph 3 demonstrates the overall trend of increasing pH values in sampling locations A, C, D and F. 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.

Historical turbidity measurements from sampling locations within the development site (A, C, D and F) have been plotted to show the trend of pH over the total period of the development below in Graph 4.

Graph 4. Historical Turbidity Readings and Linear Trend – Locations A, C D and F



Graph 4 demonstrates that turbidity readings that have been taken prior to and during construction from sampling locations A, C and D have decreased and location F has slightly increased. Location F is on the upstream boundary of the project area on the Raff Creek Tributary. As Location F is upstream of the development site, the increasing trend line suggests that sediment entrainment within the watershed that is upstream of this location (external to the site) has contributed to the positive linear trend for turbidity at this location. However, 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.

Conclusions

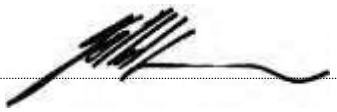
Based on the results of this monitoring, it appears that any impact to the quality of the surface water of the site, from past and current construction works has been mitigated and there is little evidence of any significant impact to the water quality since the commencement of construction activities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

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 H
Photograph 9 – Monitoring Location I
Photograph 10 – Monitoring Location I

Laboratory Reports

EB2216953
EB2218042
EB2225895
EB2230812
EB2232621
EB2236697
EB2302476
EB2306549
EB2311617
EB2314980
EB2318528

Tables

Table 1
Water Quality Monitoring Data Summary
Location A - Upstream Raff Creek
North Harbour - Water Quality Monitoring - 2022/2023 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	14/06/2022	**9.8**	**17.3**	**55**	**226**	**7.52**	**Plastic bottle**	<1
	A	2/09/2022	**6.9**	**18.5**	**65**	**296**	**7.11**	**Plastic barrier fencing**	**7**
	A	19/10/2022	**12.1**	**--**	**51.3**	**238**	**7.71**	**Plastic barrier fencing**	**7**
	A	7/12/2022	**8.2**	**25.4**	**59.7**	**190**	**6.50**	**No**	**8**
	A	31/01/2023	**6.0**	**25.2**	**84.1**	**216**	**7.71**	**No**	**16**
	A	6/03/2023	**17.7**	**23.1**	**17.1**	**298.3**	**6.85**	**No**	**56**
	A	19/04/2023	**40.5**	**21.1**	**16.9**	**170**	**7.57**	**Foam box**	**103**
	A	18/05/2023	**32.7**	**20.9**	**43.4**	**172**	**7.15**	**No**	<1
	A	20/06/2023	**24.3**	**19.7**	**54.6**	**314**	**7.18**	**Glass bottle**	**71**

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 - 2022/2023 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	14/06/2022	**43.6**	**19.1**	**81**	**3870**	**7.49**	**No**	<1
	C	2/09/2022	**8**	**19.8**	**67**	**4220**	**7.34**	**No**	**1**
	C	19/10/2022	**11.7**	**21.4**	**51.5**	**6890**	**7.84**	**Discarded crab pot**	**1**
	C	7/12/2022	**6.4**	**25.4**	**64.7**	**10500**	**6.78**	**No**	**4**
	C	31/01/2023	**7.0**	**25.1**	**46.1**	**6180**	**7.66**	**No**	**2**
	C	6/03/2023	**14.7**	**26.9**	**59.1**	**39546**	**6.87**	**Tin can**	**7**
	C	19/04/2023	**5.6**	**22.8**	**67.6**	**28600**	**7.13**	**Plastic bottle**	**6**
	C	18/05/2023	**49.3**	**20.7**	**48.6**	**359**	**7.32**	**Steel post**	<2
	C	20/06/2023	**6.3**	**19.2**	**73.5**	**11900**	**7.29**	**Plastic wrapper**	**1**

Notes:
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Table 3
Water Quality Monitoring Data Summary
Location D - Midstream Raff Creek Tributary
North Harbour - Water Quality Monitoring - 2022/2023 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	14/06/2022	**7.2**	**18.7**	**62**	**552**	**7.51**	**No**	<1
	D	2/09/2022	**13.3**	**19.9**	**50**	**746**	**7.46**	**No**	**2**
	D	19/10/2022	**11.2**	**21.8**	**98.5**	**16100**	**7.89**	**Plastic bottle**	**29**
	D	7/12/2022	**14.1**	**28.2**	**77.6**	**7202**	**7.02**	**Plastic bottle**	**5**
	D	31/01/2023	**7.7**	**27.8**	**42.7**	**16200**	**7.81**	**No**	**36**
	D	6/03/2023	**18.1**	**26.3**	**84.1**	**33880**	**7.07**	**No**	**8**
	D	19/04/2023	**3.1**	**22.6**	**66.2**	**30900**	**7.24**	**Aluminium Can**	**13**
	D	18/05/2023	**27.4**	**21.1**	**61.8**	**286**	**7.58**	**No**	**4**
	D	20/06/2023	**2.6**	**19.4**	**67.9**	**16600**	**7.47**	**No**	**--**

Notes:
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Table 4
Water Quality Monitoring Data Summary
Location F - Upstream Raff Creek Tributary
North Harbour - Water Quality Monitoring - 2022/2023 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	14/06/2022	**15.5**	**19.3**	**80**	**220**	**7.63**	**No**	**10**
	F	2/09/2022	**11.1**	**19.4**	**56**	**457**	**7.68**	**No**	**6**
	F	19/10/2022	**Dry - sample not collected**						
	F	7/12/2022	**17.0**	**24.7**	**61.4**	**268.8**	**6.61**	**No**	**10**
	F	31/01/2023	**Dry - sample not collected**						
	F	6/03/2023	**Dry - sample not collected**						
	F	19/04/2023	**227.0**	**22.1**	**27.9**	**196**	**7.61**	**No**	**68**
	F	18/05/2023	**33.0**	**20.1**	**34.4**	**180**	**7.30**	**No**	**14**
	F	20/06/2023	**195.0**	**19.2**	**67.8**	**248**	**7.08**	**Plastic Bottle**	**7**

Notes:
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Table 5
Water Quality Monitoring Data Summary
Location G - Caboolture River
North Harbour - Water Quality Monitoring - 2022/2023 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	14/06/2022	**19.2**	**19.3**	**84**	**5770**	**7.84**	**No**	**7**
	G	2/09/2022	**5.9**	**20.4**	**73**	**21800**	**7.59**	**No**	**3**
	G	19/10/2022	**19.1**	**22.7**	**85.3**	**31200**	**7.88**	**Broken glass**	**11**
	G	7/12/2022	**4.2**	**26.2**	**91.5**	**20767**	**7.42**	**No**	**7**
	G	31/01/2023	**7.4**	**26**	**63.5**	**26800**	**7.86**	**No**	**10**
	G	6/03/2023	**4.7**	**27.3**	**79.2**	**43820**	**7.52**	**No**	**9**
	G	19/04/2023	**16.3**	**22.9**	**81.9**	**27700**	**7.40**	**No**	**18**
	G	18/05/2023	**10.7**	**20.4**	**77.2**	**22400**	**7.75**	**Plastic bag**	**10**
	G	20/06/2023	**5.4**	**19.3**	**87.7**	**41000**	**7.78**	**Timber pallet**	**7**

Notes:
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Table 6
Water Quality Monitoring Data Summary
Location H - Caboolture River
North Harbour - Water Quality Monitoring - 2022/2023 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	14/06/2022	**9.6**	**18.8**	**86**	**446**	**8.02**	**Plastic wrappers and newspaper**	**7**
	H	2/09/2022	**12.9**	**21.4**	**75**	**973**	**7.77**	**Dead calf and steel fence**	**6**
	H	19/10/2022	**6**	**22.1**	**68.5**	**2630**	**7.93**	**Plastic bags and bottles**	**7**
	H	7/12/2022	**11.3**	**26.9**	**70.4**	**865**	**7.43**	**No**	**22**
	H	31/01/2023	**5.5**	**26.1**	**54.2**	**4870**	**7.90**	**Plastic wrappers**	**10**
	H	6/03/2023	**5.6**	**27.1**	**71.3**	**15072**	**7.26**	**Broken glass**	**12**
	H	19/04/2023	**8.2**	**22**	**70.3**	**12400**	**7.64**	**Broken glass**	**19**
	H	18/05/2023	**16.9**	**20.0**	**70.6**	**628**	**7.91**	**Plastic bottle and aluminium cans**	**4**
	H	20/06/2023	**14.0**	**19.6**	**63.9**	**12400**	**7.56**	**No**	**2**

Notes:
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Table 7
Water Quality Monitoring Data Summary
Location I - Caboolture River
North Harbour - Water Quality Monitoring - 2022/2023
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	14/06/2022	**6.0**	**19.4**	**99**	**31800**	**7.90**	**Glass bottle**	**3**
	I	2/09/2022	**6.0**	**21.2**	**77**	**35800**	**7.76**	**Bait packet**	**1**
	I	19/10/2022	**10**	**22.1**	**75.6**	**46600**	**7.9**	**No**	**6**
	I	7/12/2022	**4.2**	**26.6**	**87.4**	**45025**	**7.97**	**No**	**7**
	I	31/01/2023	**2.7**	**26.1**	**74.6**	**46300**	**8.06**	**No**	**4**
	I	6/03/2023	**5.8**	**26.2**	**95.3**	**64094**	**8.05**	**Plastic bucket**	<1
	I	19/04/2023	**7.0**	**23.8**	**84.1**	**52700**	**7.79**	**No**	**12**
	I	18/05/2023	**2.4**	**21.1**	**91.2**	**54700**	**7.91**	**Plastic bottle**	**2**
	I	20/06/2023	**1.8**	**19.9**	**98.7**	**50200**	**7.99**	**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;
- "°" 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.

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 September 2022.

Photograph 2: Location C taken in December 2022.

Photograph 3: A photograph of upstream of Location C in December 2022 showing the existing crossing with the new crossing under construction.

Photograph 4: Location D in December 2022 with sediment control boom installed downstream of the sample location.

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

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

Photograph 7: Location H after flooding of the Caboolture River in September 2022 with dead calf visible on the shoreline.

Photograph 8: This photograph was taken in March 2023 showing Location H.

Photograph 9: This photograph was taken in December 2022 showing Location I.

Photograph 10: This photograph was taken in January 2023 showing Location I.

Laboratory Reports

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2216953**	Page	: 1 of 4
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 WQM LP14012B	Date Samples Received	: 14-Jun-2022 14:10
Order number	: ----	Date Analysis Commenced	: 14-Jun-2022
C-O-C number	: ----	Issue Date	: 22-Jun-2022 16:57
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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
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	14-Jun-2022 00:00	14-Jun-2022 00:00	14-Jun-2022 00:00	14-Jun-2022 00:00	14-Jun-2022 00:00
Compound	CAS Number	LOR	Unit	EB2216953-001	EB2216953-002	EB2216953-003	EB2216953-004	EB2216953-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.52**	**7.49**	**7.51**	**7.63**	**7.84**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**226**	**3870**	**552**	**220**	**5770**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**9.8**	**43.6**	**7.2**	**15.5**	**19.2**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	<1	<1	<1	**10**	**7**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**55.0**	**81.0**	**62.0**	**80.0**	**84.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	H	I	----	----	----
			Sampling date / time	14-Jun-2022 00:00	14-Jun-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2216953-006	EB2216953-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**8.02**	**7.90**	**----**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**446**	**31800**	**----**	**----**	**----**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**9.6**	**6.0**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**7**	**3**	**----**	**----**	**----**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**86.0**	**99.0**	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2216953**	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 WQM LP14012B	Date Samples Received	: 14-Jun-2022
Order number	: ----	Date Analysis Commenced	: 14-Jun-2022
C-O-C number	: ----	Issue Date	: 22-Jun-2022
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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 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
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%.

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: 4403304)									
EB2216820-009	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.26	8.27	0.1	0% - 20%
EB2216820-019	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.99	7.98	0.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4403303)									
EB2216820-009	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1280	1280	0.2	0% - 20%
EB2216820-019	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	3130	3140	0.3	0% - 20%
EA045: Turbidity (QC Lot: 4400202)									
EB2216816-007	Anonymous	EA045: Turbidity	----	0.1	NTU	1480	1480	0.3	0% - 20%
EB2216816-017	Anonymous	EA045: Turbidity	----	0.1	NTU	2.2	2.1	0.0	0% - 20%
EA045: Turbidity (QC Lot: 4400203)									
EB2216953-005	G	EA045: Turbidity	----	0.1	NTU	19.2	19.6	2.1	0% - 20%
EB2216967-012	Anonymous	EA045: Turbidity	----	0.1	NTU	1.9	1.9	0.0	0% - 50%

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	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4403304)								
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: 4403303)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	100	90.0	106
				<1	24800 µS/cm	98.3	90.0	106
EA045: Turbidity (QCLot: 4400202)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	100	90.0	110
				<0.1	40 NTU	100	90.0	110
				<0.1	400 NTU	100	90.0	110
EA045: Turbidity (QCLot: 4400203)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	100	90.0	110
				<0.1	40 NTU	100	90.0	110
				<0.1	400 NTU	100	90.0	110
EP008: Chlorophyll (QCLot: 4402612)								
EP008: Chlorophyll a	----	1	mg/m³	<1	18 mg/m³	100	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.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2216953**	Page	: 1 of 5
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: NHH WQM LP14012B	Date Samples Received	: 14-Jun-2022
Site	: ----	Issue Date	: 22-Jun-2022
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 / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	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, D, F, G, H, I	----	----	----	16-Jun-2022	14-Jun-2022	**2**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
A, C, D, F, G, H, I	**14-Jun-2022**	**----**	----	----	**16-Jun-2022**	14-Jun-2022	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, F, G, H, I	**14-Jun-2022**	**----**	----	----	**16-Jun-2022**	12-Jul-2022	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, F, G, H, I	**14-Jun-2022**	**----**	----	----	**15-Jun-2022**	16-Jun-2022	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, F, G, H, I	**14-Jun-2022**	**----**	----	----	**16-Jun-2022**	16-Jun-2022	✓
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, F, G, H, I	**14-Jun-2022**	**----**	----	----	**14-Jun-2022**	14-Jun-2022	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	2	19	**10.53**	**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	4	40	**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	19	**10.53**	**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	6	40	**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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	40	**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)

CHAIN OF CUSTODY

ALS Laboratory: please tick →

Environmental Division Brisbane
Work Order Reference
EB2216953

Telephone: +61-7-3243 7222

CLIENT:	LITHAGUA PTY LTD
OFFICE:	PEREGIAN BEACH
PROJECT:	NHH WQM LP140126
PROJECT NO.:	
ORDER NUMBER:	
PURCHASE ORDER NO.:	
PROJECT MANAGER:	JAMES HALL-BROWN
CONTACT PH:	0401671624
SAMPLER:	"
SAMPLER MOBILE:	"
COC Emailed to ALS? (YES / NO)	NO
EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed):	james@lithagua.com
Email Invoice to (will default to PM if no other addresses are listed):	"

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)
☐ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle)
COC: (1) 2 3 4 5 6 7
OF: (1) 2 3 4 5 6 7

FOR LABORATORY USE: Custody Seal Intact? Free ice / frozen ice bricks present upon receipt? Random Sample Temperature on Receipt: Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:
JAMES HALL-BROWN	JB	
DATE/TIME: 14/6/22 14:10	DATE/TIME: 14/6/22 1410	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.	D.O. (% only)	TURBIDITY	CHLOROPHYLL-A				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	A	14/6/22	W	P	2	X	X	X	X	X				HT
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	"	"	"	"	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 Thiosulfate Preserved Bottles.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2225895**	Page	: 1 of 4
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	: North Harbour Surface Water Sampling	Date Samples Received	: 02-Sep-2022 11:18
Order number	: LP140120	Date Analysis Commenced	: 02-Sep-2022
C-O-C number	: ----	Issue Date	: 10-Nov-2022 13:00
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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Signatories

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Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

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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	02-Sep-2022 00:00	02-Sep-2022 00:00	02-Sep-2022 00:00	02-Sep-2022 00:00	02-Sep-2022 00:00
Compound	CAS Number	LOR	Unit	EB2225895-001	EB2225895-002	EB2225895-003	EB2225895-004	EB2225895-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.11	7.34	7.46	7.68	7.59
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	296	4220	746	457	21800
EA045: Turbidity								
Turbidity	----	0.1	NTU	6.9	8.0	13.3	11.1	5.9
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	7	1	2	6	3
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	65.0	67.0	50.0	56.0	73.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	H	I	----	----	----
			Sampling date / time	02-Sep-2022 00:00	02-Sep-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2225895-006	EB2225895-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.77**	**7.76**	**----**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**973**	**35800**	**----**	**----**	**----**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**12.9**	**6.0**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**6**	**1**	**----**	**----**	**----**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**75.0**	**77.0**	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2225895**	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	: North Harbour Surface Water Sampling	Date Samples Received	: 02-Sep-2022
Order number	: LP140120	Date Analysis Commenced	: 02-Sep-2022
C-O-C number	: ----	Issue Date	: 10-Nov-2022
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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 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
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%.

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: 4557725)									
EB2225858-011	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.09	7.14	0.7	0% - 20%
EB2225858-008	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.01	8.11	1.2	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4557726)									
EB2225858-011	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	140	140	0.0	0% - 20%
EB2225858-008	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1080	1080	0.3	0% - 20%
EA045: Turbidity (QC Lot: 4557927)									
EB2225808-002	Anonymous	EA045: Turbidity	----	0.1	NTU	15.3	15.2	0.7	0% - 20%
EB2225851-005	Anonymous	EA045: Turbidity	----	0.1	NTU	22.2	22.1	0.5	0% - 20%
EA045: Turbidity (QC Lot: 4557928)									
EB2225895-005	G	EA045: Turbidity	----	0.1	NTU	5.9	5.9	0.0	0% - 20%
EB2225904-005	Anonymous	EA045: Turbidity	----	0.1	NTU	1.2	1.2	0.0	0% - 50%
EP025: Oxygen - Dissolved (DO) (QC Lot: 4557605)									
EB2225895-001	A	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	65.0	65.0	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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4557725)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.5	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4557726)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	100	90.0	106
				<1	24800 µS/cm	98.2	90.0	106
EA045: Turbidity (QCLot: 4557927)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	101	90.0	110
				<0.1	40 NTU	104	90.0	110
				<0.1	400 NTU	102	90.0	110
EA045: Turbidity (QCLot: 4557928)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	101	90.0	110
				<0.1	40 NTU	104	90.0	110
				<0.1	400 NTU	102	90.0	110
EP008: Chlorophyll (QCLot: 4558379)								
EP008: Chlorophyll a	----	1	mg/m³	<1	16 mg/m³	94.3	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	: **EB2225895**	Page	: 1 of 4
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: North Harbour Surface Water Sampling	Date Samples Received	: 02-Sep-2022
Site	: ----	Issue Date	: 10-Nov-2022
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: LP140120	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 / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		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, F, G, H, I	**02-Sep-2022**	**----**	----	----	**02-Sep-2022**	02-Sep-2022	✓
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, F, G, H, I	**02-Sep-2022**	**----**	----	----	**02-Sep-2022**	30-Sep-2022	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, F, G, H, I	**02-Sep-2022**	**----**	----	----	**02-Sep-2022**	04-Sep-2022	✓
EP008: Chlorophyll a & Pheophytin a							
Opaque Plastic Bottle - Unpreserved (EP008)							
A, C, D, F, G, H, I	**02-Sep-2022**	**----**	----	----	**02-Sep-2022**	04-Sep-2022	✓
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, F, G, H, I	**02-Sep-2022**	**----**	----	----	**02-Sep-2022**	02-Sep-2022	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	2	12	**16.67**	**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	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	4	40	**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	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	6	40	**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	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	40	**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)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EB2225895**		
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	: North Harbour Surface Water Sampling	Page	: 1 of 2
Order number	: LP140120	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	: 02-Sep-2022 11:18	Issue Date	: 02-Sep-2022
Client Requested Due Date	: 08-Sep-2022	Scheduled Reporting Date	: **08-Sep-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 4.9°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%
EB2225895-001	02-Sep-2022 00:00	A	✓	✓	✓	✓	✓
EB2225895-002	02-Sep-2022 00:00	C	✓	✓	✓	✓	✓
EB2225895-003	02-Sep-2022 00:00	D	✓	✓	✓	✓	✓
EB2225895-004	02-Sep-2022 00:00	F	✓	✓	✓	✓	✓
EB2225895-005	02-Sep-2022 00:00	G	✓	✓	✓	✓	✓
EB2225895-006	02-Sep-2022 00:00	H	✓	✓	✓	✓	✓
EB2225895-007	02-Sep-2022 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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT:	LITHAQUA PTY LTD
OFFICE:	PEREGIAN BEACH
PROJECT:	NORTH HARBOUR SURFACE WATER SAMPLING
ORDER NUMBER:	LP140120
PURCHASE ORDER NO.:	
PROJECT MANAGER:	J. HALL-BROWN
CONTACT PH:	0401 671624
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
Email Invoice to (will default to PM if no other addresses are listed):	

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

☒ Standard TAT (List due date):

☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: LITSNU

COUNTRY OF ORIGIN: AUSTRALIA

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

OF: 1 2 3 4 5 6 7

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

Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
J HALL-BROWN	[signature]		
DATE/TIME: 2/9/22 11:18	DATE/TIME: 2/9/22 1118	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	pH	E.C.	DO (% ONLY)	TURBIDITY	CHLOROPHYLL-A				Additional Information
1	A	2/9/2022	W	Px2	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				
					TOTAL									

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: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

HYT

Environmental Division
Brisbane
Work Order Reference
EB2225895

Telephone : + 61-7-3243 7222

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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2230812**	Page	: 1 of 4
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 WATER QUALITY	Date Samples Received	: 19-Oct-2022 13:55
Order number	: ----	Date Analysis Commenced	: 19-Oct-2022
C-O-C number	: ----	Issue Date	: 10-Nov-2022 13:00
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

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
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	G	H
			Sampling date / time	19-Oct-2022 00:00	19-Oct-2022 00:00	19-Oct-2022 00:00	19-Oct-2022 00:00	19-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2230812-001	EB2230812-002	EB2230812-003	EB2230812-004	EB2230812-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.71	7.84	7.89	7.88	7.93
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	238	6890	16100	31200	2630
EA045: Turbidity								
Turbidity	----	0.1	NTU	12.1	11.7	11.2	19.1	6.0
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	7	1	29	11	7
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	51.3	51.5	98.5	85.3	68.5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	I	----	----	----	----
			Sampling date / time	19-Oct-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2230812-006	--------	--------	--------	--------
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.90**	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**46600**	----	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	**10.0**	----	----	----	----
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**6**	----	----	----	----
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**75.6**	----	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2230812**	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 WATER QUALITY	Date Samples Received	: 19-Oct-2022
Order number	: ----	Date Analysis Commenced	: 19-Oct-2022
C-O-C number	: ----	Issue Date	: 10-Nov-2022
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

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 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
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%.

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: 4648842)									
EB2230748-006	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.18	8.27	1.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4648843)									
EB2230748-006	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	738	738	0.0	0% - 20%
EA045: Turbidity (QC Lot: 4648437)									
EB2224737-001	Anonymous	EA045: Turbidity	----	0.1	NTU	1.0	1.0	0.0	0% - 50%
EB2230752-005	Anonymous	EA045: Turbidity	----	0.1	NTU	9.3	9.3	0.0	0% - 20%
EA045: Turbidity (QC Lot: 4648438)									
EB2230812-005	H	EA045: Turbidity	----	0.1	NTU	6.0	6.0	0.0	0% - 20%
EP025: Oxygen - Dissolved (DO) (QC Lot: 4648433)									
EB2230268-001	Anonymous	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	83.4	83.4	0.0	0% - 20%
EB2230812-005	H	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	68.5	68.5	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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4648842)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	101	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4648843)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	101	90.0	106
				<1	12890 µS/cm	100	90.0	106
EA045: Turbidity (QCLot: 4648437)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	102	90.0	110
				<0.1	40 NTU	104	90.0	110
				<0.1	400 NTU	103	90.0	110
EA045: Turbidity (QCLot: 4648438)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	102	90.0	110
				<0.1	40 NTU	104	90.0	110
				<0.1	400 NTU	103	90.0	110
EP008: Chlorophyll (QCLot: 4651909)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	89.7	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.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2230812**	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 WATER QUALITY	Date Samples Received	: 19-Oct-2022
Site	: ----	Issue Date	: 10-Nov-2022
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

- **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 / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		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	**19-Oct-2022**	**----**	----	----	**19-Oct-2022**	19-Oct-2022	✓
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, G, H, I	**19-Oct-2022**	**----**	----	----	**19-Oct-2022**	16-Nov-2022	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, G, H, I	**19-Oct-2022**	**----**	----	----	**19-Oct-2022**	21-Oct-2022	✓
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, G, H, I	**19-Oct-2022**	**----**	----	----	**21-Oct-2022**	21-Oct-2022	✓
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, G, H, I	**19-Oct-2022**	**----**	----	----	**19-Oct-2022**	19-Oct-2022	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Oxygen - Dissolved	EP025	2	6	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	6	22	**27.27**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	22	**9.09**	**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)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2230812**

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 WATER QUALITY	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	: 19-Oct-2022 13:55	Issue Date	: 19-Oct-2022
Client Requested Due Date	: 27-Oct-2022	Scheduled Reporting Date	: **27-Oct-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 6.6°C - Ice present
Receipt Detail	: MEDIUM HARD ESKY	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% DO and DO Saturation%
EB2230812-001	19-Oct-2022 00:00	A	✓	✓	✓	✓	✓
EB2230812-002	19-Oct-2022 00:00	C	✓	✓	✓	✓	✓
EB2230812-003	19-Oct-2022 00:00	D	✓	✓	✓	✓	✓
EB2230812-004	19-Oct-2022 00:00	G	✓	✓	✓	✓	✓
EB2230812-005	19-Oct-2022 00:00	H	✓	✓	✓	✓	✓
EB2230812-006	19-Oct-2022 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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ ADELAIDE 21 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 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐ MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐ MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐ MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐ NEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐ NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com
☐ PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐ SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 [illegible]
☐ TOWNSVILLE Ph: 07 4796 [illegible]
☐ WOLLONGONG Ph: 02 4225 [illegible]

Environmental Division
Brisbane
Work Order Reference
EB2230812

Telephone : + 61-7-3243 7222

CLIENT:	LITHAQUA PTY LTD
OFFICE:	Peregian Beach
PROJECT:	N'HH Water Quality
PROJECT NO.:	PR0072
ORDER NUMBER:	
PURCHASE ORDER NO.:	
PROJECT MANAGER:	James Hall-Brown
CONTACT PH:	0460 671624
SAMPLER:	"
SAMPLER MOBILE:	"
COC Emailed to ALS? (YES / NO)	NO (circled)
EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed):	james@lithaqua.com
Email Invoice to (will default to PM if no other addresses are listed):	

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics).
☑ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:
COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle)
COC: (1) 2 3 4 5 6 7
OF: (1) 2 3 4 5 6 7

FOR LABORATORY USE ONLY
Custody Seal Intact
Free ice / frozen ice bricks present upon receipt?
Random Sample Temperature
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:
[signature]	[signature]	
DATE/TIME: 19/10/22 13:55	DATE/TIME: 19/10/22 1355	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	CHLOROPHYLL-A	pH	TURBIDITY	E.C.	D.O. (% only)				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	A	19/10/22	W	P x 2	2	X	X	X	X	X				
	C		"		"	X	X	X	X	X				
	D		"		"	X	X	X	X	X				
	G		"		"	X	X	X	X	X				
	H		"		"	X	X	X	X	X				
	I		"		"									
				TOTAL										

HT

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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2236697**	Page	: 1 of 4
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-Dec-2022 13:34
Order number	: ----	Date Analysis Commenced	: 08-Dec-2022
C-O-C number	: ----	Issue Date	: 23-Feb-2023 09:02
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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
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-Dec-2022 12:20	07-Dec-2022 12:40	07-Dec-2022 13:00	07-Dec-2022 13:20	07-Dec-2022 11:40
Compound	*CAS Number*	*LOR*	*Unit*	**EB2236697-001**	**EB2236697-002**	**EB2236697-003**	**EB2236697-004**	**EB2236697-005**
				Result	Result	Result	Result	Result
EA045: Turbidity								
Turbidity	----	0.1	NTU	**8.2**	**6.4**	**14.1**	**17.0**	**4.2**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**8**	**4**	**5**	**10**	**7**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	H	I	----	----	----
				Sampling date / time	07-Dec-2022 12:00	07-Dec-2022 11:20	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EB2236697-006**	**EB2236697-007**	--------	--------	--------
					Result	Result	----	----	----
EA045: Turbidity									
Turbidity	----	0.1	NTU		**11.3**	**6.9**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		**22**	**2**	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2236697**	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-Dec-2022
Order number	: ----	Date Analysis Commenced	: 08-Dec-2022
C-O-C number	: ----	Issue Date	: 23-Feb-2023
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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 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
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%.

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 (%)*
EA045: Turbidity (QC Lot: 4755809)									
EB2232982-004	Anonymous	EA045: Turbidity	----	0.1	NTU	2.6	2.6	0.0	0% - 20%
EB2236697-007	I	EA045: Turbidity	----	0.1	NTU	6.9	6.9	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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA045: Turbidity (QCLot: 4755809)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	104	90.0	110
				<0.1	40 NTU	103	90.0	110
				<0.1	400 NTU	101	90.0	110
EP008: Chlorophyll (QCLot: 4756239)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	92.0	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.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2236697**	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-Dec-2022
Site	: ----	Issue Date	: 23-Feb-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 / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, F, G, H, I	**07-Dec-2022**	**----**	----	----	**08-Dec-2022**	09-Dec-2022	✓
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, F, G, H, I	**07-Dec-2022**	**----**	----	----	**09-Dec-2022**	09-Dec-2022	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Turbidity	EA045	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	17	**17.65**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	17	**5.88**	**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
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.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2236697**

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-Dec-2022 13:34	Issue Date	: 07-Dec-2022
Client Requested Due Date	: 15-Dec-2022	Scheduled Reporting Date	: **15-Dec-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 17.6°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 - EA045 Turbidity	WATER - EP008 Chlorophyll a
EB2236697-001	07-Dec-2022 12:20	A	✓	✓
EB2236697-002	07-Dec-2022 12:40	C	✓	✓
EB2236697-003	07-Dec-2022 13:00	D	✓	✓
EB2236697-004	07-Dec-2022 13:20	F	✓	✓
EB2236697-005	07-Dec-2022 11:40	G	✓	✓
EB2236697-006	07-Dec-2022 12:00	H	✓	✓
EB2236697-007	07-Dec-2022 11:20	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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

Environmental Division Brisbane
Work Order Reference
EB2236697

Telephone : + 61-7-3243 7222

CLIENT:	LITHAQUA PTY LTD
OFFICE:	PELICAN BEACH
PROJECT:	NAH SURFACE WATER
PROJECT NO:	P140120
ORDER NUMBER:	
PURCHASE ORDER NO.:	
PROJECT MANAGER:	J. HALL-BROWN
CONTACT PH:	0401 671624
SAMPLER:	"
SAMPLER MOBILE:	"
COC Emailed to ALS? (YES / NO)	NO
EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed):	james@lithaqua.com
Email Invoice to (will default to PM if no other addresses are listed):	

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:
COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle)
COC: (1) 2 3 4 5 6 7
OF: (1) 2 3 4 5 6 7

FOR LABORATORY: Custody Seal Intact? Free ice / frozen ice bricks present upon receipt? Random Sample Temperature on Receipt: Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:
James Hall-Brown	BG	
DATE/TIME: 1335 7/12/22	DATE/TIME: 7.12.22 1334	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	CHLOROPHYLL-A	TURBIDITY									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	A	7/12/22 1220	W	P×2	2	X	X									
2	C	7/12/22 1240	W		2	X	X									
3	D	7/12/22 1300	W		2	X	X									
4	F	7/12/22 1320	W		2	X	X									
5	G	7/12/22 1140	W		2	X	X									
6	H	7/12/22 1200	W		2	X	X									
7	I	7/12/22 1120	W		2	X	X									
				TOTAL	14	7	7									

SCANNED

HT

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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2302476**	Page	: 1 of 4
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 - North Harbour Holdings	Date Samples Received	: 31-Jan-2023 10:26
Order number	: ----	Date Analysis Commenced	: 31-Jan-2023
C-O-C number	: ----	Issue Date	: 23-Feb-2023 09:02
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

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	31-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00
Compound	CAS Number	LOR	Unit	EB2302476-001	EB2302476-002	EB2302476-003	EB2302476-004	EB2302476-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.71	7.66	7.81	7.86	7.90
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	216	6180	16200	26800	4870
EA045: Turbidity								
Turbidity	----	0.1	NTU	6.0	7.0	7.7	7.4	5.5
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	16	2	36	10	20
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	84.1	46.1	42.7	63.5	52.4

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	I	----	----	----	----
			Sampling date / time	31-Jan-2023 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EB2302476-006**	--------	--------	--------	--------
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**8.06**	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**46300**	----	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	**2.7**	----	----	----	----
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**4**	----	----	----	----
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**74.6**	----	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2302476**	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 - North Harbour Holdings	Date Samples Received	: 31-Jan-2023
Order number	: ----	Date Analysis Commenced	: 31-Jan-2023
C-O-C number	: ----	Issue Date	: 23-Feb-2023
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

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 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: 4843436)									
EB2302476-003	D	EA005-P: pH Value	----	0.01	pH Unit	7.81	7.84	0.4	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4843432)									
EB2301783-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	40	40	0.0	0% - 20%
EB2302432-004	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	3430	3440	0.3	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4843437)									
EB2302476-003	D	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	16200	16100	0.6	0% - 20%
EA045: Turbidity (QC Lot: 4849134)									
EB2238491-006	Anonymous	EA045: Turbidity	----	0.1	NTU	1.3	1.3	0.0	0% - 50%
EB2302476-004	G	EA045: Turbidity	----	0.1	NTU	7.4	7.5	0.0	0% - 20%
EP025: Oxygen - Dissolved (DO) (QC Lot: 4843414)									
EB2302455-001	Anonymous	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	64.7	64.7	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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4843436)								
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: 4843432)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	97.6	90.0	106
				<1	12890 µS/cm	98.2	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 4843437)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	92.6	90.0	106
				<1	24800 µS/cm	96.9	90.0	106
EA045: Turbidity (QCLot: 4849134)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	100	90.0	110
				<0.1	40 NTU	98.5	90.0	110
				<0.1	400 NTU	100	90.0	110
EP008: Chlorophyll (QCLot: 4843442)								
EP008: Chlorophyll a	----	1	mg/m³	<1	17 mg/m³	101	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.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2302476**	Page	: 1 of 5
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 - North Harbour Holdings	Date Samples Received	: 31-Jan-2023
Site	: ----	Issue Date	: 23-Feb-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 / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	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, D, G, H, I	----	----	----	01-Feb-2023	31-Jan-2023	**1**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
A, C, D, G, H, I	**31-Jan-2023**	**----**	----	----	**01-Feb-2023**	31-Jan-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, G, H, I	**31-Jan-2023**	**----**	----	----	**01-Feb-2023**	28-Feb-2023	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, G, H, I	**31-Jan-2023**	**----**	----	----	**02-Feb-2023**	02-Feb-2023	✓
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, G, H, I	**31-Jan-2023**	**----**	----	----	**02-Feb-2023**	02-Feb-2023	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, G, H, I	**31-Jan-2023**	**----**	----	----	**31-Jan-2023**	31-Jan-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	3	24	**12.50**	**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	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	4	24	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	6	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	16	**18.75**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	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
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)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2302476**

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 - North Harbour Holdings	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-Jan-2023 10:26	Issue Date	: 31-Jan-2023
Client Requested Due Date	: 03-Feb-2023	Scheduled Reporting Date	: **03-Feb-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 7.7°C - Ice present
Receipt Detail	: Medium Esky	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% DO and DO Saturation%
EB2302476-001	31-Jan-2023 00:00	A	✓	✓	✓	✓	✓
EB2302476-002	31-Jan-2023 00:00	C	✓	✓	✓	✓	✓
EB2302476-003	31-Jan-2023 00:00	D	✓	✓	✓	✓	✓
EB2302476-004	31-Jan-2023 00:00	G	✓	✓	✓	✓	✓
EB2302476-005	31-Jan-2023 00:00	H	✓	✓	✓	✓	✓
EB2302476-006	31-Jan-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

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 46 Callemondah Drive Gladstone QLD 4680 Ph: 07 4978 7944 E: ALSEnviro.Gladstone@alsglobal.com
☐MACKAY 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
☐MUDGEE 1/29 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com
☐PERTH 26 Rigali Way Wangara WA 6065 Ph: 08 9406 1301 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 13 Carlton Street Kirwan QLD 4817 Ph: 07
☐WO Ph: 0

Environmental Division
Brisbane
Work Order Reference
EB2302476

Telephone : + 61-7-3243 7222

CLIENT: LITHAQUA PTY LTD
OFFICE: PEREGIAN BEACH SURGANS WATER
PROJECT: NORTH HARBOUR HOLDINGS PROJECT NO: LP140120
ORDER NUMBER: PURCHASE ORDER NO.:
PROJECT MANAGER: JAMES HALL-BROWN CONTACT PH: 0401 671 624
SAMPLER: " SAMPLER MOBILE: "
COC Emailed to ALS? (YES / NO) — NO circled
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): james@lithaqua.com
Email Invoice to (will default to PM if no other addresses are listed): "

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
☑ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: LITENV
COUNTRY OF ORIGIN:
COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7

FOR LABORATORY USE: Custody Seal Intact? N/A; Free ice / frozen ice bricks present upon receipt? N/A; Random Sample; Other comment

RELINQUISHED BY: J. HALL-BROWN DATE/TIME: 31/1/23 10:15
RECEIVED BY: SW DATE/TIME: 31.1.23 1028
RELINQUISHED BY: 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.	D.O. (% only)	TURBIDITY	CHLOROPHYLL-A				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	A	31/1/23	W	P	2	X	X	X	X	X				
2	C	"	"	"	"	X	X	X	X	X				
3	D	"	"	"	"	X	X	X	X	X				
4	G	"	"	"	"	X	X	X	X	X				
5	H	"	"	"	"	X	X	X	X	X				
6	I	"	"	"	"	X	X	X	X	X				
				TOTAL	12									

HT

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.

CERTIFICATE OF ANALYSIS

Work Order	: **EB2306549**	Page	: 1 of 4
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 WQM	Date Samples Received	: 06-Mar-2023 11:12
Order number	: ----	Date Analysis Commenced	: 09-Mar-2023
C-O-C number	: ----	Issue Date	: 04-May-2023 16:33
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

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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	06-Mar-2023 00:00	06-Mar-2023 00:00	06-Mar-2023 00:00	06-Mar-2023 00:00	06-Mar-2023 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**EB2306549-001**	**EB2306549-002**	**EB2306549-003**	**EB2306549-004**	**EB2306549-005**
				Result	Result	Result	Result	Result
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**56**	**7**	**8**	**9**	**12**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	I	----	----	----	----
				Sampling date / time	06-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306549-006	--------	--------	--------	--------
					Result	----	----	----	----
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		<1	**----**	**----**	**----**	**----**

QUALITY CONTROL REPORT

Work Order	: **EB2306549**	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 WQM	Date Samples Received	: 06-Mar-2023
Order number	: ----	Date Analysis Commenced	: 09-Mar-2023
C-O-C number	: ----	Issue Date	: 04-May-2023
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

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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

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Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
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LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

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- **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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP008: Chlorophyll (QCLot: 4913593)								
EP008: Chlorophyll a	----	1	mg/m³	<1	17 mg/m³	98.6	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	: **EB2306549**	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 WQM	Date Samples Received	: 06-Mar-2023
Site	: ----	Issue Date	: 04-May-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 / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EP008: Chlorophyll a & Pheophytin a						
White Plastic Bottle - Unpreserved						
A, C, D, G, H, I	----	----	----	09-Mar-2023	08-Mar-2023	**1**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, G, H, I	**06-Mar-2023**	**----**	----	**----**	**09-Mar-2023**	08-Mar-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 Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	11	**9.09**	**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.

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 46 Callemondah Drive Gladstone QLD 4680 Ph: 07 4978 7944 E: ALSEnviro.Gladstone@alsglobal.com
☐MACKAY 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
☐MUDGEE 1/29 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com
☐PERTH 26 Rigali Way Wangara WA 6065 Ph: 08 9406 1301 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 13 Carlton Street Kirwan QLD 4817 Ph: 07 4773 0000 E: ALSEnviro.Townsville@alsglobal.com
☐WOLLONGONG 1/19-21 Ralph Black Drive, Nth Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT:	LITHAQUA
OFFICE:	PEREGIAN BEACH
PROJECT:	NHH WQM
PROJECT NO.:	LPH0120
ORDER NUMBER:	—
PURCHASE ORDER NO.:	
PROJECT MANAGER:	JAMES HALL-BROWN
CONTACT PH:	0401671624
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):	lithaqua@gmail.com
Email Invoice to (will default to PM if no other addresses are listed):	"

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☑ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle): COC: 1 2 3 4 5 6 7 — OF: 1 2 3 4 5 6 7

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	
Other comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
JAMES HALL-BROWN	SP		
DATE/TIME: 6/3/23	DATE/TIME: 6/3/23 1112	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY: LAB ID	SAMPLE DETAILS MATRIX: Solid(S) Water(W): SAMPLE ID	DATE / TIME	MATRIX	CONTAINER INFORMATION: TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	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): CHLOROPHYLL A	Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	A	6/3/2023	W	P	1	X	
	C	"	"		"	X	
	D	"	"		"	X	
	G	"	"		"	X	
	H	"	"		"	X	
	I	"	"		"	X	
				TOTAL	6		

HT

Environmental Division Brisbane
Work Order Reference
EB2306549
Telephone : +61-7-3243 7222

SCANNED

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.

CERTIFICATE OF ANALYSIS

Work Order	: **EB2311617**	Page	: 1 of 4
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: 3 SHALDON STREET THE GAP QLD 4061	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	: 19-Apr-2023 09:30
Order number	: ----	Date Analysis Commenced	: 19-Apr-2023
C-O-C number	: ----	Issue Date	: 04-May-2023 16:26
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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

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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

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Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

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~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	A	C	D	F	G
			Sampling date / time	19-Apr-2023 00:00	19-Apr-2023 00:00	19-Apr-2023 00:00	19-Apr-2023 00:00	19-Apr-2023 00:00
Compound	CAS Number	LOR	Unit	EB2311617-001	EB2311617-002	EB2311617-003	EB2311617-004	EB2311617-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.57**	**7.13**	**7.24**	**7.61**	**7.40**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**170**	**28600**	**30900**	**196**	**27700**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**40.5**	**5.6**	**3.1**	**227**	**16.3**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**103**	**6**	**13**	**68**	**18**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**16.9**	**67.6**	**66.2**	**27.9**	**81.9**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	H	I	----	----	----
			Sampling date / time	19-Apr-2023 00:00	19-Apr-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2311617-006	EB2311617-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.64**	**7.79**	**----**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**12400**	**52700**	**----**	**----**	**----**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**8.2**	**7.0**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**19**	**12**	**----**	**----**	**----**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**70.3**	**84.1**	**----**	**----**	**----**

QUALITY CONTROL REPORT

Work Order	: **EB2311617**	Page	: 1 of 3
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Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH SURFACE WATER	Date Samples Received	: 19-Apr-2023
Order number	: ----	Date Analysis Commenced	: 19-Apr-2023
C-O-C number	: ----	Issue Date	: 04-May-2023
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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

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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: 5003080)									
EB2311415-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.93	7.96	0.4	0% - 20%
EB2311523-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.04	7.13	1.3	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5003584)									
EB2311617-003	D	EA005-P: pH Value	----	0.01	pH Unit	7.24	7.24	0.0	0% - 20%
EB2311615-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.31	8.32	0.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5003078)									
EB2311415-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	551	551	0.0	0% - 20%
EB2311523-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	565	574	1.6	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5003585)									
EB2311617-003	D	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	30900	30500	1.1	0% - 20%
EB2311615-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	18800	18900	0.1	0% - 20%
EA045: Turbidity (QC Lot: 5000058)									
EB2310746-001	Anonymous	EA045: Turbidity	----	0.1	NTU	16.9	16.8	0.6	0% - 20%
EB2311616-005	Anonymous	EA045: Turbidity	----	0.1	NTU	0.6	0.6	0.0	No Limit
EA045: Turbidity (QC Lot: 5000059)									
EB2311617-006	H	EA045: Turbidity	----	0.1	NTU	8.2	8.2	0.0	0% - 20%
EP025: Oxygen - Dissolved (DO) (QC Lot: 5000056)									
EB2311579-001	Anonymous	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	88.0	88.0	0.0	0% - 20%
EB2311617-002	C	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	67.6	67.6	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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5003080)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	98.8	98.0	102
				----	7 pH Unit	100	98.0	102
EA005P: pH by PC Titrator (QCLot: 5003584)								
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: 5003078)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	92.7	90.0	106
				<1	12890 µS/cm	97.4	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5003585)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	97.2	90.0	106
				<1	12890 µS/cm	99.4	90.0	106
EA045: Turbidity (QCLot: 5000058)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	101	90.0	110
				<0.1	40 NTU	102	90.0	110
				<0.1	400 NTU	102	90.0	110
EA045: Turbidity (QCLot: 5000059)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	101	90.0	110
				<0.1	40 NTU	102	90.0	110
				<0.1	400 NTU	102	90.0	110
EP008: Chlorophyll (QCLot: 5000391)								
EP008: Chlorophyll a	----	1	mg/m³	<1	17 mg/m³	108	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	: **EB2311617**	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	: 19-Apr-2023
Site	: ----	Issue Date	: 04-May-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 / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
C, F	----	----	----	24-Apr-2023	19-Apr-2023	**5**
Clear Plastic Bottle - Natural						
A, D, G, H, I	----	----	----	26-Apr-2023	19-Apr-2023	**7**
EP008: Chlorophyll a & Pheophytin a						
White Plastic Bottle - Unpreserved						
A, C, D, F, G, H, I	----	----	----	26-Apr-2023	21-Apr-2023	**5**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
C, F	**19-Apr-2023**	**----**	----	----	**24-Apr-2023**	19-Apr-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
A, D, G, H, I	**19-Apr-2023**	**----**	----	----	**26-Apr-2023**	19-Apr-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
C, F	**19-Apr-2023**	**----**	----	----	**24-Apr-2023**	17-May-2023	✓
Clear Plastic Bottle - Natural (EA010-P)							
A, D, G, H, I	**19-Apr-2023**	**----**	----	----	**26-Apr-2023**	17-May-2023	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, F, G, H, I	**19-Apr-2023**	**----**	----	----	**19-Apr-2023**	21-Apr-2023	✓
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, F, G, H, I	**19-Apr-2023**	**----**	----	----	**26-Apr-2023**	21-Apr-2023	×
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, F, G, H, I	**19-Apr-2023**	**----**	----	----	**19-Apr-2023**	19-Apr-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	4	35	**11.43**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Oxygen - Dissolved	EP025	2	7	**28.57**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	25	**12.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	4	35	**11.43**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	6	25	**24.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	25	**8.00**	**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)

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 46 Callemondah Drive Gladstone QLD 4680 Ph: 07 4978 7944 E: ALSEnviro.Gladstone@alsglobal.com
☐MACKAY 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
☐MUDGEE 1/29 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com
☐PERTH 26 Rigali Way Wangara WA 6065 Ph: 08 9406 1301 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 13 Carlton Street Kirwan QLD 4817 Ph: 07 4773 0000 E: ALSEnviro.Townsville@alsglobal.com
☐WOLLONGONG 1/19-21 Ralph Black Drive, Nth Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: LITHAQUA PTY LTD
OFFICE:
PROJECT: NHH SURFACE WATER   PROJECT NO.: LP16020
ORDER NUMBER: PURCHASE ORDER NO.:
PROJECT MANAGER: J. HALL-BROWN   CONTACT PH: 0401671624
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): lithaqua@gmail.com
Email Invoice to (will default to PM if no other addresses are listed): "

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☑ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.:
COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 6 7
OF: 1 2 3 4 5 6 7

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
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
J. HALL-BROWN	HB		
DATE/TIME: 19/4/23 920	DATE/TIME: 19/4/23 0930	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY: LAB ID	SAMPLE DETAILS MATRIX: Solid(S) Water(W): SAMPLE ID	DATE / TIME	MATRIX	CONTAINER INFORMATION: TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	pH	E.C.	DO (% ONLY)	TURBIDITY	CHLOROPHYLL-A				Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	A	19/4/23	W	P	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				
				TOTAL	14									

HT

Environmental Division
Brisbane
Work Order Reference
EB2311617

Telephone : + 61-7-3243 7222

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

CERTIFICATE OF ANALYSIS

Work Order	: **EB2314980**	Page	: 1 of 4
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	Date Samples Received	: 18-May-2023 11:20
Order number	: LP140120	Date Analysis Commenced	: 18-May-2023
C-O-C number	: ----	Issue Date	: 20-Jun-2023 13:12
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	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.

- EP008 (Chlorophyll a): For particular sample "C" (EB2314980-002), 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-May-2023 00:00	18-May-2023 00:00	18-May-2023 00:00	18-May-2023 00:00	18-May-2023 00:00
Compound	CAS Number	LOR	Unit		EB2314980-001	EB2314980-002	EB2314980-003	EB2314980-004	EB2314980-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.15**	**7.32**	**7.58**	**7.30**	**7.75**
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**172**	**359**	**286**	**180**	**22400**
EA045: Turbidity									
Turbidity	----	0.1	NTU		**32.7**	**49.3**	**27.4**	**33.0**	**10.7**
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		<1	<2	**4**	**14**	**10**
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen - % Saturation	----	0.1	% saturation		**43.4**	**48.6**	**61.8**	**34.4**	**77.2**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	H	I	----	----	----
				Sampling date / time	18-May-2023 00:00	18-May-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2314980-006	EB2314980-007	--------	--------	--------
					Result	Result	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.91**	**7.91**	**----**	**----**	**----**
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**628**	**54700**	**----**	**----**	**----**
EA045: Turbidity									
Turbidity	----	0.1	NTU		**16.9**	**2.4**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		**4**	**2**	**----**	**----**	**----**
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen - % Saturation	----	0.1	% saturation		**70.6**	**91.2**	**----**	**----**	**----**

QUALITY CONTROL REPORT

Work Order	: **EB2314980**	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	Date Samples Received	: 18-May-2023
Order number	: LP140120	Date Analysis Commenced	: 18-May-2023
C-O-C number	: ----	Issue Date	: 20-Jun-2023
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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 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*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	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%.

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: 5060412)									
EB2314990-013	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.19	8.23	0.5	0% - 20%
EB2314980-004	F	EA005-P: pH Value	----	0.01	pH Unit	7.30	7.29	0.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5060413)									
EB2314990-013	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	621	629	1.3	0% - 20%
EB2314980-004	F	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	180	181	0.0	0% - 20%
EA045: Turbidity (QC Lot: 5058238)									
EB2314950-001	Anonymous	EA045: Turbidity	----	0.1	NTU	26.6	26.5	0.4	0% - 20%
EB2314979-002	Anonymous	EA045: Turbidity	----	0.1	NTU	483	482	0.2	0% - 20%
EA045: Turbidity (QC Lot: 5058239)									
EB2314980-006	H	EA045: Turbidity	----	0.1	NTU	16.9	16.8	0.6	0% - 20%
EP025: Oxygen - Dissolved (DO) (QC Lot: 5058235)									
EB2314925-001	Anonymous	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	102	102	0.0	0% - 20%
EB2314980-003	D	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	61.8	61.8	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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5060412)								
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: 5060413)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	98.4	90.0	106
				<1	12890 µS/cm	102	90.0	106
EA045: Turbidity (QCLot: 5058238)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.2	90.0	110
				<0.1	40 NTU	98.5	90.0	110
				<0.1	400 NTU	99.0	90.0	110
EA045: Turbidity (QCLot: 5058239)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.5	90.0	110
				<0.1	40 NTU	98.5	90.0	110
				<0.1	400 NTU	99.0	90.0	110
EP008: Chlorophyll (QCLot: 5059472)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	104	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	: **EB2314980**	Page	: 1 of 5
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120	Date Samples Received	: 18-May-2023
Site	: ----	Issue Date	: 20-Jun-2023
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: LP140120	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 / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	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, D, F, G, H, I	----	----	----	24-May-2023	18-May-2023	**6**
EP008: Chlorophyll a & Pheophytin a						
Opaque Plastic Bottle - Unpreserved						
A, C, D, F, G, H, I	----	----	----	24-May-2023	20-May-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 / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		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, F, G, H, I	**18-May-2023**	**----**	----	**----**	**24-May-2023**	18-May-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, F, G, H, I	**18-May-2023**	**----**	----	**----**	**24-May-2023**	15-Jun-2023	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, F, G, H, I	**18-May-2023**	**----**	----	----	**18-May-2023**	20-May-2023	✓
EP008: Chlorophyll a & Pheophytin a							
Opaque Plastic Bottle - Unpreserved (EP008)							
A, C, D, F, G, H, I	**18-May-2023**	**----**	----	----	**24-May-2023**	20-May-2023	×
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, F, G, H, I	**18-May-2023**	**----**	----	----	**18-May-2023**	18-May-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	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Oxygen - Dissolved	EP025	2	7	**28.57**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	23	**13.04**	**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	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	6	23	**26.09**	**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	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	23	**8.70**	**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)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EB2314980**		
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	Page	: 1 of 2
Order number	: LP140120	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-May-2023 11:20	Issue Date	: 18-May-2023
Client Requested Due Date	: 25-May-2023	Scheduled Reporting Date	: **25-May-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 13.2 °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 - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 Dissolved Oxygen (DO)
EB2314980-001	18-May-2023 00:00	A	✓	✓	✓	✓	✓
EB2314980-002	18-May-2023 00:00	C	✓	✓	✓	✓	✓
EB2314980-003	18-May-2023 00:00	D	✓	✓	✓	✓	✓
EB2314980-004	18-May-2023 00:00	F	✓	✓	✓	✓	✓
EB2314980-005	18-May-2023 00:00	G	✓	✓	✓	✓	✓
EB2314980-006	18-May-2023 00:00	H	✓	✓	✓	✓	✓
EB2314980-007	18-May-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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 2-1 Burma Road Pooraka SA 5095 · MACKAY 78 Harbour Road Mackay QLD 4740 · NEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304 · SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
✓ BRISBANE 2 Byth Street Stafford QLD 4053 · MELBOURNE 2-4 Westall Road Springvale VIC 3171 · NOWRA 4/13 Geary Place North Nowra NSW 2541 · TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
GLADSTONE 46 Callemondah Drive Clinton QLD 4680 · MUDGEE 1/29 Sydney Road Mudgee NSW 2850 · PERTH 10 Hod Way Malaga WA 6090 · WOLLONGONG 99 Kenny Street Wollongong NSW 2500

Environmental Division
Brisbane
Work Order Reference
EB2314980

Telephone : + 61-7-3243 7222

CLIENT:	LITHAQUA PTY LTD
OFFICE:	PEREGIAN BEACH
PROJECT:	LP140120
PROJECT NO.:	
ORDER NUMBER:	
PURCHASE ORDER NO.:	LP140120
PROJECT MANAGER:	JAMES HALL-BROWN
CONTACT PH:	0401671624
SAMPLER:	"
SAMPLER MOBILE:	"
COC Emailed to ALS? (YES / NO)	NO (circled)
EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed):	james@lithaqua.com
Email Invoice to (will default to PM if no other addresses are listed):	"
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:	- NIL

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)
☑ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle)
COC: (1) 2 3 4 5 6 7
OF: (1) 2 3 4 5 6 7

FOR LABORATORY USE ONLY
Custody Seal Intact?
Free ice / frozen ice bricks present upon receipt?
Random Sample Temperature
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	
JAMES HALL-BROWN	SW		
DATE/TIME: 18/5/23 1125	DATE/TIME: 18/5/23 1120	DATE/TIME:	DATE/TIME:

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: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

ALS USE ONLY LAB ID	SAMPLE ID (SAMPLE DETAILS MATRIX: Solid(S) Water(W))	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	pH	E.C.	DO (% only)	Turbidity	Chlorophyll-A				Additional Information
1	A	18/5/23	W	P×2	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				HT
5	G	"	"	"	"	X	X	X	X	X				
6	H	"	"	"	"	X	X	X	X	X				
7	I	"	"	"	"	X	X	X	X	X				
				TOTAL	14	7	7	7	7	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.

Approved Date: 09/02/2018

CERTIFICATE OF ANALYSIS

Work Order	: **EB2318528**	Page	: 1 of 4
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	: 20-Jun-2023 11:55
Order number	: ----	Date Analysis Commenced	: 20-Jun-2023
C-O-C number	: ----	Issue Date	: 30-Jun-2023 12:56
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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
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	20-Jun-2023 00:00	20-Jun-2023 00:00	20-Jun-2023 00:00	20-Jun-2023 00:00	20-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2318528-001	EB2318528-002	EB2318528-003	EB2318528-004	EB2318528-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.18**	**7.29**	**7.47**	**7.08**	**7.78**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**314**	**11900**	**16600**	**248**	**41000**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**24.3**	**6.3**	**2.6**	**195**	**5.4**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**71**	**1**	**----**	**226**	**7**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**54.6**	**73.5**	**67.9**	**67.8**	**87.7**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	H	I	----	----	----
			Sampling date / time	20-Jun-2023 00:00	20-Jun-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2318528-006	EB2318528-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.56**	**7.99**	**----**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**12400**	**50200**	**----**	**----**	**----**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**14.0**	**1.8**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**2**	**2**	**----**	**----**	**----**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**63.9**	**98.7**	**----**	**----**	**----**

QUALITY CONTROL REPORT

Work Order	: **EB2318528**	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	: 20-Jun-2023
Order number	: ----	Date Analysis Commenced	: 20-Jun-2023
C-O-C number	: ----	Issue Date	: 30-Jun-2023
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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 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
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%.

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: 5124562)									
EB2318512-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.65	7.68	0.4	0% - 20%
EB2318528-005	G	EA005-P: pH Value	----	0.01	pH Unit	7.78	7.76	0.3	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5124560)									
EB2318365-034	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	809	800	1.1	0% - 20%
EB2318491-004	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	992	1040	4.6	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5124563)									
EB2318528-005	G	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	41000	40700	0.8	0% - 20%
EA045: Turbidity (QC Lot: 5123162)									
EB2318523-002	Anonymous	EA045: Turbidity	----	0.1	NTU	0.2	0.2	0.0	No Limit
EB2318556-002	Anonymous	EA045: Turbidity	----	0.1	NTU	93.3	93.2	0.1	0% - 20%
EP025: Oxygen - Dissolved (DO) (QC Lot: 5123160)									
EB2318528-001	A	EP025: Dissolved Oxygen - % Saturation	----	0.1	% saturation	54.6	54.6	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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5124562)								
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: 5124560)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	93.8	90.0	106
				<1	24800 µS/cm	99.4	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5124563)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	97.2	90.0	106
				<1	12890 µS/cm	95.9	90.0	106
EA045: Turbidity (QCLot: 5123162)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.0	90.0	110
				<0.1	40 NTU	99.8	90.0	110
				<0.1	400 NTU	98.0	90.0	110
EP008: Chlorophyll (QCLot: 5126025)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	107	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	: **EB2318528**	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	: 20-Jun-2023
Site	: ----	Issue Date	: 30-Jun-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 / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	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, D, F, G, H, I	----	----	----	22-Jun-2023	20-Jun-2023	**2**
EP008: Chlorophyll a & Pheophytin a						
White Plastic Bottle - Unpreserved						
A, C, F, G, H, I	----	----	----	23-Jun-2023	22-Jun-2023	**1**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
A, C, D, F, G, H, I	**20-Jun-2023**	**----**	----	**----**	**22-Jun-2023**	20-Jun-2023	✗
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, F, G, H, I	**20-Jun-2023**	**----**	----	**----**	**22-Jun-2023**	18-Jul-2023	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, F, G, H, I	**20-Jun-2023**	**----**	----	----	**20-Jun-2023**	22-Jun-2023	✓
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, F, G, H, I	**20-Jun-2023**	**----**	----	----	**23-Jun-2023**	22-Jun-2023	×
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, F, G, H, I	**20-Jun-2023**	**----**	----	----	**20-Jun-2023**	20-Jun-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	3	27	**11.11**	**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	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	11	**18.18**	**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	4	27	**14.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	11	**27.27**	**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	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	11	**9.09**	**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)

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 46 Callemondah Drive Gladstone QLD 4680 Ph: 07 4978 7944 E: ALSEnviro.Gladstone@alsglobal.com
☐MACKAY 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
☐MUDGEE 1/29 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com
☐PERTH 26 Rigali Way Wangara WA 6065 Ph: 08 9406 1301 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 13 Carlton Street Kirwan QLD 4817 Ph: 07 4773 0000 E: ALSEnviro.Townsville@alsglobal.com
☐WOLLONGONG 1/19-21 Ralph Black Drive, Nth Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: LITUAQUA
OFFICE: Politiquo ARACU
PROJECT: NHH SURFACE WATER PROJECT NO.: LP160121
ORDER NUMBER: PURCHASE ORDER NO.:
PROJECT MANAGER: J. HALL-BROWN CONTACT PH: 0401671626
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@LITUAQUA.COM
Email Invoice to (will default to PM if no other addresses are listed): "

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.:
COUNTRY OF ORIGIN:
COC SEQUENCE NUMBER (Circle) COC: (1) 2 3 4 5 6 7 OF: (1) 2 3 4 5 6 7

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
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
JAMES HALL-BROWN	Sw		
DATE/TIME: 20/6/23 1150	DATE/TIME: 20/6/23 11:55	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY: LAB ID	SAMPLE DETAILS MATRIX: Solid(S) Water(W): SAMPLE ID	DATE / TIME	MATRIX	CONTAINER INFORMATION: TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	pH	E.C.	D.O. (% only)	TURBIDITY	CHLOROPHYLL A				Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	A	20/6/23	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	"	"	"	"	X	X	X	X	X				
				TOTAL										

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).

Environmental Division
Brisbane
Work Order Reference
EB2318528

Telephone : + 61-7-3243 7222

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.

JWA PTY LTD
Ecological Consultants
ABN 56 066 448 879

2022 - 2023
SUMMARY OF REVEGETATION WORKS

North East Business Park

A Report Prepared for
North Harbour Holdings Pty Ltd

AUGUST 2023

JWA Pty Ltd

PO Box 650, Jimboomba QLD 4280
p 07 3219 9436 • **e** brisbane@jwaec.com.au

www.jwaec.com.au

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 (2023)
Version and Date	RW2 01/08/23
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	31/07/23	Client	1	.pdf	Email
2	RW2	FINAL	01/08/23	Client	1	.pdf	Email

Client Issue

Version	Date Sent	Author		Approved by	
		Name	Initials	Name	Initials
RW1	31/07/23	Nicole Davies	ND	Adam McArthur	AM
RW2	01/08/23	Nicole Davies	ND	Adam McArthur	AM

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TABLE OF CONTENTS

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 2023

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 improved considerably since the previous monitoring visit, however 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 improved considerably since the previous monitoring visit however, recent monitoring has identified ongoing weed maintenance is required. **PLATES 1 - 7** show aerial photos of the revegetation progress of Areas A, C and F in April 2023, compared to November 2022, December 2021, May 2021, July 2020, July 2018, and May 2012. The progress of Revegetation Area A in June 2023 is shown in **PLATES 8 & 9** compared to June 2022 (**PLATES 10 & 11**), June 2021 (**PLATES 12 & 13),** July 2020 (**PLATES 14 & 15**) and July 2018 (**PLATES 16 & 17)**.

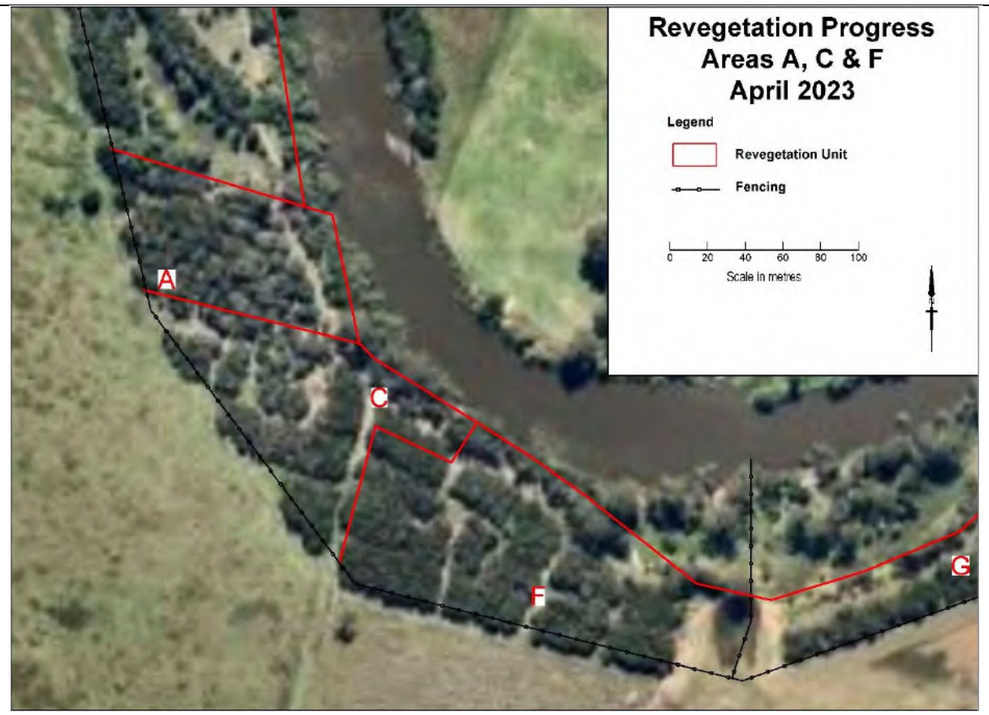

PLATE 1: Aerial of Revegetation progress of Areas A, C and F – April 2023

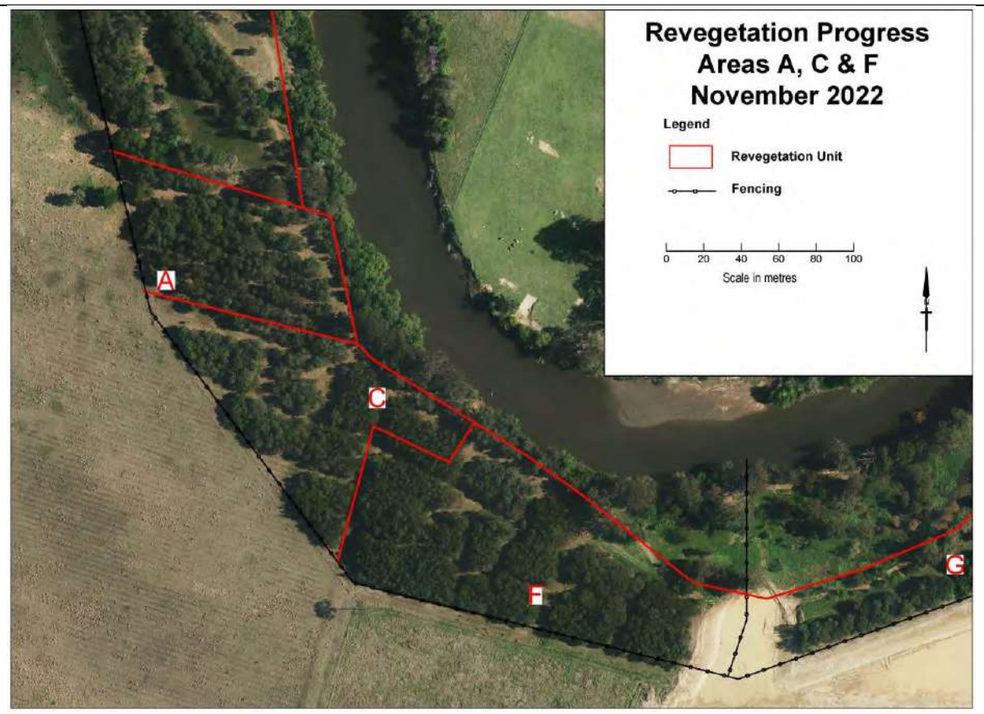

PLATE 2: Aerial of Revegetation progress of Areas A, C and F – November 2022

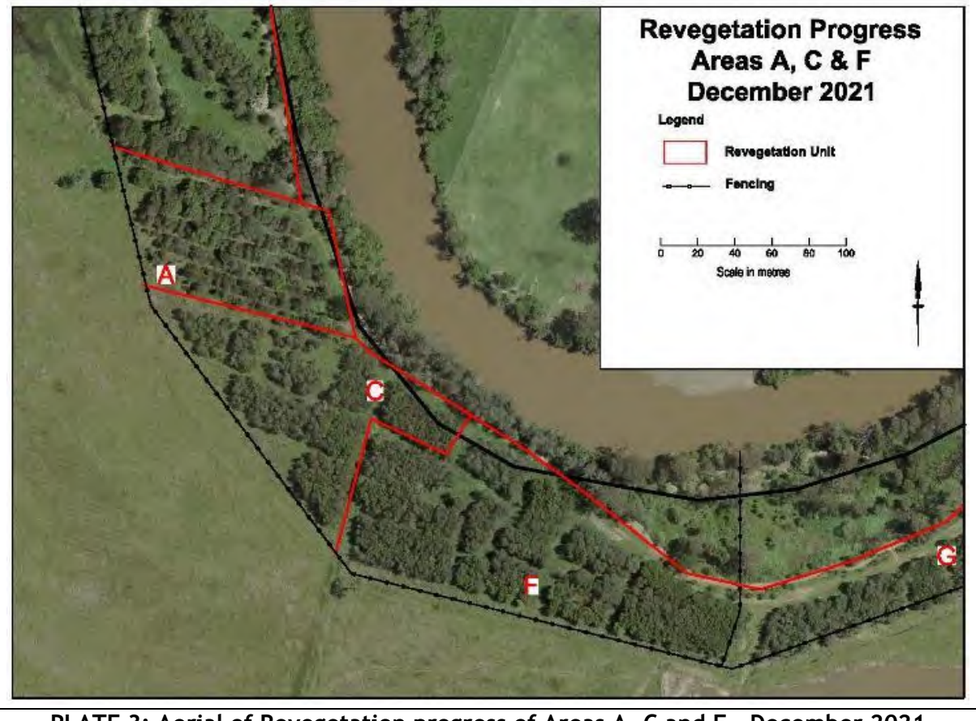

PLATE 3: Aerial of Revegetation progress of Areas A, C and F – December 2021

PLATE 4: Aerial of Revegetation progress of Areas A, C and F – May 2021

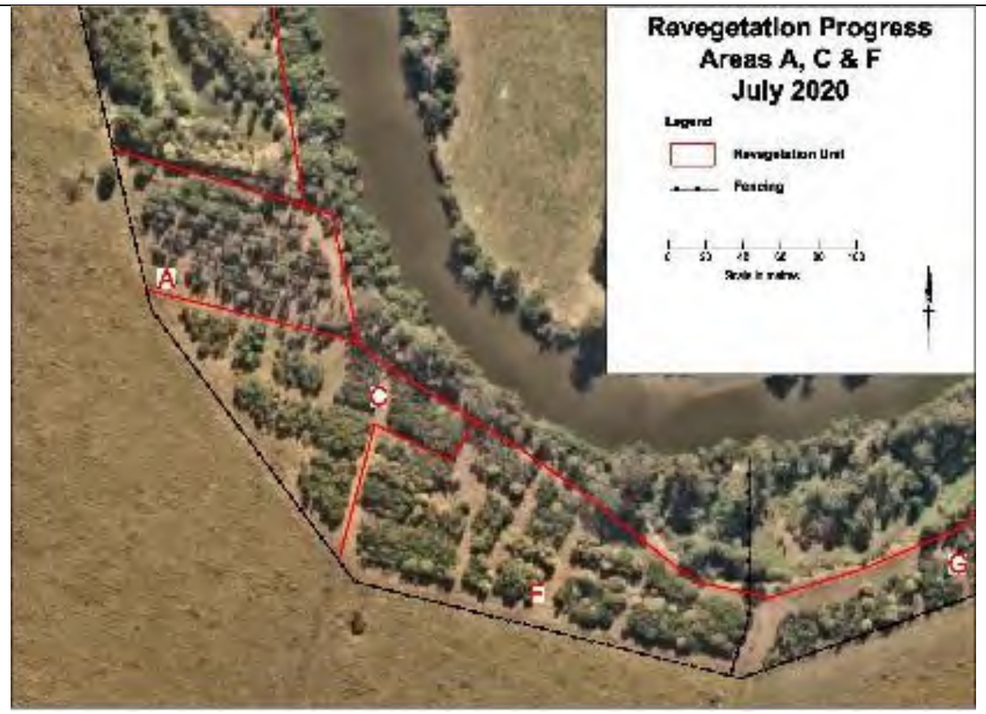

PLATE 5: Aerial of Revegetation progress of Areas A, C and F – July 2020

PLATE 6: Aerial of Revegetation progress of Areas A, C and F – July 2018

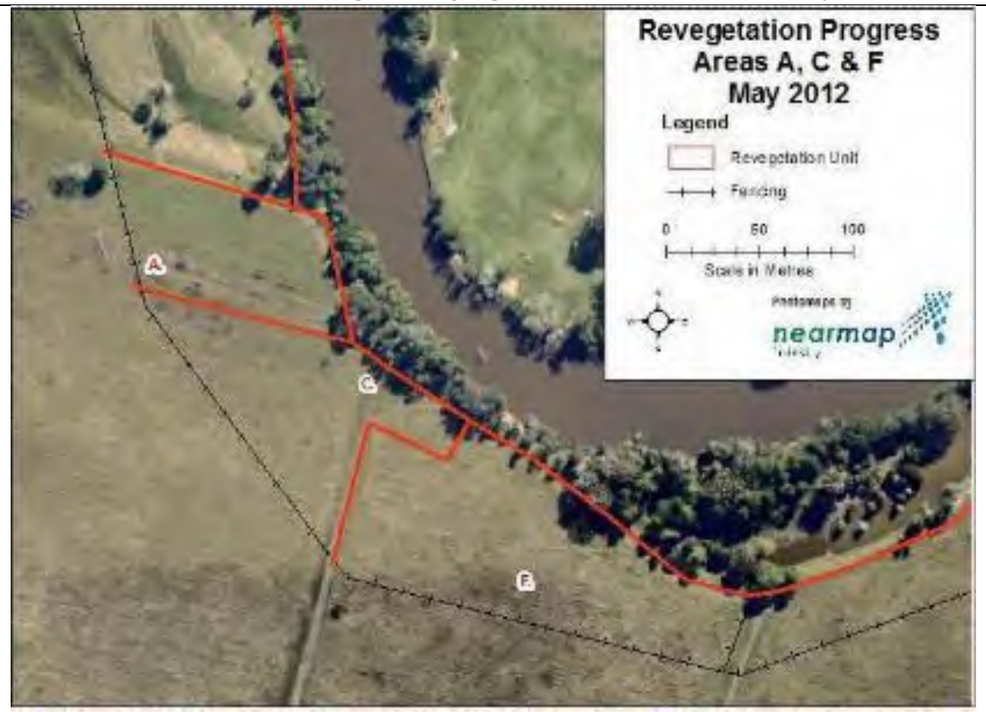

PLATE 7: Aerial of Revegetation progress of Areas A, C and F – May 2012

PLATE 8: Revegetation Area A June 2023

PLATE 9: Revegetation Area A June 2023

PLATE 10: Revegetation Area A June 2022

PLATE 11: Revegetation Area A June 2022

PLATE 12: Revegetation Area A June 2021

PLATE 13: Revegetation Area A June 2021

PLATE 14: Revegetation Area A July 2020

PLATE 15: Revegetation Area A July 2020

	
PLATE 16: Revegetation Area A July 2018	**PLATE 17: 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 improved considerably since the previous monitoring visit however, follow-up weed maintenance is required in some parts of Area C. **PLATES 1 - 7** show aerial photos of the revegetation progress of Areas A, C and F in April 2023 compared to November 2022, December 2021, May 2021, July 2020, July 2018, and May 2012. The progress of Revegetation Area C in June 2023 is shown in **PLATE 18** compared to June 2022 (**PLATE 19**), June 2021 (**PLATE 20**), July 2020 (**PLATE 21**) July 2018 (**PLATE 22**) and June 2017 (**PLATE 23**).

PLATE 18: Revegetation Area C June 2023

PLATE 19: Revegetation Area C June 2022

PLATE 20: Revegetation Area C June 2021

PLATE 21: Revegetation Area C July 2020

	
PLATE 22: Revegetation Area C July 2018	**PLATE 23: 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 improved considerably since the previous monitoring visit however, recent monitoring has identified ongoing weed maintenance is required. Of particular concern was the presence of Lantana (*Lantana camara*), a Weed of National Significance (WoNS). **PLATES 1 - 7** show aerial photos of the revegetation progress of Areas A, C and F in April 2023 compared to November 2022, December 2021, May 2021, July 2020, July 2018, and May 2012. The progress of Revegetation Area F in June 2023 is shown in **PLATE 24** compared to June 2022 (**PLATE 25**), June 2021 (**PLATE 26**), July 2020 (**PLATE 27),** July 2018 (**PLATE 28**) and June 2017 (**PLATE 29**).

PLATE 24: Revegetation Area F June 2023

PLATE 25: Revegetation Area F June 2022

PLATE 26: Revegetation Area F June 2021

PLATE 27: Revegetation Area F July 2020

	
PLATE 28: Revegetation Area F July 2018	**PLATE 29: 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 improved considerably since the previous monitoring visit however, recent monitoring has identified ongoing weed maintenance is required. **PLATES 30-36** show aerial photos of the revegetation progress of Area B in April 2023 compared to November 2022, December 2021, May 2021, July 2020, July 2018, and May 2012. The progress of Revegetation Area B in June 2023 (**PLATES 37 & 38**) compared to June 2022 (**PLATES 39 & 40**), June 2021 (**PLATES 41 & 42),** July 2020 (**PLATE 43 & 44**) and July 2018 (**PLATES 45 & 46**).

PLATE 30: Aerial of Revegetation progress of Area B – April 2023

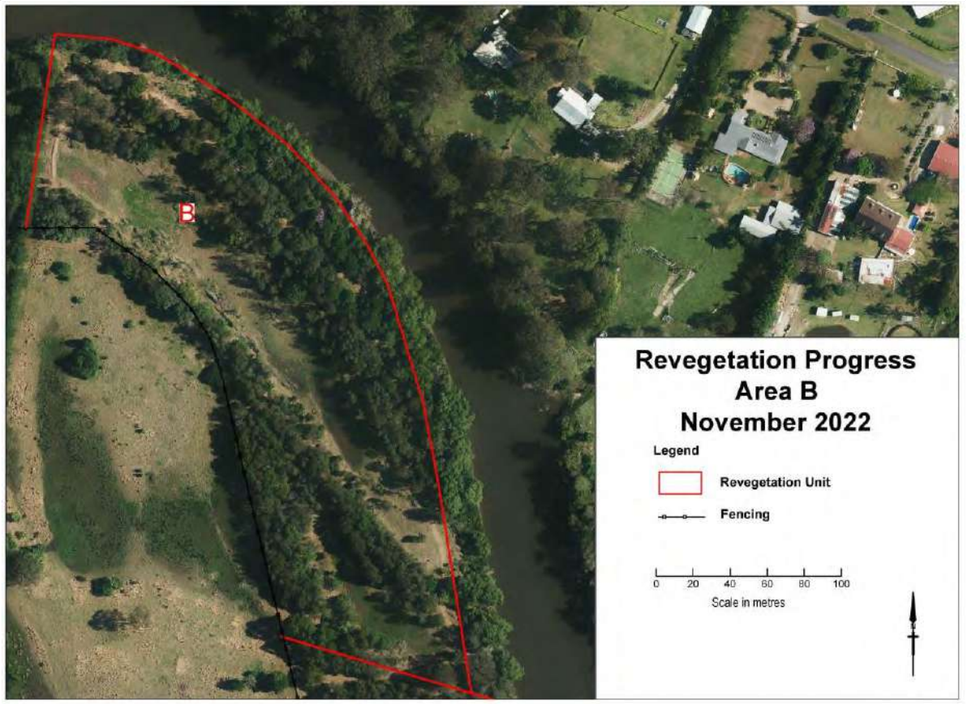

PLATE 31: Aerial of Revegetation progress of Area B – November 2022

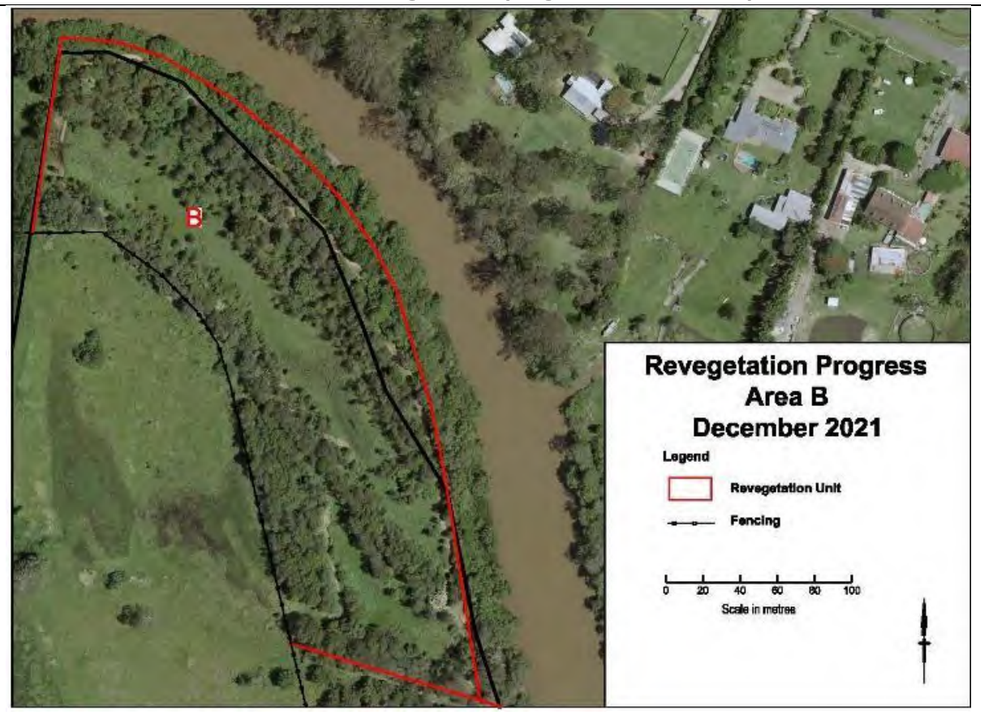

PLATE 32: Aerial of Revegetation progress of Area B – December 2021

PLATE 33: Aerial of Revegetation progress of Area B – May 2021

PLATE 34: Aerial of Revegetation progress of Area B – July 2020

PLATE 35: Aerial of Revegetation progress of Area B – July 2018

PLATE 36: Aerial of Revegetation progress of Area B – May 2012

PLATE 37: Revegetation Area B June 2023

PLATE 38: Revegetation Area B June 2023

PLATE 39: Revegetation Area B June 2022

PLATE 40: Revegetation Area B June 2022

PLATE 41: Revegetation Area B June 2021

PLATE 42: Revegetation Area B June 2021

PLATE 43: Revegetation Area B July 2020

PLATE 44: Revegetation Area B July 2020

	
PLATE 45: Revegetation Area B July 2018	**PLATE 46: 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 47 - 53** show aerial photos of the revegetation progress of Area G in April 2023 compared to November 2022, December 2021, May 2021, July 2020, July 2018, and May 2012. The progress of Revegetation Area C in June 2023 (**PLATE 54**) compared to June 2022 (**PLATE 55**), June 2021 (**PLATE 56),** July 2020 (**PLATE 57)**, July 2018 (**PLATE 58**) and June 2017 (**PLATE 59**).

PLATE 47: Aerial of Revegetation progress of Area G – April 2023

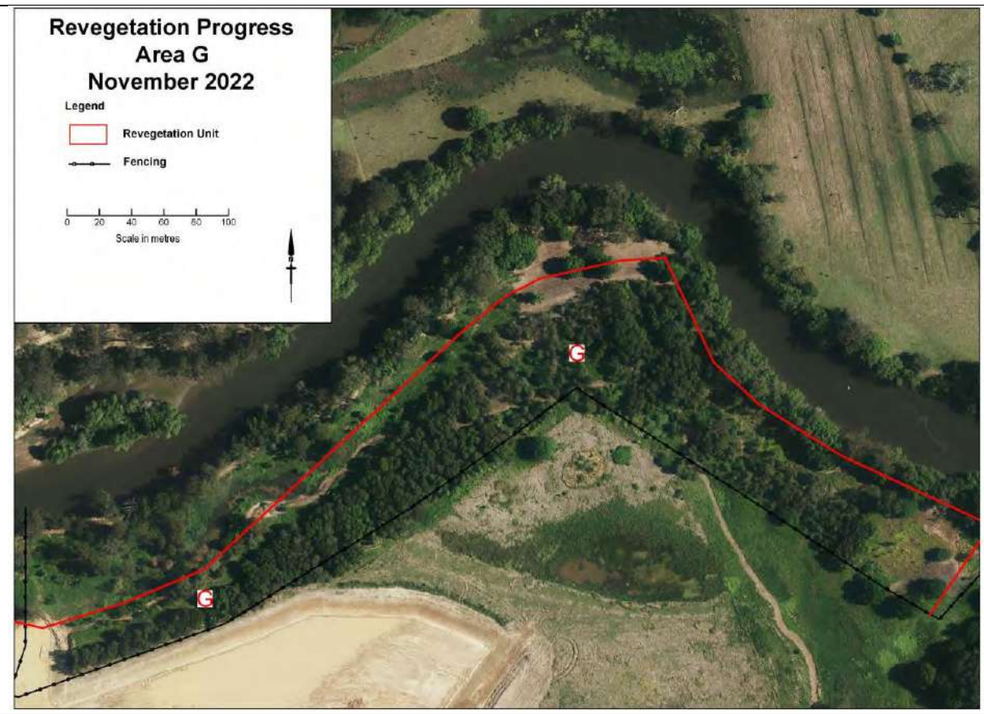

PLATE 48: Aerial of Revegetation progress of Area G – November 2022

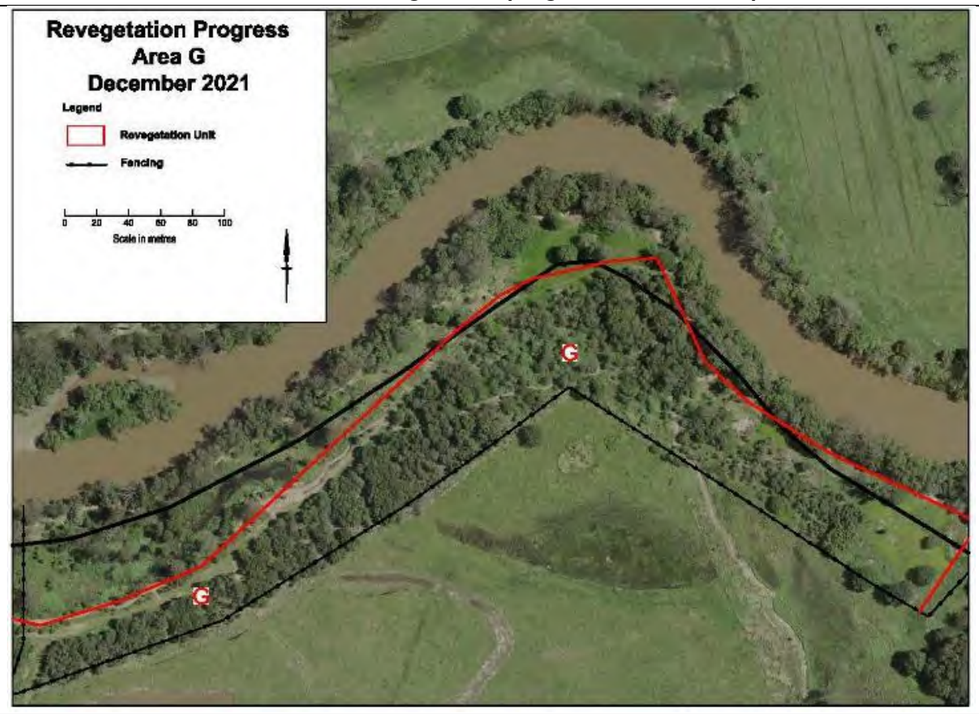

PLATE 49: Aerial of Revegetation progress of Area G – December 2021

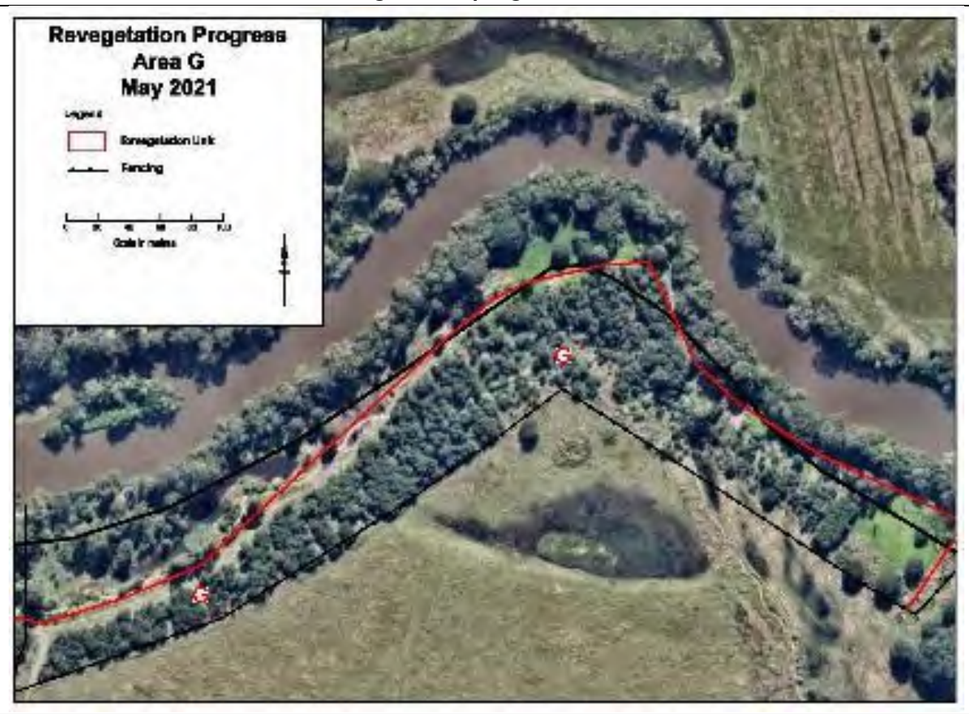

PLATE 50: Aerial of Revegetation progress of Area G – May 2021

PLATE 51: Aerial of Revegetation progress of Area G – July 2020

PLATE 52: Aerial of Revegetation progress of Area G – July 2018

PLATE 53: Aerial of Revegetation progress of Area G – May 2012

PLATE 54: Revegetation Area G June 2023

PLATE 55: Revegetation Area G June 2022

PLATE 56: Revegetation Area G June 2021

PLATE 57: Revegetation Area G July 2020

	
PLATE 58: Revegetation Area G July 2018	**PLATE 59: 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. **PLATES 60 - 66** show aerial photos of the revegetation progress of Area H in November 2022 compared to December 2021, May 2021, July 2020, July 2018, and May 2012. The progress of Revegetation Area H in June 2023 (**PLATES 67 & 68**) compared to June 2022 (**PLATES 69 & 70**), June 2021 (**PLATES 71 & 72**), July 2020 (**PLATES 73 & 74**), July 2018 (**PLATES 75 & 76**).

PLATE 60: Aerial of Revegetation progress of Area H – April 2023

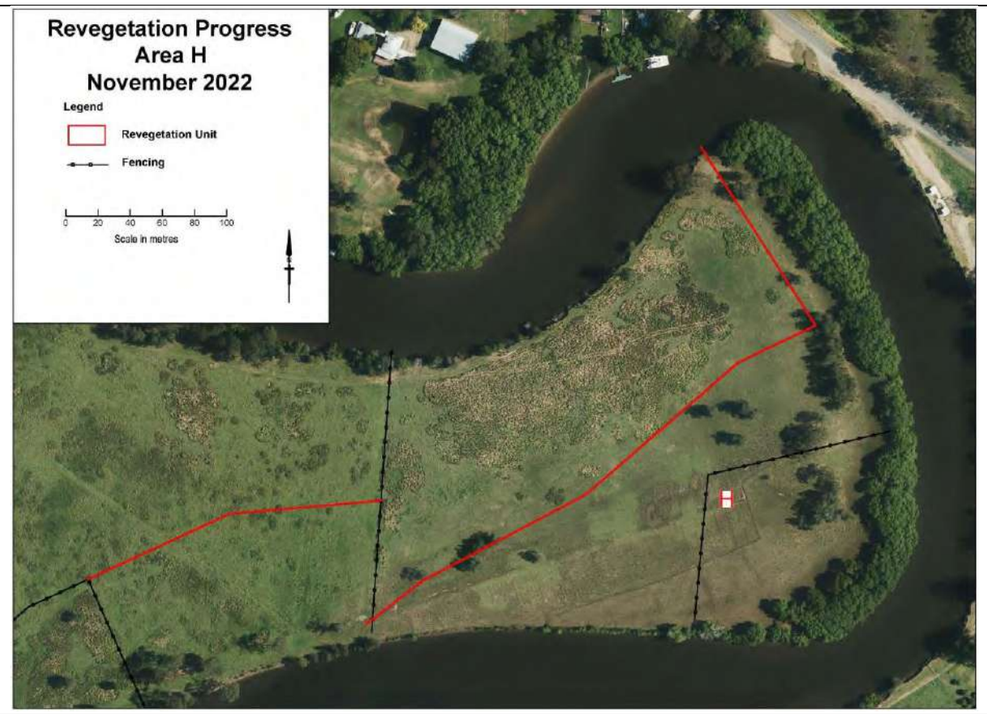

PLATE 61: Aerial of Revegetation progress of Area H – November 2022

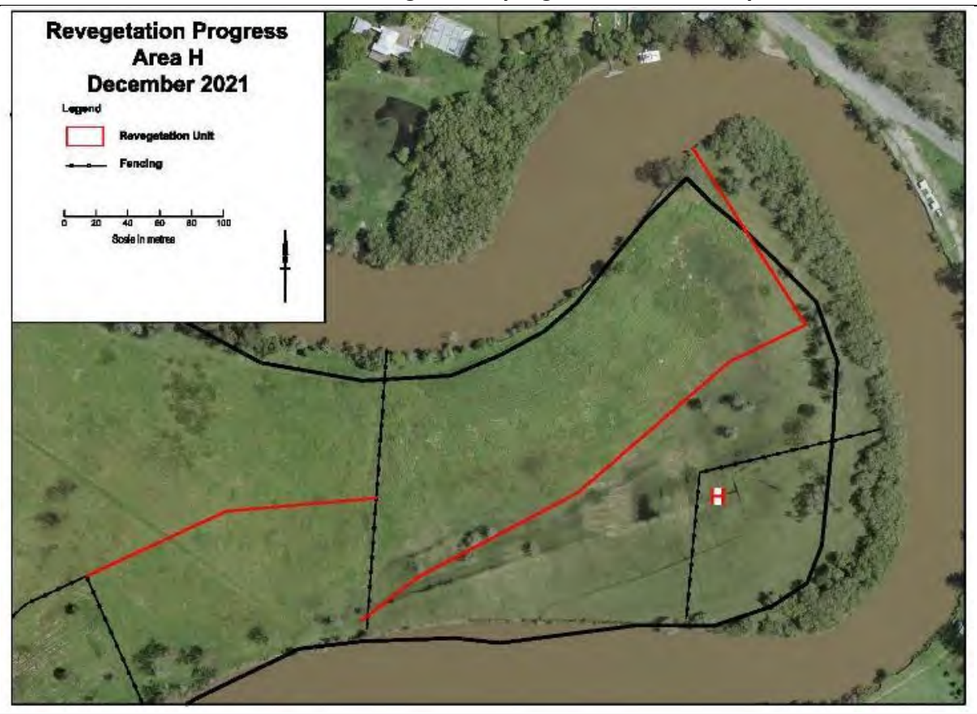

PLATE 62: Aerial of Revegetation progress of Area H – December 2021

PLATE 63: Aerial of Revegetation progress of Area H – May 2021

PLATE 64: Aerial of Revegetation progress of Area H – July 2020

PLATE 65: Aerial of Revegetation progress of Area H – July 2018

PLATE 66: Aerial of Revegetation progress of Area H – May 2012

PLATE 67: Revegetation Area H June 2022

PLATE 68: Revegetation Area H June 2022

PLATE 69: Revegetation Area H June 2022

PLATE 70: Revegetation Area H June 2022

PLATE 71: Revegetation Area H June 2021

PLATE 72: Revegetation Area H June 2021

PLATE 73: Revegetation Area H July 2020

PLATE 74: Revegetation Area H July 2020

	
PLATE 75: Revegetation Area H July 2018	**PLATE 76: Revegetation Area H July 2018**

11 Photo Point Monitoring

Photo Point Monitoring has continued in the 2017 – 2018, 2019 – 2020, 2020 – 2021, 2021-2022 and 2022-2023 period. 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 77** provides a plan showing the location of each Photo Point.

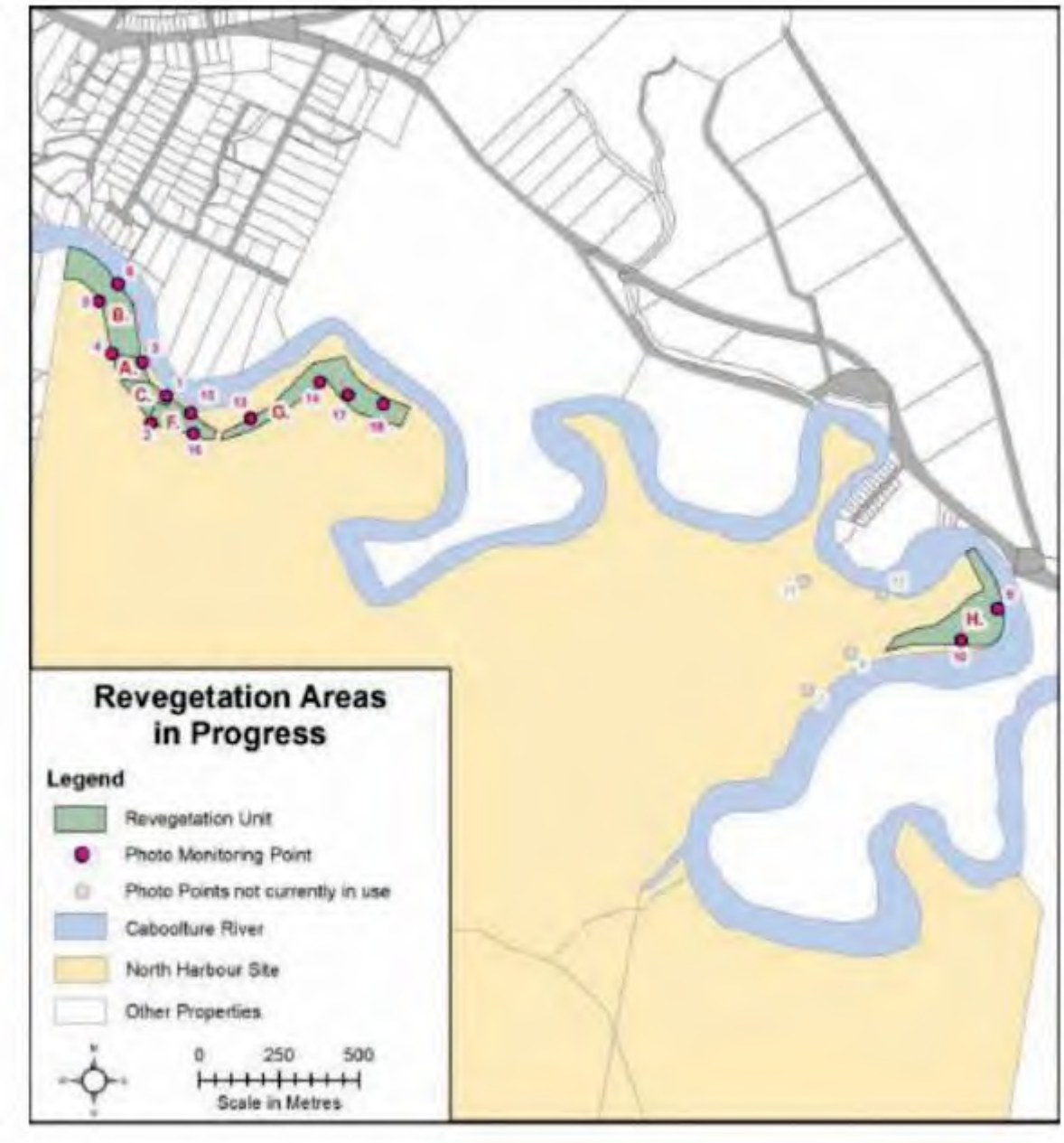

PLATE 77: Revegetation Areas in Progress.

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

PHOTO POINT 2: Revegetation Area F. Some exotic grasses, Brazilian nightshade (*Solanum seaforthianum*), Lantana (*Lantana camara*), Balloon cotton bush (*Gomphocarpus physocarpus)* and Easter cassia (*Senna pendula var. glabrata*) within revegetation area – to be controlled by ongoing weed management. There was evidence of recent weed control with cattle grazing.

PHOTO POINT 3: Revegetation Area A. Some exotic grasses, Lantana (*Lantana camara*), Brazilian nightshade (*Solanum seaforthianum*) and Wild tobacco (*Solanum mauritianum*) 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 - 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*), Easter cassia (*Senna pendula var glabrata*), Rattlepod (*Crotalaria lanceolata*), Wild tobacco (*Solanum mauritianum*), and Devil's fig (*Solanum chrysotrichum*) growing within revegetation area - to be controlled by ongoing weed management. There was evidence of recent weed control with cattle grazing.

PHOTO POINT 6: Revegetation Area B. Mile-a-minute (*Ipomoea cairica*), Blue billygoat weed (*Ageratum houstonianum*), Broadleaved pepper tree (*Schinus terebinthifolia*), Easter cassia (*Senna pendula var glabrata*), Wild tobacco (*Solanum mauritianum*), and Devil's fig (*Solanum chrysotrichum*) growing within revegetation area - to be controlled by ongoing weed management. There was evidence of recent weed control with cattle grazing.

PHOTO POINT 9: Revegetation Area H.

PHOTO POINT 10: Revegetation Area H.

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

PHOTO POINT 15: Revegetation Area F. Some pasture grasses, Lantana (*Lantana camara*), Glycine (*Neonotonia wightii*), Wild tobacco (*Solanum mauritianum*), 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 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, Balloon cottonbush, Thistles, Wild tobacco - to be controlled by ongoing weed management.

PHOTO POINT 18: Revegetation Area G. Singapore daisy, Mile-a-minute, Wild tobacco, Lantana throughout area - to be controlled by ongoing weed management.

156-HC2208-D

FAUNA POST-CLEARANCE REPORT

NORTH HARBOUR
93 BUCKLEY ROAD
BURPENGARY EAST, QUEENSLAND

Prepared for client:
HALL CONTRACTING

Date:
19th September 2022

AWEC
ENVIRONMENTAL
CONSULTANTS

Document Prepared by:

Australia Wide Environmental Consultants
ABN 67 618 756 291
33 Ballantyne Court
Glenview
Queensland 4553 Australia
T: 0458 293 759
E: admin@awenv.com.au

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1					
2					

Document Approval

Approved:	Name:	Signature:	Date:
Company Director	Yolande Venter		NOV 2022

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 INTRODUCTION

1.1 Background

Australia Wide Environmental Consultants (AWEC) were commissioned by Hall Contracting to manage fauna during clearing works for the continued development of North Harbour, along Buckley Road, Burpengary East, Queensland.

The entire project is approximately 122 Ha, with multiple stages of residential subdivision (FIGURE 1). Most of the project site has already been cleared and developed, this report includes two areas of remaining vegetation: a narrow strip along the Southern edge and a patch at the end of Buckley Rd, in the Northeast of the development (FIGURE 2).

1.2 Ecologist and Qualifications

The AWEC nominated Ecologist is Yolande Venter who is a degree qualified ecologist/environmental coordinator with over 15 years of field experience within the ecology and environmental sectors.

1.3 Scope

A. See TABLE 1 for a non-exhaustive list of the statutory requirements and guidelines this project adheres to.

B. A desktop review of the site's potential ecological value and any planning constraints.

C. A site inspection which included ground truthing the desktop review findings and a fauna survey.

D. Management measures to control the risk to native fauna during these works.

FIGURE 1– DEVELOPMENT LAYOUT

2 STATUTORY REQUIREMENTS AND GUIDELINES

See TABLE 1 below for the relevant statutory requirements and guidelines.

TABLE 1– STATUTORY REQUIREMENTS AND GUIDELINES

Legislation	Purpose of Legislation	Impact on Project personnel
Environmental Protection Regulation 2019	Gives legislative support to various national guidelines, plans and Australian Standards. This regulation also outlines requirements for the management of fauna and flora.	To abide by the regulations within the DES.
Environmental Protection and Biodiversity Conservation Act 1999	The EPBC Act 1999 focuses Australian Government interests on the protection of matters of national environmental significance, with the states and territories having responsibility for matters of state and local significance.	To comply with the relevant sections of the Act that relate to matters of national significance which are present in the vicinity of the project works.
Nature Conservation and Other Legislation Amendment Act 2016	The Act provides for the legislative protection of Queensland's threatended biota. It is aligned with the IUCN redlist which categorises biota into their current status in the wild.	To comply with the relevant sections of the Act and regulations and the Environmental Authority administered by the DES.
Nature Conservation (Wildlife) Regulation 2006	This Regulation lists the plants and animals considered presumed extinct, endangered, vulnerable, rare, common, international, and prohibited. It discusses their significance and states the declared management intent and the principles to be observed in any taking and use for each group.	List those animals that may be potentially found on sites being developed as part of the project and limitations for management.
Nature Conservation (Wildlife Management) Regulation 2006	This Regulation provides for the management of wildlife (including taking, keeping and using wildlife including protected plants).	Provides guidance for the management of wildlife on site, particularly in relation to the interference with native wildlife during the clearing process.
Nature Conservation and Other Legislation (Koala Protection) Amendment Regulation 2020	Guideline for identifying and managing Koala habitat	Provides guidance on where Koala spotter/ Endorsed FSC are legally required and how they are to manage Koala habitat.

Legislation	Purpose of Legislation	Impact on Project personnel
Animal Care and Protection Act 2001	Animal Welfare	Outlines that animal ethics approval is needed for research, survey and/or monitoring involving vertebrates, where activities such as trapping, census leading to disturbance of animals (such as spotlighting or call play-back), abnormal interruption of behaviour or marking/tagging are involved.
Australian code for the care and use of animals for scientific purposes 8th edition (2013)	Ethical framwork for animals used for scientific purposes	Governing principles set out in the Code provide guidance for investigators, teachers, institiutions, animal ethics committees and all the people involved in the care and use of animals for scientific purposes.
Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (2018)	Guidelines for Fauna Surveys	Detailed guidelines on designing a survey, the different survey methadologies and the ethical considerations that need to be made for each methadology.
Queensland Hygiene protocol for handling amphibians	Protocol for handling amphibian species	Outlines how to handle and manage amphibian species to prevent the spread of diseases among specimens and colonies.
Code of Practice- Care and rehabilitation of orphaned, sick or injured protected animals by wildlife carers(2013)	Provides guidelines on the rehabilitation and care of wildlife	Detailed guidelines, in regards to hygiene, housing, capture and release, euthanasia and relevant legistation
Seqwater- Guideline- Fish Stranding and Salvage	The purpose of this guidance document is to ensure native fish recovery operations are conducted in a timely and safe manner to minimise or eliminate loss of fish from stranding.	Guideline on managing aquatic fauna during dewatering works.

Legislation	Purpose of Legislation	Impact on Project personnel
Fisheries Act 1994	The main purpose of the *Fisheries Act 1994* is to provide for the use, conservation and enhancement of the community's fisheries resources and fish habitats in a way that seeks to apply the principles of ecologically sustainable development.	Outlines fish habitats and fish movement and migration (regulation of waterway barriers). Guidelines on commercial, recreational and indigenous fishing.
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.	Under the *Biosecurity Act 2014*, pest species must not be kept, fed, given away, sold, or released into the environment without a permit. Under the *Biosecurity Act 2014*, everyone has a general biosecurity obligation (GBO) to take reasonable and practical steps to minimise the risks associated with restricted plants and animals.
DAF Guidelines for Fish Salvage, 2018	Purpose of these guidelines is to minimise the risk to aquatic fauna during dewatering works.	These guidelines provide detailed instructions for dewatering waterbodies and slavaging aquatic fauna.

Australia Wide Environmental Consultants (AWEC) holds a current DES rehabilitation permit (Permit #WA0027769), with an extended authority issued by the Department of Environment and Science specifying that the holder may take, keep, or use an animal whose habitat is about to be destroyed by human activity.

3 METHODOLOGY

3.1 Desktop Review

Prior to commencing the survey, all previous surveys and management plans related to the site were reviewed, as well as extensive desktop research of the intended site.

The results of the desktop review allowed the survey to be designed to target the significant species most likely to be encountered within the proposed survey location. Benefits of the desktop review prior to commencing the survey included: Increased knowledge of the site by understanding;

- The overall habitat value,
- Range of habitat features,
- Floral structural complexity,
- Available water and food sources.

3.1.1 Regulated Vegetation Management

Land clearing in Queensland is regulated under the *Land Act 1994* and the vegetation management framework. To ensure this site will not have detrimental environmental impacts to the local biodiversity appropriate vegetation mapping was viewed on Queensland Globe. The vegetation management regional ecosystem layer was used to establish the Regional Ecosystems (REs) on site.

3.1.2 Koala Habitat Planning and Management

Nature Conservation and Other Legislation (Koala Protection) Amendment Regulation 2020 is an overarching state planning instrument that regulates new development at the development assessment stage. The new Koala planning framework is based upon scientifically based, consistent Koala habitat mapping. The framework applies consistently across SEQ and establishes where clearing may be prohibited, where it is assessable by the State, where Koala conservation outcomes will be considered by local governments and what exemptions may apply.

The Koala Plan layer was viewed on Queensland globe to establish koala habitat areas.

3.1.3 Significant Fauna Species List

A species list was collated by a suitably qualified ecologist, sourced from the Queensland Government WildNet Database (2021). This established the significant species with confirmed sighting records since 1980, within a 2 km radius of the central coordinates of the site.

3.2 Survey Planning

The survey methodology considered the following aspects:

- Size of the survey site
- Timeframes
- Access
- Workplace Health & Safety
- EVNT Native species confirmed- terrestrial/ arboreal
- Feral species
- Complexity of potential breeding places
- Marking of potential habitat features.

The methodology used for this survey was the active diurnal search methodology incorporating a meandered pattern. This method was suitable for the large survey area with complex habitat and time constraints.

The main objective of this survey was to locate any active or potential native fauna breeding places and high value habitat features.

The extent was surveyed by a suitably qualified person.

The number of meanders completed depended on the vegetation community and the number of habitat features present within the site. During the survey, photographs of unidentified scat, tracks and signs were taken, researched, peer reviewed, and identified using the appropriate reference materials.

3.3 Pre-Clearance Survey

Site was surveyed by a suitably qualified ecologist on 16th August 2022 which included ground-truthing via meandering transects.

The purpose of the survey is to record the sites overall habitat value, significant habitat features, vegetation connectivity within the site and surrounding lots, fauna signs and opportunistic fauna sightings and the site's suitability for the significant species likely to occur in the area.

A thorough aural/visual fauna survey was conducted including a systematic traverse throughout the site searching for fauna individuals and habitat features.

The following habitat features are considered significant and were recorded if observed:

- Tree hollows (branch and crown)
- Native wildlife nests (stick nests)
- Burrows (feeding burrows)
- Fallen/felled timber
- Thick groundcover
- Fissured bark
- Rocky outcrops

- Aquatic habitat
- And flora species considered Koala habitat trees under the *Nature Conservation and Other Legislation (Koala Protection) Amendment Regulation 2020*.

3.4 Fauna Survey Methods

The methods presented below were as part of the fauna field survey:

3.4.1 Animal Signs

Some native wildlife leave scat, tracks and scratches that can be identified and are described by Barbara Triggs (2004). These indicators should be used to provide evidence for identification without an actual physical sighting.

3.4.2 Diurnal Avian Survey

This non-intrusive active area search provides a census of the avian biodiversity and abundance within the survey site. This survey technique requires a skilled observer with relevant experience in local bird species and bird calls. Site transects are traversed slowly shortly after dawn when birds are most active. Avoid disturbing nesting birds during the survey.

3.4.3 Koala Survey

The Spot Assessment Technique was undertaken, as recommended in the EPBC Act 1999 Referral Guidelines for the Endangered Koala (DoE 2013). This technique involved faecal pellet searches of a 100 cm radius around selected trees at each Spot Assessment Technique site. The method applied was varied from that described in Phillips and Callaghan (2011), by randomly selecting the centre tree (from a randomly generated location) and searching under both potential food and shelter trees (i.e., not limited to trees of the *Eucalyptus*, *Corymbia*, *Angophora* or *Lophostemon* genera), based on evidence presented in Woosnam-Merchez *et al.* (2012).

Note: During the fauna pre-clearance survey smooth bark trees were examined for scratch marks, in the event Koala scratch marks were evident this assessment technique was conducted and data logged.

3.5 Emergency Procedures

During the trapping and construction phases it is likely that injured or sick wildlife will be encountered onsite. Local carers and veterinarians contact details should be always available. Moreover, all staff conducting trapping should be trained in the emergency first aid of native wildlife and carry the required first aid equipment to stabilise native fauna for transport and correct transportation cages. All sick and orphaned wildlife will be taken to the Australia Zoo Wildlife Hospital, 1638 Steve Irwin Way, Beerwah, (07) 5436 2097 or RSPCA Wildlife Hospital, 139 Wacol Station Road, Wacol, (07) 3426 9999.

4 RESULTS

4.1 Desktop Review

4.1.1 Regulated Vegetation Management

Vegetation within the clearing footprint is predominantly non-remnant, with a small section of high value regrowth mapped along the Southern edges of the Southern area. These are RE 12.5.3 (Endangered and suitable Koala habitat) and RE 12.3.5 (Least Concern). (FIGURE2 and TABLE 2). No RE's are mapped within the Northern clearing extent.

TABLE 2 – REGIONAL ECOSYSTEMS

RE	VM Act Status	Short Description
12.5.3	Endangered	*Eucalyptus racemosa subsp. racemosa* woodland with *Corymbia intermedia, E. siderophloia +/- E. tindaliae, E. resinifera, E. pilularis, E. microcorys, Angophora leiocarpa. Melaleuca quinquenervia* is often a prominent feature of lower slopes. Minor patches (<1ha) dominated by *Corymbia citriodora subsp. variegata* sometimes occur. Occurs on complex of remnant Tertiary surfaces +/- Cainozoic and Mesozoic sediments. Potential habitat for NCA listed species: *Allocasuarina emuina, Eucalyptus curtisii, Leptospermum oreophilum*. This ecosystem is known to provide suitable habitat for Koala's.
12.3.5	Least Concern	*Melaleuca quinquenervia* open forest on coastal alluvium. Habitat for threatened flora species including *Phaius australis* and *P. bernaysii*. Habitat for threatened fauna including the wallum froglet (*Crinia tinnula)*. This ecosystem is known to provide suitable habitat for Koala's.

4.1.2 Koala Habitat Planning and Management

The area mapped as RE 12.5.3 is also mapped as Core Koala Habitat (FIGURE 4).

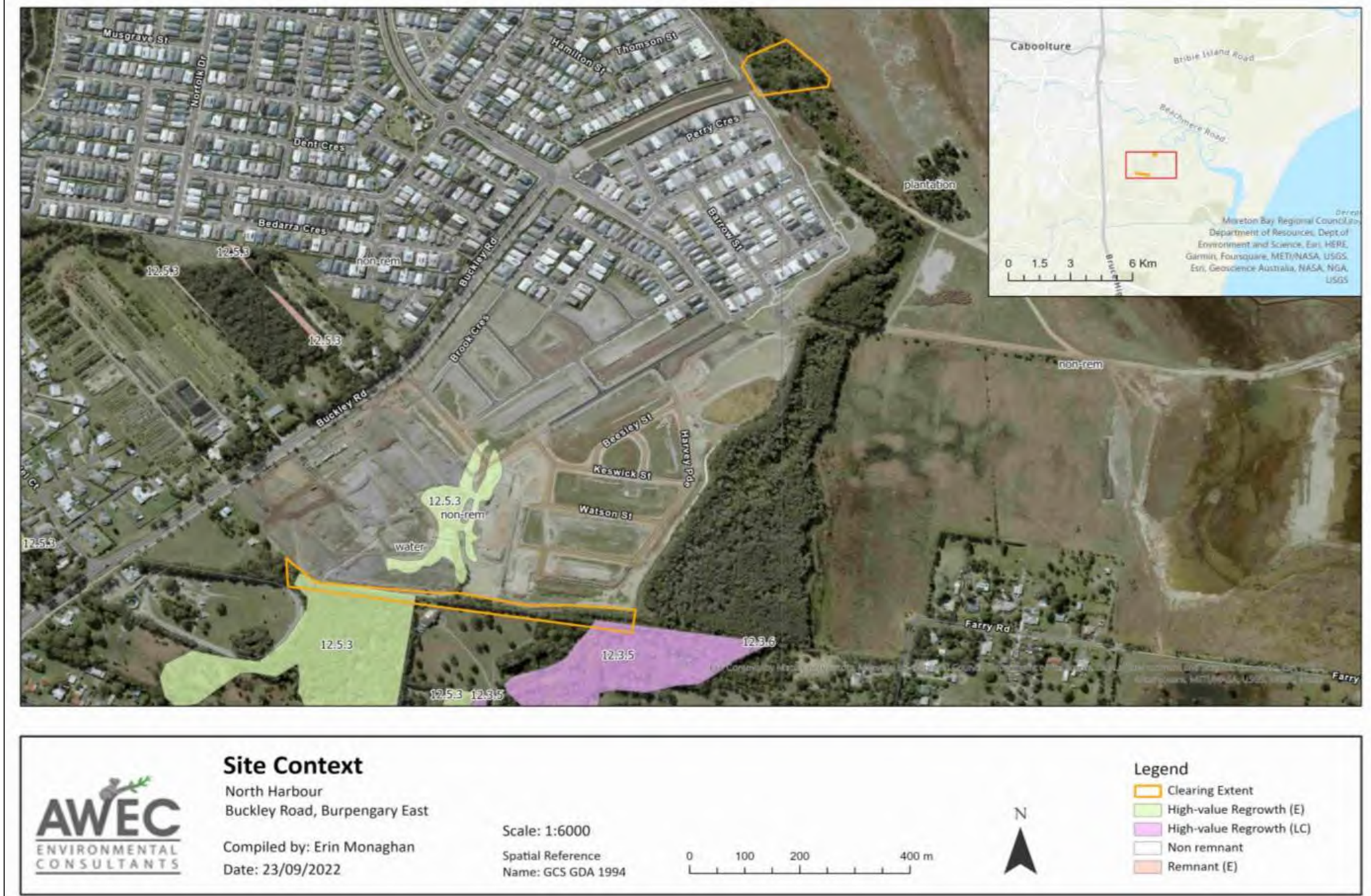

FIGURE 2- SITE CONTEXT

KOALA HABITAT MAP

PRO- 293 BUCKLEY RD., BURPENGARY EAST, QLD

CLIENT: HALL

PREPARED BY: AWEC ENVIRONMENTAL CONSULTANTS

COMPILED BY: AC	DATE: 16/08/2022
APPROVED BY: YV	DATE: 16/08/2022

LEGEND:

- SURVEY EXTENT
- CORE KOALA HABITAT
- EASEMENT PARCELS
- WATERWAYS
- LOT BOUNDARIES
- ROADS

A product of Queensland Globe

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FIGURE 3 – KOALA HABITAT MAP

4.1.1 Significant Species

This database provided a list of fauna species previously recorded in the area, of which included 2 Vulnerable, 2 Special Least Concern and 1 Endangered species (Error! Reference source not found.).

The assessment of the likelihood of each species' occurrence on site was determined from the desktop assessment and field surveys. The assessment of the likelihood of each species' occurrence on site was determined from the desktop assessment and field surveys and classified as 'low', 'moderate' and 'high'.

There is aquatic habitat on site which would be appropriate for the wallum sedgefrog, therefore there is a moderate chance for encountering this species and particular attention should be paid for this species. The remaining significant species are unlikely to be encountered but caution should still be taken.

PRE-CLEARANCE REPORT
North Harbour, 293 Buckley Road, Burpengary East, Queensland

Field Guide for Significant Species likely to be encountered on site

These animals were returned in a WildNet search for a 2 km radius of the site.

TABLE 3 - SIGNIFICANT SPECIES

Wallum sedgefrog (*Litoria olongburensis*)

Handle with care if relocating, following Amphibian Handling Protocol

NC Act 1992: VULNERABLE
EPBC Act 1999: VULNERABLE

Likelihood: MODERATE

Size: 25 – 40 mm

Habitat: Wallum swamps with acidic water (pH 3.5-6). Heathlands and sedgelands.

Breeding: Permanent or ephemeral, acidic, freshwater Wallum wetlands with emergent sedge, reeds or ferns.

Black-faced monarch (*Monarcha melanopsis*)

NC Act 1992: SPECIAL LEAST CONCERN

Likelihood: LOW

Size: 16 – 19 cm

Habitat: Rainforest, wet eucalypt woodland, coastal scrub and damp gullies.

Breeding: Deep, cup nest made from casuarina needles, bark, and roots, constructed in tree fork.

Koala (*Phascolarctos cinerus*)

NC Act 1992: ENDANGERED
EPBC Act 1999: ENDANGERED

Likelihood: LOW

Size: 60 – 85 cm

Habitat: Open and closed forest generally dominated by *Eucalyptus*, *Corymbia*, *Angophora* or *Lophostemon* trees, usually near a watercourse.

Breeding: Do not require specific location for breeding, but as they are solitary animals, they require large, connected habitat that overlaps other individuals home ranges, to encounter other sex for mating.

White-throated needletail (*Hirundapus caudacutus*)

NC Act 1992: VULNERABLE
EPBC Act 1999: VULNERABLE

Likelihood: LOW

Size: ~ 20 cm length, ~ 50 cm wingspan

Habitat: Almost exclusively aerial species, mainly occur above wooded areas, sometimes over beaches and around coastal cliffs.

Breeding: Does not breed in Australia.

Wood sandpiper (*Tringa glareola*)

NC Act 1992: SPECIAL LEAST CONCERN

Likelihood: LOW

Size: 19 – 23 cm length, ~ 56 cm wingspan

Habitat: Inland freshwater wetlands, with shallow water pools and emergent vegetation, surrounded by tall plants and woody debris.

Breeding: Does not breed in Australia.

Australia Wide Environmental Consultants
ABN 67 618 756 291

T: 0458 293 759
E:admin@awenv.com.au
33 Ballantyne Court, Glenview
Queensland 4553 Australia

SITE CONTEXT – SIGNIFICANT SPECIES

(PAGE 1 OF 1)

CLIENT:
Hall Contracting

CREATED BY: AC

APPROVED BY: YV

ISSUE	DESCRIPTION	DATE
REV.0	FOR USE	AUG 2022

4.2 Survey Results

This report covers two areas to be cleared, one at the Southern end of the site (~ 1.57 Ha) and one at the end of Buckley Road, to the Northeast (~ 0.94 Ha). The vegetation consists of small to medium tree regrowth with dense grassy groundcover (FIGURE 4). Tree species are predominantly Melaleuca, with some occasional Eucalyptus species present. Asparagus fern and billy goat weed species are present in more disturbed section of the site.

FIGURE 4 – SITE VEGETATION

Multiple habitat features were located within the clearing extents, including eight habitat trees (as defined by the Moreton Bay Regional Council; diameter at breast height (DBH) greater than 80cm), one hollow, woody debris, nine areas of thick groundcover and three sections with ground water present. Old possum and Koala scratch marks were present as well as macropod tracks. These features and signs are displayed in TABLE 4 and FIGURE 5.

TABLE 4 – HABITAT FEATURES & FAUNA SIGNS

#	Description	Location	
Fauna signs			
1	Stick nest 	-27.11965942	152.9996534
8	Tracks (macropod)	-27.12074315	152.9994661
9	Tracks 	-27.11940002	152.999957
15	Scratch marks	-27.12806702	152.9922621
19	Scratch marks	-27.12844849	152.9934545
25	Scratch marks 	-27.12850952	152.9946915
26	Tracks	-27.12849426	152.9947207
Habitat Features			
2	MBRC Habitat Tree	-27.11965942	152.9996534

#	Description	Location	
Fauna signs			
3	MBRC Habitat Tree 	-27.11952209	152.9995805
4	Dense vegetation	-27.11959839	152.9996828
5	MBRC Habitat Tree	-27.11967468	152.9997371
6	Aquatic habitat 	-27.1194458	152.9997366
7	MBRC Habitat Tree	-27.11949158	152.9995435
10	Dense vegetation 	-27.11940002	152.999957
11	MBRC Habitat Tree	-27.11941528	153.0003479

#	Description	Location	
Fauna signs			
12	MBRC Habitat Tree	-27.11935425	153.0002872
13	Dense vegetation 	-27.11935425	153.0002676
14	Dense vegetation	-27.11921692	153.0002826
16	MBRC Habitat Tree	-27.12806702	152.9922621
17	Dense vegetation	-27.12806702	152.9921927
18	Dense vegetation	-27.12849426	152.9931749
20	Dense vegetation	-27.12838745	152.9937788
21	Hollow 	-27.12838745	152.9938302
22	Woody debris	-27.12841489	152.9940105
23	Dense vegetation	-27.12840271	152.9941209
24	Dense vegetation	-27.12846375	152.9942835

#	Description	Location	
Fauna signs			
27	Aquatic habitat 	-27.12866211	152.9962371
28	Aquatic habitat	-27.12872314	152.9966295
29	MBRC Habitat Tree	-27.12872314	152.9967508

Opportunistic sightings were of least concern avian species. No threatened species were sighted during the survey (TABLE 5).

TABLE 5 – SIGHTED FAUNA BIODIVERSITY

Common name	Scientific name	Conservation Status
Avian species		
Australian magpie	*Gymnorhina tibicen*	Least Concern
Black kite	*Milvus migrans*	Least Concern
Eastern great egret	*Ardea alba modesta*	Least Concern
Magpie-lark	*Grallina cyanoleuca*	Least Concern
Pied butcherbird	*Cracticus nigrogularis*	Least Concern
Willie wagtail	*Rhipidura leucophrys*	Least Concern
Torresian crow	*Corvus orru*	Least Concern

FIGURE 5– HABITAT FEATURES & FAUNA RELOCATION

4.2.1 Fauna Capture & Relocation

Fourteen animals were successfully relocated, no injuries or fatalities occurred (TABLE 6).

TABLE 6- RELOCATED FAUNA

Date	Scientific name	Common name	Capture location		Release location		#	Released
								
19/09/2022	*Intellagama lesueurii*	eastern water dragon	-27.12844	152.99441	-27.12870	152.99634	1	Yes
								
25/05/2023	*Pogona barbata*	bearded dragon	-27.12825	1 52.99238	-27.12841	152.99259	1	Yes
						TOTAL	2	

4.3 Nest Box Management Measures

The aim of the nest boxes is to compensate for the loss of habitat features by the development of the site. The types of nest boxes to be installed will be influenced by the desktop research results within the Nest Box Management Plan, Fauna Pre-clearance Survey and fauna relocated during clearing works.

4.3.1 Development Conditions from Moreton Bay Regional Council

Development must not result in the net loss of fauna habitat. Where development results in the loss of a Habitat Tree (trees with a DBH greater than 800mm), development must provide replacement fauna nesting boxes at the following rate:

- One nest box for every hollow removed, with a minimum of three nest boxes for each habitat tree removed; or
- Where hollows have not yet formed, three nest boxes for every habitat tree removed.

Any hollows observed in cleared vegetation must be salvaged and installed as nest boxes in trees within the property or other location agreed with Council.

4.3.2 Nest Box Calculation

In line with the development conditions outlined in the above section, the following calculations were made for the amount of nest boxes required at this site.

This site contains 8 trees with DBH greater than 800 mm and 1 trunk hollow. All habitat features are proposed to be removed, therefor 25 nest boxes are recommended for this site (TABLE 6).

TABLE 6 – NEST BOX CALCULATIONS

	HOLLOWS	HABITAT TREES
Number	1	8
Calculations		8 X 3 = 24
No. of nest box required	1	24
Total		**25**

Where possible habitat features can be retained and placed in retained vegetation in place of a nest box. The amount of nest boxes to be used is subject to change according to clearing works and post-clearance survey.

5 CONCLUSION

Australia Wide Environmental Consultants (AWEC) were commissioned by Hall Contracting to manage fauna during clearing works for the continued development of North Harbour, along Buckley Road, Burpengary East, Queensland.

A suitably qualified and licenced FSC was on site for the duration of clearing works to ensure all fauna management measure were adhered to.

No active nests or breeding sites were encountered on site during clearing works.

Two animals were successfully relocated during clearing works, no injuries or fatalities of occurred.

AWEC can confirm the site clearing works were conducted in a manner that complied with the statutory requirements and guidelines in relation to flora and fauna management, including aquatic animals.

6 REFERENCES

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156-HC2208-D

FAUNA POST-CLEARANCE REPORT

NORTH HARBOUR
93 BUCKLEY ROAD
BURPENGARY EAST, QUEENSLAND

Prepared for client:
HALL CONTRACTING

Date:
28th September 2022

AWEC
ENVIRONMENTAL
CONSULTANTS

Document Prepared by:

Australia Wide Environmental Consultants
ABN 67 618 756 291
33 Ballantyne Court
Glenview
Queensland 4553 Australia
T: 0458 293 759
E: admin@awenv.com.au

Revision History

Rev. #	Issue Date	Revision Details	Prepared By	Reviewed By	Approved By
0	November 2022	For Use	Alina Cherkasskaia	Yolande Venter	Yolande Venter
1					
2					

Document Approval

Approved:	Name:	Signature:	Date:
Company Director	Yolande Venter		NOV 2022

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 INTRODUCTION

1.1 Background

Australia Wide Environmental Consultants (AWEC) were commissioned by Hall Contracting to manage fauna during clearing works for the continued development of North Harbour, along Buckley Road, Burpengary East, Queensland.

The entire project is approximately 122 Ha, with multiple stages of residential subdivision (FIGURE 1). Most of the project site has already been cleared and developed, this report includes two areas of remaining vegetation: a narrow strip along the Southern edge and a patch at the end of Buckley Rd, in the Northeast of the development (FIGURE 2).

1.2 Ecologist and Qualifications

The AWEC nominated Ecologist is Yolande Venter who is a degree qualified ecologist/environmental coordinator with over 15 years of field experience within the ecology and environmental sectors.

1.3 Scope

A. See TABLE 1 for a non-exhaustive list of the statutory requirements and guidelines this project adheres to.

B. A desktop review of the site's potential ecological value and any planning constraints.

C. A site inspection which included ground truthing the desktop review findings and a fauna survey.

D. Management measures to control the risk to native fauna during these works.

FIGURE 1– DEVELOPMENT LAYOUT

2 STATUTORY REQUIREMENTS AND GUIDELINES

See TABLE 1 below for the relevant statutory requirements and guidelines.

TABLE 1– STATUTORY REQUIREMENTS AND GUIDELINES

Legislation	Purpose of Legislation	Impact on Project personnel
Environmental Protection Regulation 2019	Gives legislative support to various national guidelines, plans and Australian Standards. This regulation also outlines requirements for the management of fauna and flora.	To abide by the regulations within the DES.
Environmental Protection and Biodiversity Conservation Act 1999	The EPBC Act 1999 focuses Australian Government interests on the protection of matters of national environmental significance, with the states and territories having responsibility for matters of state and local significance.	To comply with the relevant sections of the Act that relate to matters of national significance which are present in the vicinity of the project works.
Nature Conservation and Other Legislation Amendment Act 2016	The Act provides for the legislative protection of Queensland's threatended biota. It is aligned with the IUCN redlist which categorises biota into their current status in the wild.	To comply with the relevant sections of the Act and regulations and the Environmental Authority administered by the DES.
Nature Conservation (Wildlife) Regulation 2006	This Regulation lists the plants and animals considered presumed extinct, endangered, vulnerable, rare, common, international, and prohibited. It discusses their significance and states the declared management intent and the principles to be observed in any taking and use for each group.	List those animals that may be potentially found on sites being developed as part of the project and limitations for management.
Nature Conservation (Wildlife Management) Regulation 2006	This Regulation provides for the management of wildlife (including taking, keeping and using wildlife including protected plants).	Provides guidance for the management of wildlife on site, particularly in relation to the interference with native wildlife during the clearing process.
Nature Conservation and Other Legislation (Koala Protection) Amendment Regulation 2020	Guideline for identifying and managing Koala habitat	Provides guidance on where Koala spotter/ Endorsed FSC are legally required and how they are to manage Koala habitat.

Legislation	Purpose of Legislation	Impact on Project personnel
Animal Care and Protection Act 2001	Animal Welfare	Outlines that animal ethics approval is needed for research, survey and/or monitoring involving vertebrates, where activities such as trapping, census leading to disturbance of animals (such as spotlighting or call play-back), abnormal interruption of behaviour or marking/tagging are involved.
Australian code for the care and use of animals for scientific purposes 8th edition (2013)	Ethical framwork for animals used for scientific purposes	Governing principles set out in the Code provide guidance for investigators, teachers, institiutions, animal ethics committees and all the people involved in the care and use of animals for scientific purposes.
Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (2018)	Guidelines for Fauna Surveys	Detailed guidelines on designing a survey, the different survey methadologies and the ethical considerations that need to be made for each methadology.
Queensland Hygiene protocol for handling amphibians	Protocol for handling amphibian species	Outlines how to handle and manage amphibian species to prevent the spread of diseases among specimens and colonies.
Code of Practice- Care and rehabilitation of orphaned, sick or injured protected animals by wildlife carers(2013)	Provides guidelines on the rehabilitation and care of wildlife	Detailed guidelines, in regards to hygiene, housing, capture and release, euthanasia and relevant legistation
Seqwater- Guideline- Fish Stranding and Salvage	The purpose of this guidance document is to ensure native fish recovery operations are conducted in a timely and safe manner to minimise or eliminate loss of fish from stranding.	Guideline on managing aquatic fauna during dewatering works.

Legislation	Purpose of Legislation	Impact on Project personnel
Fisheries Act 1994	The main purpose of the *Fisheries Act 1994* is to provide for the use, conservation and enhancement of the community's fisheries resources and fish habitats in a way that seeks to apply the principles of ecologically sustainable development.	Outlines fish habitats and fish movement and migration (regulation of waterway barriers). Guidelines on commercial, recreational and indigenous fishing.
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.	Under the *Biosecurity Act 2014*, pest species must not be kept, fed, given away, sold, or released into the environment without a permit. Under the *Biosecurity Act 2014*, everyone has a general biosecurity obligation (GBO) to take reasonable and practical steps to minimise the risks associated with restricted plants and animals.
DAF Guidelines for Fish Salvage, 2018	Purpose of these guidelines is to minimise the risk to aquatic fauna during dewatering works.	These guidelines provide detailed instructions for dewatering waterbodies and slavaging aquatic fauna.

Australia Wide Environmental Consultants (AWEC) holds a current DES rehabilitation permit (Permit #WA0027769), with an extended authority issued by the Department of Environment and Science specifying that the holder may take, keep, or use an animal whose habitat is about to be destroyed by human activity.

3 METHODOLOGY

3.1 Desktop Review

Prior to commencing the survey, all previous surveys and management plans related to the site were reviewed, as well as extensive desktop research of the intended site.

The results of the desktop review allowed the survey to be designed to target the significant species most likely to be encountered within the proposed survey location. Benefits of the desktop review prior to commencing the survey included: Increased knowledge of the site by understanding;

- The overall habitat value,
- Range of habitat features,
- Floral structural complexity,
- Available water and food sources.

3.1.1 Regulated Vegetation Management

Land clearing in Queensland is regulated under the *Land Act 1994* and the vegetation management framework. To ensure this site will not have detrimental environmental impacts to the local biodiversity appropriate vegetation mapping was viewed on Queensland Globe. The vegetation management regional ecosystem layer was used to establish the Regional Ecosystems (REs) on site.

3.1.2 Koala Habitat Planning and Management

Nature Conservation and Other Legislation (Koala Protection) Amendment Regulation 2020 is an overarching state planning instrument that regulates new development at the development assessment stage. The new Koala planning framework is based upon scientifically based, consistent Koala habitat mapping. The framework applies consistently across SEQ and establishes where clearing may be prohibited, where it is assessable by the State, where Koala conservation outcomes will be considered by local governments and what exemptions may apply.

The Koala Plan layer was viewed on Queensland globe to establish koala habitat areas.

3.1.3 Significant Fauna Species List

A species list was collated by a suitably qualified ecologist, sourced from the Queensland Government WildNet Database (2021). This established the significant species with confirmed sighting records since 1980, within a 2 km radius of the central coordinates of the site.

3.2 Survey Planning

The survey methodology considered the following aspects:

- Size of the survey site
- Timeframes
- Access
- Workplace Health & Safety
- EVNT Native species confirmed- terrestrial/ arboreal
- Feral species
- Complexity of potential breeding places
- Marking of potential habitat features.

The methodology used for this survey was the active diurnal search methodology incorporating a meandered pattern. This method was suitable for the large survey area with complex habitat and time constraints.

The main objective of this survey was to locate any active or potential native fauna breeding places and high value habitat features.

The extent was surveyed by a suitably qualified person.

The number of meanders completed depended on the vegetation community and the number of habitat features present within the site. During the survey, photographs of unidentified scat, tracks and signs were taken, researched, peer reviewed, and identified using the appropriate reference materials.

3.3 Pre-Clearance Survey

Site was surveyed by a suitably qualified ecologist on 16th August 2022 which included ground-truthing via meandering transects.

The purpose of the survey is to record the sites overall habitat value, significant habitat features, vegetation connectivity within the site and surrounding lots, fauna signs and opportunistic fauna sightings and the site's suitability for the significant species likely to occur in the area.

A thorough aural/visual fauna survey was conducted including a systematic traverse throughout the site searching for fauna individuals and habitat features.

The following habitat features are considered significant and were recorded if observed:

- Tree hollows (branch and crown)
- Native wildlife nests (stick nests)
- Burrows (feeding burrows)
- Fallen/felled timber
- Thick groundcover
- Fissured bark
- Rocky outcrops

- Aquatic habitat
- And flora species considered Koala habitat trees under the *Nature Conservation and Other Legislation (Koala Protection) Amendment Regulation 2020*.

3.4 Fauna Survey Methods

The methods presented below were as part of the fauna field survey:

3.4.1 Animal Signs

Some native wildlife leave scat, tracks and scratches that can be identified and are described by Barbara Triggs (2004). These indicators should be used to provide evidence for identification without an actual physical sighting.

3.4.2 Diurnal Avian Survey

This non-intrusive active area search provides a census of the avian biodiversity and abundance within the survey site. This survey technique requires a skilled observer with relevant experience in local bird species and bird calls. Site transects are traversed slowly shortly after dawn when birds are most active. Avoid disturbing nesting birds during the survey.

3.4.3 Koala Survey

The Spot Assessment Technique was undertaken, as recommended in the EPBC Act 1999 Referral Guidelines for the Endangered Koala (DoE 2013). This technique involved faecal pellet searches of a 100 cm radius around selected trees at each Spot Assessment Technique site. The method applied was varied from that described in Phillips and Callaghan (2011), by randomly selecting the centre tree (from a randomly generated location) and searching under both potential food and shelter trees (i.e., not limited to trees of the *Eucalyptus*, *Corymbia*, *Angophora* or *Lophostemon* genera), based on evidence presented in Woosnam-Merchez *et al.* (2012).

Note: During the fauna pre-clearance survey smooth bark trees were examined for scratch marks, in the event Koala scratch marks were evident this assessment technique was conducted and data logged.

3.5 Emergency Procedures

During the trapping and construction phases it is likely that injured or sick wildlife will be encountered onsite. Local carers and veterinarians contact details should be always available. Moreover, all staff conducting trapping should be trained in the emergency first aid of native wildlife and carry the required first aid equipment to stabilise native fauna for transport and correct transportation cages. All sick and orphaned wildlife will be taken to the Australia Zoo Wildlife Hospital, 1638 Steve Irwin Way, Beerwah, (07) 5436 2097 or RSPCA Wildlife Hospital, 139 Wacol Station Road, Wacol, (07) 3426 9999.

4 RESULTS

4.1 Desktop Review

4.1.1 Regulated Vegetation Management

Vegetation within the clearing footprint is predominantly non-remnant, with a small section of high value regrowth mapped along the Southern edges of the Southern area. These are RE 12.5.3 (Endangered and suitable Koala habitat) and RE 12.3.5 (Least Concern). (FIGURE2 and TABLE 2). No RE's are mapped within the Northern clearing extent.

TABLE 2 – REGIONAL ECOSYSTEMS

RE	VM Act Status	Short Description
12.5.3	Endangered	*Eucalyptus racemosa subsp. racemosa* woodland with *Corymbia intermedia, E. siderophloia +/- E. tindaliae, E. resinifera, E. pilularis, E. microcorys, Angophora leiocarpa. Melaleuca quinquenervia* is often a prominent feature of lower slopes. Minor patches (<1ha) dominated by *Corymbia citriodora subsp. variegata* sometimes occur. Occurs on complex of remnant Tertiary surfaces +/- Cainozoic and Mesozoic sediments. Potential habitat for NCA listed species: *Allocasuarina emuina, Eucalyptus curtisii, Leptospermum oreophilum*. This ecosystem is known to provide suitable habitat for Koala's.
12.3.5	Least Concern	*Melaleuca quinquenervia* open forest on coastal alluvium. Habitat for threatened flora species including *Phaius australis* and *P. bernaysii*. Habitat for threatened fauna including the wallum froglet (*Crinia tinnula)*. This ecosystem is known to provide suitable habitat for Koala's.

4.1.2 Koala Habitat Planning and Management

The area mapped as RE 12.5.3 is also mapped as Core Koala Habitat (FIGURE 4).

FIGURE 2- SITE CONTEXT

4.1.1 Significant Species

This database provided a list of fauna species previously recorded in the area, of which included 2 Vulnerable, 2 Special Least Concern and 1 Endangered species.

The assessment of the likelihood of each species' occurrence on site was determined from the desktop assessment and field surveys. The assessment of the likelihood of each species' occurrence on site was determined from the desktop assessment and field surveys and classified as 'low', 'moderate' and 'high'.

There is aquatic habitat on site which would be appropriate for the wallum sedgefrog, therefore there is a moderate chance for encountering this species and particular attention should be paid for this species. The remaining significant species are unlikely to be encountered but caution should still be taken.

PRE-CLEARANCE REPORT
North Harbour, 293 Buckley Road, Burpengary East, Queensland

Field Guide for Significant Species likely to be encountered on site

These animals were returned in a WildNet search for a 2 km radius of the site.

TABLE 3 - SIGNIFICANT SPECIES

Wallum sedgefrog (*Litoria olongburensis*)

Handle with care if relocating, following Amphibian Handling Protocol

NC Act 1992: VULNERABLE
EPBC Act 1999: VULNERABLE

Likelihood: MODERATE

Size: 25 – 40 mm

Habitat: Wallum swamps with acidic water (pH 3.5-6). Heathlands and sedgelands.

Breeding: Permanent or ephemeral, acidic, freshwater Wallum wetlands with emergent sedge, reeds or ferns.

Black-faced monarch (*Monarcha melanopsis*)

NC Act 1992: SPECIAL LEAST CONCERN

Likelihood: LOW

Size: 16 – 19 cm

Habitat: Rainforest, wet eucalypt woodland, coastal scrub and damp gullies.

Breeding: Deep, cup nest made from casuarina needles, bark, and roots, constructed in tree fork.

Koala (*Phascolarctos cinerus*)

NC Act 1992: ENDANGERED
EPBC Act 1999: ENDANGERED

Likelihood: LOW

Size: 60 – 85 cm

Habitat: Open and closed forest generally dominated by *Eucalyptus*, *Corymbia*, *Angophora* or *Lophostemon* trees, usually near a watercourse.

Breeding: Do not require specific location for breeding, but as they are solitary animals, they require large, connected habitat that overlaps other individuals home ranges, to encounter other sex for mating.

White-throated needletail (*Hirundapus caudacutus*)

NC Act 1992: VULNERABLE
EPBC Act 1999: VULNERABLE

Likelihood: LOW

Size: ~ 20 cm length, ~ 50 cm wingspan

Habitat: Almost exclusively aerial species, mainly occur above wooded areas, sometimes over beaches and around coastal cliffs.

Breeding: Does not breed in Australia.

Wood sandpiper (*Tringa glareola*)

NC Act 1992: SPECIAL LEAST CONCERN

Likelihood: LOW

Size: 19 – 23 cm length, ~ 56 cm wingspan

Habitat: Inland freshwater wetlands, with shallow water pools and emergent vegetation, surrounded by tall plants and woody debris.

Breeding: Does not breed in Australia.

Australia Wide Environmental Consultants
ABN 67 618 756 291

T: 0458 293 759
E:admin@awenv.com.au
33 Ballantyne Court, Glenview
Queensland 4553 Australia

SITE CONTEXT – SIGNIFICANT SPECIES

(PAGE 1 OF 1)

CLIENT:
Hall Contracting

CREATED BY: AC

APPROVED BY: YV

ISSUE	DESCRIPTION	DATE
REV.0	FOR USE	AUG 2022

4.2 Survey Results

Area to be cleared is approx. 15m wide strip at the northern end of Buckley Rd. Vegetation is dense woodland scrub with semi tropical speices as well as various Gums. Speices include Camphor Laurel, Melaleuca, Scribbly Gum, Casurina, Ferns. Ground covers is dense leaf litter and knee-high grass.

FIGURE 3 – SITE VEGETATION

TABLE 4 – HABITAT FEATURES & FAUNA SIGNS

#	Description	Location	
Fauna signs			
1	Aquatic habitat 	-27.1215087	153.0009847

Opportunistic sightings were of least concern avian species. No threatened species were sighted during the survey (TABLE 5).

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Magpie-lark	*Grallina cyanoleuca*	Least Concern
Pied butcherbird	*Cracticus nigrogularis*	Least Concern
Willie wagtail	*Rhipidura leucophrys*	Least Concern
Torresian crow	*Corvus orru*	Least Concern
noisy miner	*Manorina melanocephala*	Least Concern
rainbow lorikeet	*Trichoglossus moluccanus*	Least Concern
variegated fairy-wren	*Malurus lamberti*	Least Concern
welcome swallow	*Hirundo neoxena*	Least Concern
tawny grassbird	*Megalurus timoriensis*	Least Concern

FIGURE 4– HABITAT FEATURES & FAUNA RELOCATION

4.2.1 Fauna Capture & Relocation

Fourteen animals were successfully relocated, no injuries or fatalities occurred (TABLE 6).

TABLE 6– RELOCATED FAUNA

Date	Scientific name	Common name	Capture location		Release location		#	Released
28/09/2022	*Grallina cyanoleuca*	magpie-lark	-27.12208	153.00189	-27.12178	153.00274	1	Yes

28/09/2022	*Morelia spilota*	Carpet python	-27.12178	153.00129	-27.12336	153.00104	1	Yes
						TOTAL	2	

5 CONCLUSION

Australia Wide Environmental Consultants (AWEC) were commissioned by Hall Contracting to manage fauna during clearing works for the continued development of North Harbour, along Buckley Road, Burpengary East, Queensland.

A suitably qualified and licenced FSC was on site for the duration of clearing works to ensure all fauna management measure were adhered to.

One Least Concern reptile was successfully relocated during clearing works, no injuries or fatalities of occurred. One Active breeding site was relocated, an active Magpie Lark nest was relocated into adjacent vegetation. Parent followed the nest to the new location, nest was monitored and parent sat back down on the eggs.

AWEC can confirm the site clearing works were conducted in a manner that complied with the statutory requirements and guidelines in relation to flora and fauna management, including aquatic animals.

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