Thrumster Wastewater Scheme

Response to Submissions

Port Macquarie-Hastings Council

9 April 2025

→ The Power of Commitment

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Executive summary

Introduction

Port Macquarie-Hastings Council (Council) is proposing to develop the Thrumster Wastewater Scheme which includes a new wastewater treatment plant (WWTP), associated pipelines and infrastructure to service Thrumster, Sancrox, Fernbank Creek and catchment diversions from the Port Macquarie Wastewater Scheme (the project). The project is located on the Mid North Coast of NSW and is required to service key areas for future growth in the region.

The project has been declared as State Significant Infrastructure (SSI) and is a priority project for Council to ensure communities have access to necessary resources in a safe and reliable manner. The project is seeking the Minister's approval to construct and operate the wastewater scheme.

This Response to Submissions (RTS) report provides a summary of the submissions received during the exhibition of the environmental impact statement (EIS) and responses to the issues raised in those submissions to allow for a determination of the project by the NSW Minister for Planning and Public Spaces.

This report is subject to, and must be read in conjunction with, the limitations set out in Section 1.4 and the assumptions and qualifications contained throughout this report.

Public exhibition and submissions

An EIS was prepared for the project and was placed on public exhibition between 6 August 2024 and 2 September 2024. The Department of Planning, Housing and Infrastructure (DPHI) received a total of 28 submissions during the exhibition of the EIS and a further three submissions after resulting in 31 submissions. Table E.1 groups the submissions received by submitter and whether they are in support, for comment, or objection.

Table E.1 Summary of submissions received

Source	Support	Comment	Objection	Total
Government agencies	1	14		15
Community and individuals	9	2	5	16
Total	**10**	**16**	**5**	**31**

Project amendments

Amendments to the project footprint have been identified due to the development of the detailed design and consultation with agencies throughout the environmental assessment process. These include a reduced laydown area adjacent to the proposed WWTP to minimise impacts to biodiversity and minor amendments to the pipeline network.

These changes will be addressed and described in further detail as part of the Thrumster – Amendment Report, to be issued to the DPHI separately.

Stakeholder engagement

Additional consultation undertaken following the exhibition of the EIS included community pop-up sessions arranged by Council, and publishing information throughout news sources (online). Following this consultation, further clarification has been requested from local residences regarding potential odour impacts.

Port Macquarie-Hastings Councill will continue to consult with the community during construction and operation of the project.

Conclusion

The project has been designed and assessed with regard to the matters for consideration under the EP&A Act and is consistent with the principles of ecologically sustainable development.

The project comprises the construction and operation of a new WWTP and associated pipelines and infrastructure within the Port Macquarie-Hastings LGA and is required to respond to the future population growth expected in the LGA.

With the implementation of the proposed management and mitigation measures outlined in Appendix B and in Appendix D of the EIS, the beneficial effects of the project are considered to significantly outweigh any potential negative impacts.

This report is subject to, and must be read in conjunction with, the limitations set out in Section 1.4 and the assumptions and qualifications contained throughout the Report.

Terms and abbreviations

Abbreviations	Definition
ACHA	Aboriginal Cultural Heritage Assessment
ACHMP	Aboriginal Cultural Heritage Management Plan
AHIMS	Aboriginal Heritage Information Management System
AS	Australian Standard
BAM	Biodiversity Assessment Method
BDAR	Biodiversity Development Assessment Report
Council	Port Macquarie-Hastings Council
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPE	Department of Planning and Environment
DPHI	Department of Planning, Housing and Infrastructure
DPI	NSW Department of Primary Industries
DPIE	NSW Department of Planning Industry and Environment
EIS	Environmental Impact Statement
EPA	NSW Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPL	Environment Protection Licence
HDD	Horizontal Directional Drilling
Heritage Act	*Heritage Act 1977* (NSW)
IAP2	International Association of Public Participation
IPCC	Intergovernmental Panel on Climate Change
JSA	Job Safety Analysis
LGA	Local Government Area
LUCRA	Land use conflict risk assessment
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
PAD	Potential archaeological deposits
PCT	Plant community type
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
RAPs	Registered Aboriginal Parties
RFS	Rural Fire Service
Roads Act	*Roads Act 1993* (NSW)
SSI	State Significant Infrastructure
TfNSW	Transport for NSW
WM Act	*Water Management Act 2000* (NSW)
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant
WWS	Wastewater Scheme

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1. Introduction

1.1 Background

The Thrumster Wastewater Treatment Scheme involves the development of a new Wastewater Treatment Plant (WWTP) located in Thrumster with associated pipelines and infrastructure in the Port Macquarie region on the NSW Mid North Coast.

The primary objective for the project is to support recent urban growth in the outer suburbs of Port Macquarie. The new wastewater scheme will reduce demand on the existing Port Macquarie WWTP and improve the resilience, redundancy and ongoing capacity of Council's infrastructure services, and facilitate planned future growth in the Thrumster, Sancrox and Fernbank Creek development areas.

The project would include:

– New WWTP, including a recycled water plant within Lot 14, DP 1139180 on 433 Fernbank Creek Road, Fernbank Creek.
– Return treated effluent pipeline to Kooloonbung Creek.
– New access road to the WWTP and a supplementary flood-proof, all-weather access road.
– New sewage pumping stations, sewer rising mains, sewer gravity mains, recycled water mains and potable water connection.
– Upgrade works at identified existing sewer pump stations (SPSs) to reduce the current load on the existing system.
– Improvements to optic fibre and electricity supply.

The WWTP would be constructed on Council owned land on the floodplain adjacent to Partridge Creek, about six kilometres west of the Port Macquarie Central Business District. The treatment plant will be constructed on a raised earthen pad formed with imported fill to meet Council's flood protection requirements. A 20 metre Asset Protection Zone (APZ) has been applied to the current design and would be fully incorporated within the proposed cleared, filled and built area.

The project also includes sewerage infrastructure including sewer rising mains and recycled water mains, pump stations, an access road, an effluent pond, storage areas, works compounds, and administration buildings. Key strategies to avoid, minimise or offset the impacts of the project have been considered through the design of the project. Pipelines routes have been designed to follow existing easements and cleared land, where practical, to avoid areas of high ecological value and potential sensitivity of native vegetation/communities in the locality. Consultation with affected property owners, stakeholders and the local community will continue throughout the project assessment, design and construction phases to minimise impacts where possible.

1.2 Project objectives

The key objectives of the project are:

– To construct and commission the Thrumster Wastewater Scheme upgrade by 2028 to address the existing capacity constraints and operational risk faced by Council.
– To provide treatment capacity to allow for future growth and reduce the load on the current Port Macquarie WWTP to minimise loss of sewerage network containment, environmental contamination, and allow important preventative maintenance to occur.
– To promote Council as a regional leader through the project delivery and improve the standard of community and environmental outcomes in areas including:
    - Network odour and loss of containment events in the sewerage network impacting the community.
    - Energy efficiency and power usage associated with sewer collection, transfer and treatment.
    - Providing high quality recycled water for third pipe scheme including potential future industrial users.

- Enable Council to implement biosolids resource recovery processes and manage biosolids stabilisation as part of Council's broader centralised organics recycling strategy.

– To provide a reliable and resilient sewerage scheme.

1.3 Purpose and structure of this report

This Response to Submissions (RTS) report has been prepared by GHD Pty Ltd (GHD) on behalf of Port Macquarie-Hastings Council (Council) to support the application for Infrastructure Approval for the project. This report is supported by information prepared by subconsultants to GHD and Council. The purpose of this document is to respond to submissions received for the project, as well as clarify the extent of potential impacts related to the project.

During exhibition of the EIS, the Department of Planning, Housing and Infrastructure (DPHI) received 28 submissions, comprised of 13 public submissions, and 15 letters of agency advice. Three (3) additional public submissions were received after the exhibition period had closed (bringing the total to 31) and are included in this report. DPHI has provided copies of these submissions to Port Macquarie-Hastings Council. In accordance with section 5.17(6) of the *Environmental Planning and Assessment Act 1979* (EP&A Act), the Secretary requires the proponent to provide responses to the issues raised in the submissions.

This report has been prepared in accordance with the DPHI guideline *'State significant infrastructure guidelines – preparing a submissions report'* (DPHI, 2024). The report is structured as follows:

– Chapter 1 introduction and background.

– Chapter 2 analysis of submissions.

– Chapter 3 summarises actions taken since exhibition, including any project changes, community and stakeholder engagement, and further assessment.

– Chapter 4 provides a response to submissions.

– Chapter 5 provides an updated project description.

– Appendix A includes a register of all submissions received.

– Appendix B provides a list of management measures updated in response to issues raised in the submissions.

– Appendix C supporting information, including any detailed engagement or technical reports.

1.4 Scope and limitations

This report has been prepared by GHD Pty Ltd for Port Macquarie-Hastings Council and may only be used and relied on by Port Macquarie-Hastings Council for the purpose agreed between GHD and Port Macquarie-Hastings Council as set out in Section 1.3 of this report.

GHD Pty Ltd otherwise disclaims responsibility to any person other than Port Macquarie-Hastings Council arising in connection with this report. GHD Pty Ltd also excludes implied warranties and conditions, to the extent legally permissible.

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

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

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

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

2. Analysis of submissions

2.1 Overview

DPHI received a total of 31 submissions during the exhibition of the EIS. Table 2.1 groups the submissions received by submitter and whether they are in support, for comment or objection.

Table 2.1 Summary of submissions received

Source	Support	Comment	Objection	Total
Government agencies	1	14		15
Community and individuals	9	2	5	16
Total				**31**

The designation of submissions as being in support, comment or objection shown in Table 2.1 is based on the designation made by DPHI on the Major Projects Website.

2.2 Submitters

The submissions received consist of:

– **Government agencies:**
  - DPHI.
  - New South Wales Rural Fire Service (NSW RFS).
  - NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) Biodiversity Conservation and Science Group (BCS) and National Parks and Wildlife (NPWS) joint response.
  - Fire and Rescue NSW (FRNSW).
  - New South Wales State Emergency Service (NSW SES).
  - Department of Planning, Housing and Infrastructure (DPHI) – Crown Lands.
  - Civil Aviation Safety Authority (CASA).
  - NSW DCCEEW - Heritage NSW.
  - NSW DCCEEW - Heritage Council of NSW.
  - DPHI – NSW Resources.
  - Transport for NSW (TfNSW).
  - North Coast Health District – North Coast Population and Public Health Directorate.
  - Department of Primary Industries and Regional Development (DPIRD) – Agriculture.
  - DPIRD – Fisheries.
  - EPA.
– **Submissions from community members and individual residents:**
  - Sixteen (16) submissions.

2.3 Categorisation of issues

In accordance with the guideline *State significant infrastructure guidelines – preparing a submissions report* (DPIE, 2022), GHD has grouped issues raised in submissions into one of five broad categories:

– Project (e.g., the site/corridor, the physical layout and design, uses and activities, timing).
– Procedural matters (e.g., level or quality of engagement, compliance with the Secretary's Environmental Assessment Requirements (SEARs), identification of relevant statutory requirements).
– Economic, environmental and social impacts of the project (e.g., amenity, air, biodiversity, heritage).

– Justification and evaluation of the project (e.g., consistency of project with Government plans, policies or guidelines, support for the project).
– Issues that are beyond the scope of the project (e.g., broader policy issues) or not relevant to the project.

Table 2.2 sets out the subcategories of issues raised by the submissions received and to which of DPHI's five broad categories they relate, except for issues which are beyond the scope of the project. The number of submissions in this table adds up to a greater amount that the total number of submissions as multiple issue sub categories may be identified within one submission.

Table 2.2 Issues sub-categories

Primary Category	Issue Sub-category	No. of Submissions
Project	Design	2
	Construction method	1
	Cumulative impact assessment	1
	Design – APZ and Australian Standard	1
Procedural matters	Level or quality of engagement	5
	Fire Safety Study	1
	Scheduled development works and Environmental Protection License	1
Economic environmental social impacts	Biodiversity and biosecurity	4
	Aquatic ecology (oyster aquaculture)	2
	Water quality, hydrology and flooding	9
	Noise and vibration	3
	Land Use impacts and compensation, NPWS	9
	Public Health and Safety	3
	Social Impact Assessment and safety	5
	Ecologically Sustainable Development	1
	Soils and Contamination	1
	Traffic and Transport – congestion, road safety and speed limits	4
	Air Quality, odour and microorganisms	6
	Waste	1
	Services	1
	Heritage	1
	Wildlife Hazard Management Plan	1
	Exploration License	1
Justification and evaluation of the project	Support for project	9
	Port Macquarie Airport rezoning	1
	Bio certification	1

Appendix A provides a register of the submissions received and where in this report each submission has been addressed.

2.4 Summary of issues raised

A total of 40 issues were raised in the 31 submissions received. Issues were raised both in support and objection to the project.

2.4.1 Location of submitters

Submissions received have been categorised based on the location of the submitter. Location categories used were:

– Local (within 5 km of the project) – 16 community members (individual submissions).
– Regional (between 5 – 100 km project) – none.
– Broader (further than 100 km from the project) – 15 State agency submissions.

3. Actions taken since EIS exhibition

3.1 Project overview

The proposed WWTP is situated within Lot 14, DP1339180 on 433 Fernbank Rd, about 6 kilometres west of Port Macquarie Central Business District (CBD). The project generally includes the following:

– New WWTP, including a recycled water plant within Lot 14, DP 1139180 on 433 Fernbank Creek Road, about six kilometres west of Port Macquarie CBD.
– Return treated effluent pipeline to Kooloonbung Creek.
– Main access road to the WWTP and a flood-proof, all-weather access road.
– New sewer pump stations, sewer rising mains, recycled water mains and a potable water connection.
– Upgrade works at identified existing sewer pump stations (SPSs) to reduce the current load on the existing system.
– Improvements to site access, optic fibre connection and electricity supply.

It is anticipated that construction of the project would commence in 2025, subject to the required planning and regulatory approvals and is anticipated to take 2-3 years to complete.

Site compounds would be established within close proximity to the WWTP and at key locations along the pipeline routes. Each site compound has been chosen as they are cleared of native vegetation, outside of natural drainage lines and do not contain known Aboriginal heritage.

The Thrumster WWTP would service the areas of Sancrox, Thrumster, Fernbank Creek and catchment diversions from the Port Macquarie Wastewater Scheme. The project seeks approval for a WWTP to provide an initial treatment capacity for 40,000 equivalent population (EP) with design flow of 9.2 mega litres per day (ML/day), with design to be expandable to 80,000EP if required in the future.

The WWTP treatment process includes a continuous bioreactor with submerged membrane separation. The membrane bioreactor (MBR) is an advanced wastewater treatment technology capable of mechanical and biological nutrients reduction. The WWTP is equipped with UV and chlorine disinfection systems to provide multiple barriers against pathogens for the non-potable recycled water with recycled water design capacity of 4.7 ML/day included in the project.

It should be noted that the air quality and odour assessments were modelled under scenarios with and without an odour control unit (OCU). An OCU will be included in the final design which will provide additional mitigation of odour emissions if deemed required based upon ongoing monitoring of the performance of the WWTP.

The 40,000 EP capacity is anticipated to be reached by around 2039 or later based upon residential and non-residential growth within the Thrumster, Sancrox and Fernbank Creek development areas. The WWTP has been designed to be expandable in the future to an ultimate capacity of 80,000 EP, with a design flow of 18.4ML/day. The WWTP design considers the space requirements for future upgrade, including the duplication of bioreactor and membrane systems. Consideration for a future upgrade has also been given as part of the hydraulic design, site layout and process sizing of some treatment units that would be difficult to upgrade at a later date, such as the civil structures for the inlet works screening and grit removal facilities.

The project remains substantially the same as that proposed in the initial Thrumster WWS EIS subject to the amendments described in the subsequent sections.

3.2 Changes to the project

3.2.1 Preferred project

Amendments to the project footprint have been identified due to the development of the detailed design and ongoing consultation with agencies throughout the environmental assessment process. The proposed changes include a reduced laydown area adjacent to the proposed WWTP to minimise impacts to biodiversity and minor amendments throughout the pipeline network. These changes to the project footprint are shown in Figure 3.1 and outlined in Table 3.1.

These changes have been proposed:

– In response to agency submissions.
– To avoid the existing stewardship site.
– Following liaison with local businesses.
– Coordination with new developments.
– Development of detailed design and greater understanding of existing services.

These changes will be addressed and described in further detail as part of the Thrumster – Amendment Report, to be issued to the DPHI separately.

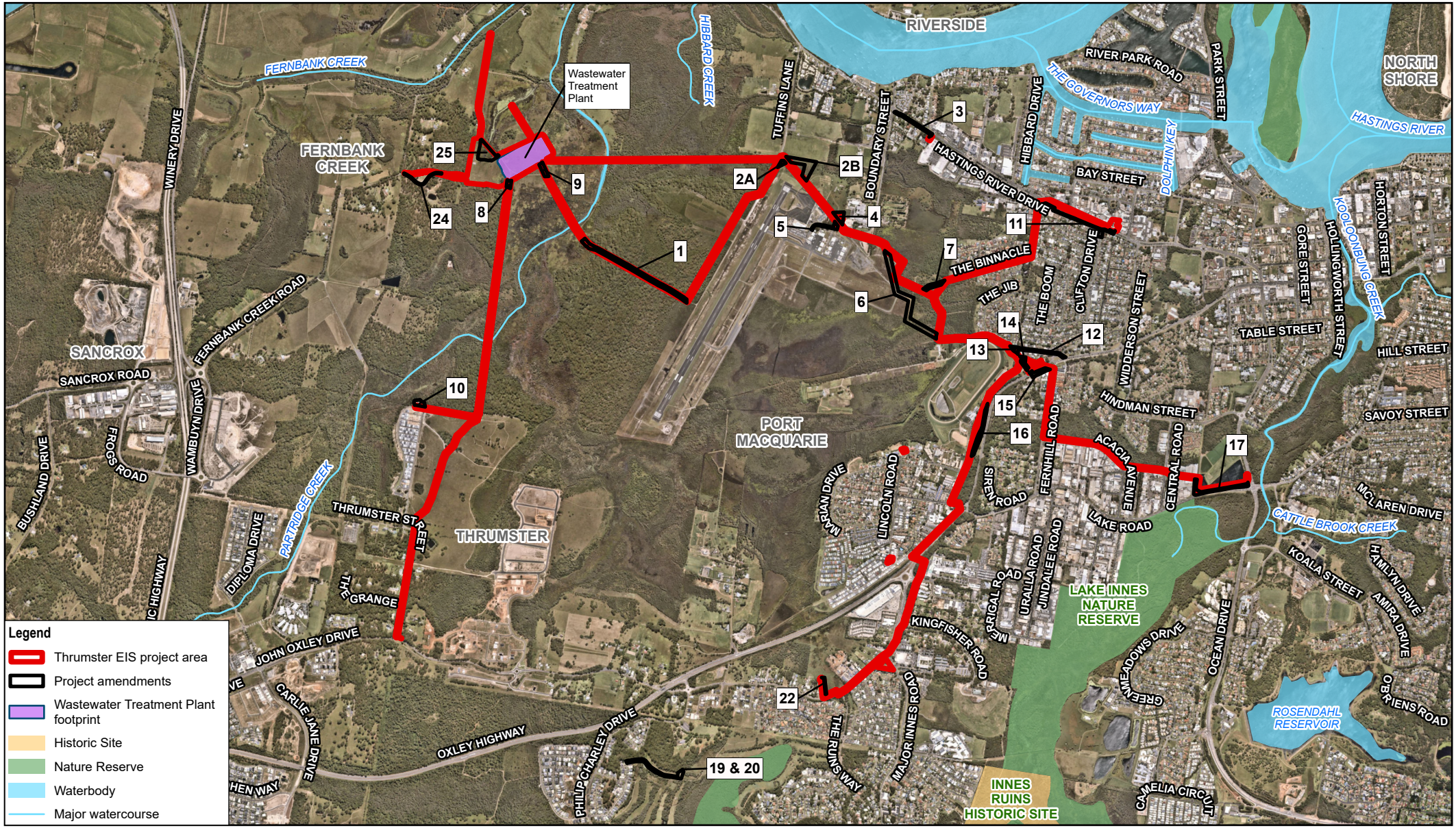
Mitigation measures proposed for the project are detailed in Appendix B. An overview of the project to provide context is set out in Section 3.1.

Table 3.1 Project amendments

Area	EIS footprint	Change to project footprint
1	Section of sewer rising main extending from the western boundary of the Airport towards Partridge Creek. This pipeline segment was proposed to be installed by open trenching and the disturbance footprint restricted to 6 m to minimise impacts to terrestrial and aquatic biodiversity within the broader 20 m project application corridor for the EIS.	Due to the development of design, the full corridor width in this location is required for all environmental investigations. This is to facilitate services and construction activities including vehicle movements and material handling. The change specifically relates to biodiversity assessment and offset calculations to increase the corridor width in this location from 6 m to 20 m.
2A	Section of sewer rising main and water main proposed to be installed around the north-western corner of the Airport. The pipeline segments were proposed to be installed by open trenching.	This minor amendment involves a small extension of the project footprint to the south of the proposed alignment. This is required to ensure the combined services corridor can be constructed without impacting on Crown Land (Crown Road adjacent to the southern end of Tuffins Lane).
2B	Combined services were proposed to be installed along Tuffins Lane near the northern boundary of the Airport through open trenching.	Ongoing consultation with the Airport during the development of detailed design has resulted in a small amendment to the pipeline alignment. This additional section is required to avoid construction of new mains within the airport Runway End Safety Area (RESA). Installing new services within the RESA is a difficult undertaking due to safety constraints associated with working within the RESA. It may also pose safety and operational concerns for maintenance of the assets in the future within the RESA. This would be alleviated with the revised design and reduce safety and operational concerns.
3	Upgrade to sewer pump station 23 (SPS23) was proposed. This is located on Hastings River Drive, within the industrial area. An existing sewer main was proposed to be reused for this SPS23 upgrade (not included in project).	Due to the development of design, a new section of sewer pipeline is required to be included in the project footprint to connect SPS23. The proposed sewer main would be trenched on road verge, along Hastings River Drive to the Boundary Street intersection. The existing sewer main that was proposed to be reused for SPS23 is an aged ductile iron pipe system (DICL) main within acid sulphate soils and as such there are concerns for the reliability of the main and is susceptible to failure and ongoing maintenance issues. Therefore, the sewer main would be replaced as part of this project from the SPS23 site.
4	A new sewer pump station (SPS87) was proposed in the EIS to the west of Newman Senior Technical College. This was proposed with a small construction compound. This is located adjacent to Tuffins Lane, where the return effluent pipeline and sewer rising main are proposed (trenching).	Due to the development of design, the project footprint is required to be extended for construction of the new sewer pump station (SPS87). This will provide additional space required for the construction laydown and associated equipment.
5	There was no works proposed in this section as part of the EIS.	Due to the development of design, a new section of power main is required. This power main would be installed via trenching. This area is in a highly industrial area and would follow an existing road (Oliver Drive).
6	A sewer rising main was proposed via open trenching along Tuffins Lane, following a southeast trajectory towards the Port Macquarie Racecourse. The EIS project footprint did not cover Area 6.	As a result of design development and consultation with the Port Macquarie airport regarding their future land use planning, a project amendment has been made to modify this section. The sewer rising main in Area 6 is on a modified alignment to that proposed in the EIS. The construction method for the proposed amendment is trenching.
7	The proposed sewer rising main was located via open trenching along existing access tracks within the Biobanking site. One main would be trending towards The Binnacle and the other towards Lady Nelson Drive.	This minor amendment is proposed following consultation with agencies to remove the impact on the BioBanking Site. This section is proposed to be modified to allow SPS07 sewer rising main to carry from the western end of The Binnacle through to Boundary Street. The proposed construction method would remain as open trenching.

Area	EIS footprint	Change to project footprint
8	This area is located to the south of the proposed WWTP. This section of recycled water main was proposed to be installed by HDD and the disturbance footprint restricted to 6 m to minimise impacts to terrestrial and aquatic biodiversity within the broader 20 m project application corridor for the EIS.	Due to the development of design, the full corridor width, of 20m in this location is required. This is to allow sufficient room for establishment and excavation of pits for Partridge Creek HDD crossing. The change specifically relates to biodiversity assessment and offset calculations to increase the corridor width in this location from 6 m to 20 m.
9	This section of sewer rising main was proposed to be installed by HDD and the disturbance footprint restricted to 6 m to minimise impacts to terrestrial and aquatic biodiversity within the broader 20 m project application corridor for the EIS.	Due to the development of design, the full corridor width, of 20m in this location is required. This is to allow sufficient room for establishment and excavation of pits for Partridge Creek HDD crossing. This is also required to allow for the TS01 sewer rising main cut-over works to the proposed WWTP. The change specifically relates to biodiversity assessment and offset calculations to increase the corridor width in this location from 6 m to 20 m.
10	This area was not proposed or assessed as part of the EIS. The location for Area 10 is to the north of Glenfern Ave which is part of the new Glenfern – Over 50's Lifestyle Community.	Due to the development of design, sewer pumping station TS01 requires upgrade works. This minor amendment would be added to the project footprint. It is located to the north of and adjacent to the proposed power and communications line to be installed via open trenching.
11	Section of sewer rising main was proposed to be installed via open trenching. This is proposed within the road reserve on the northern side of Hastings River Drive.	Due to the development of design, the sewer rising main has been changed from the north to south side of Hastings River Drive. This is to minimise the impact to existing services and traffic flows. The proposed amendment would make use of the existing service road that runs parallel with (and on the southern side of) Hastings River Drive. The proposed construction method would remain as open trenching.
12	Area 12 was not included as part of the EIS project footprint. The location is along Lady Nelson Drive, crossing over Clifton Drive.	This amendment area is required to enable the airport watermain connection point to the existing DN300 watermain. This is adjacent to the Clifton Drive and Oxley Highway intersections. The new airport watermain will then head west along Lady Nelson Drive before realigning with the original EIS corridor. Construction method would be open trenching.
13	Area 13 is located to the south of Lady Nelson Drive, in an industrial location and has not been assessed as part of EIS.	The proposed minor amendment requires a new sewer rising main to connect to sewer pump station 29 (SPS29) and would be installed via open trenching. This is to provide reliable and unimpeded access to SPS29 during operation of the Port Macquarie Race Club and construction works associated with nearby proposed development.
14	Area 14 is located between the Port Macquarie Race Club and the Oxley Highway. This area is proposed for a new pump station and carpark (SPS 29).	A minor amendment is required to expand the SPS area required to allow for the construction works associated with SPS29.
15	Section of return effluent main (via open trenching) was proposed from the north eastern corner of the racecourse (proposed SPS29) in a straight line to Fernhill Road / Oxley Highway roundabout.	This amendment would involve the return effluent main (via open trenching) to be located on a slightly different alignment to the south of the proposed, to avoid vegetation. This section of the corridor along Oxley Highway is to be widened to allow continuation of the return effluent main.
16	Section of sewer diversion main proposed via open trenching located in north south alignment adjacent to the east of Port Macquarie Race Club.	The minor amendment is due to stakeholder engagement with the Port Macquarie Race Club regarding the alignment of the sewer rising mains through the racecourse land. It was identified that the originally planned route would impact the daily operations of the race club, impact on race meet days, as well as unnecessarily encumber land that the race club may use for future infrastructure to support their business. Therefore, this amendment has moved the sewer rising main (via open trenching) further to the east (closer to the Oxley Highway), to avoid operational issues of the race club.

Area	EIS footprint	Change to project footprint
17	Section of return effluent pipeline was proposed in the access track along the top of the effluent pond embankment. This area is parallel to Lake Road and within Council's fenced facility.	This amendment has been identified through development of detailed design. Due to potential safety risks associated with design adjacent to embankment, the new return effluent pipeline is now proposed to be located within the road reserve along Lake Road and Barton Crescent, outside of the fence, on road verge.
19 and 20	This location is south of the Oxley Highway, off Black Caviar Parade. Area 19 and 20 are new areas and have not been previously included in the EIS.	This minor amendment is required to facilitate minor construction works to the SPS80 site within the already disturbed footprint of SPS80. No vegetation removal would be undertaken at this site. The existing gravel vehicle access track SPS80 would be upgraded. No disturbance would be undertaken outside the existing access track.
24	The proposed design for the flood free access road was approximated in the EIS and was roughly a straight line through private property.	Two alternatives are now proposed as ongoing discussion with landowner is still underway. Therefore, consideration of both options for the flood free access road is being considered for assessment in the Amendment Report.
25	A large construction compound area was proposed in the EIS adjacent to the WWTP and within wetland areas to the north east.	As an outcome of agency consultation and to reduce environmental impacts, a reduction of the construction compound area is proposed. This amendment includes a modification of the proposed compound/laydown area to the east of the proposed WWTP site to predominantly avoid the mapped Coastal Wetlands along Partridge Creek. BCS recommended that the project area required for site compounds and laydown areas be reduced to prevent further impacts on potential Giant Dragonfly habitat.



Paper Size ISO A4

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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

GHD

Port Macquarie-Hastings Council
Thrumster Wastewater Scheme
Submissions Report

Project No. **12611129**
Revision No. **0**
Date **30/03/2025**

Project amendments

FIGURE 3.1

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Data source: PMHC: Infrastructure data, 2023; BECCA: WTP Design, 2024; Geoscience Australia: 250k Topographic Data Series 3, 2006; LPI: DTDB / DCDB, 2023; Nearmap WMS Server: Aerial imagery - date extracted 12/10/2023.
Created by: fmackay

3.3 Additional community and stakeholder engagement since EIS exhibition

Additional consultation undertaken following the exhibition of the EIS included community pop-up sessions arranged by Council, and publishing information throughout news sources (online). Following this consultation, further clarification has been requested from local residences regarding potential odour impacts.

Council will continue to consult with the community during construction and operation of the project.

4. Response to submissions

This chapter provides a summary of issues raised by government authorities and initial response to issues raised.

4.1 Individual submissions

Submissions received by individual members of the community are made up of the following:

– Sixteen (16) submissions in total:
  - Nine (9) in support
  - Two (2) comment
  - Five (5) objections

Table 4.1 Individual submissions and response table

Submitter	Sentiment	Date	Details of submission	Response
Port Macquarie Race Club	Comment	29/08/24	The PMRC identified the following areas of concern: – The notification and consultation process with the Port Macquarie-Hastings Council and associated contractors. – The location and associated infrastructure of the upgraded Sewer Pump Station (SPS 29). – The alignment of the Sewer Rising Main and Sewer Gravity Main. – Associated concerns with development near a thoroughbred training/racing facility, including disruption and inability to conduct the business efficiently.	The Race Club was first briefed on the proposal in June of 2022 which was nine months prior to the submission of the scoping study and request for SEARs for the project. Communication and consultation channels were set up and open from June 2022. The location of the proposal is described in the EIS along with an explanation of the eventual selection of the site after considerable research and a multi-criteria analysis. The EIS describes the assessment of relevant environmental impacts including air quality, water quality, flooding, traffic, noise and vibration, in consideration of neighbouring sensitive receivers such as residents and business operations. Council is committed to working closely with the Club to minimise impacts during construction and operation. For example, following consultation with the Port Macquarie Race Club, design of the project has been moved further away from the Race Club. These changes are discussed in Section 3.2, shown in Table 3.1 and would be further described in the project Amendment Report (to be submitted separately to the DPHI). The mitigation of potential impacts is also included in the EIS, with no residual impacts expected that would affect the Race Club. Additionally, we recognise the importance of maintaining clear and safe access points for the Race Club operations. We will make every effort to ensure that access to critical areas and other essential entry points, remains unobstructed and safe throughout the construction period. Our Environmental Construction Management Plan will address concerns by implementing measures to safeguard access and mitigate impacts on the operation of the facility. We are committed to maintaining open communication with the Race Club throughout the project and will make adjustments as necessary to align with operational requirements and safety standards.
King & Campbell Pty Ltd	Support	2/09/2024	King & Campbell Pty Ltd endorses the project for the following reasons: – The project is justified as it is aligned with relevant state, regional and local plans. – The project would improve the reliability of wastewater infrastructure. – The project is superior to a do-nothing approach. – The project appropriately addresses key issues.	Council appreciates the support in line with our stated goals and need for the project.

Submitter	Sentiment	Date	Details of submission	Response
King & Campbell Pty Ltd on behalf of Swingaway Pty Ltd	Support	2/09/2024	Swingaway Pty Ltd is supportive of the project due to the anticipated population increase predicted for the Port Macquarie LGA which would be serviced by the Thrumster Wastewater Scheme.	Council appreciates the support in line with our stated goals and need for the project.
King & Campbell – on behalf of Mr Shore, Mr and Mrs A and A Hudson and Mr and Mrs D and T Hore	Support	2/09/2024	The submission is in support of the Thrumster Wastewater Scheme given the anticipated population increase predicted for the Port Macquarie Hastings Local Government Area (LGA) to 2046 which would be serviced by the Thrumster Wastewater Scheme.	Council appreciates the support in line with our stated goals and need for the project.
King & Campbell on behalf of Expressway Spares Pty Ltd	Support	2/09/2024	Expressway Spares Pty Ltd is supportive of the project due to the anticipated population increase predicted for the Port Macquarie LGA. Additionally, the Thrumster Wastewater Scheme is essential catalyst infrastructure for well-located employment lands such as the part of the ES Landholdings which have been identified for investigation as future employment lands.	Council appreciates the support in line with our stated goals and need for the project.
King & Campbell on behalf of Alceon Group	Support	2/09/2024	Alceon Group is supportive of the project due to the anticipated population increase predicted for the Port Macquarie LGA which would be serviced by the Thrumster Wastewater Scheme.	Council appreciates the support in line with our stated goals and need for the project.
Debra King	Object		This resident is located approximately 500 m from the proposal and objects to the proposal due to the following reasons: – Odour and air pollution when operating. – Microorganisms and viruses and micro toxins released from waste water system will threaten health of closest residents. – Pollution of environment with PFAS chemical. – Pollution of Pristine Waterways. – Safety of school children walking home from school. – Conduct of Port Macquarie Council employees and contractors.	<u>Air quality response:</u> Detailed assessment of odour and air pollution is provided in the air quality report including odour dispersion modelling in accordance with EPA Approved Methods. Recommended mitigation measures are described in Section 5 to minimise impacts on the surrounding environment. Predicted concentrations complied with the criteria at all receptors for all modelled scenarios, including the scenario with no OCU installed. Increased use of the OCU indicated reduced odour impacts at the receptors. Provision for implementation of an OCU will be included in the final design which will provide additional mitigation of odour emissions if deemed required based upon ongoing monitoring of the performance of the WWTP.

Submitter	Sentiment	Date	Details of submission	Response
[redacted]			The resident requests further assessment and consideration of how the proposal can minimize environmental pollution to both air and water for surrounding residents.	Microorganisms and viruses: Bioaerosols have not been specifically considered in the assessment for this project for the following reasons: – Most of the processes within the plant are contained within structures (i.e. tanks, vessels and pipes). – The only outdoor storage of wastewater will be in the emergency storage pond which will only store wastewater during large rain events to manage the flow through the plant. – This outdoor storage pond is not going to have aeration – i.e. where air is bubbled through the water in the pond to keep oxygen levels at appropriate levels. Given that most of the treatment processes occurs within structures there is no pathway for bioaerosols to form and to then escape to the atmosphere and leave the site. Enclosing the processes has also improved conditions for the workers at these facilities by limiting their exposure to bioaerosols. Bioaerosols guidelines: There are no guidelines or standards to address this matter due to limitations in the measurement techniques for bioaerosols. Instead, this matter is addressed via the design of the facility – i.e. ensuring the wastewater moves through the treatment processes within structures and ensuring appropriate buffers around the WWTP. Reference to 2022 journal article references by D and A King: As noted in the article, much of the formation of bioaerosols occurs via turbulence – e.g. during the flushing of the toilet (see figure 2 in the paper). If turbulence via aeration or other action within the plant does not occur in the open air (i.e. open top tanks or large-scale ponds) then even if bioaerosols form they remain inside the structures of the plant (i.e. inside tanks and pipes) and move with the wastewater through the plant. It is also important to note that bioaerosols are fine droplets of water and, while they are small, they are not as small as fine dust. They do have some weight to them, and they settle out of the air over quite short distances. They do not travel long distances. This is the basis of the requirement for suitable buffer distances around such facilities.

Submitter	Sentiment	Date	Details of submission	Response
[redacted]				<u>Enterococci counts:</u> In response to the submission regarding Enterococci counts, the following is provided: – The enterococci values listed in Table 5.2 on page 35 are those for existing water quality within Fernbank Creek and Partridge Creek. These values do not consider any potential changes in existing water quality due to the new project. – Table 5.3 on page 38 and Table 5.4 on page 39 both indicate the expected water quality for the water to be discharged by this project. – Table 5.3 specifically lists the expected water quality for fully treated effluent under normal conditions. The expected enterococci levels in this fully treated situation is 100 CFU/100mL. This water is discharged into Kooloonbung Creek and mixed into flowing water. The water quality modelling has indicated that discharging the volume of water expected for this facility with this concentration of enterococci will not noticeably change the levels of these organisms in Kooloonbung Creek. – Table 5.4 lists the expected concentrations of enterococci during emergency discharge situations – i.e. in flood conditions. In this type of situation, there will not be sufficient time to undertake full treatment of the wastewater which is why a higher level of enterococci is listed. In this type of situation, there is also considerably more water flowing through all of the creeks. Discharges that might occur if the stormwater storage pond should ever overflow will be mixed into a very large volume of water which is why it is considered that the change in levels of enterococci will only be small. – It is correct that, if enterococci levels in the water to be discharged under normal conditions were 30,000-50,000 CFU/100mL, this would make a significant change to the levels of these organisms in the various creeks. The reason that this is not the case is because full treatment (which would be the case for the normal situation) reduces the levels of enterococci significantly and also because overflow from the stormwater storage pond is not expected to occur except in the most extreme flooding conditions. <u>Pollution of environment with PFAS:</u> The Health Impact Assessment completed as part of the EIS has concluded that contamination of soil with per and polyfluoroalkyl substances (PFAS) is unlikely in the project area.

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				PFAS in wastewater biosolids originates from leachate received from landfill waste facilities. Testing at the Port Macquarie WWTP has detected low levels of PFAS in the biosolids; however, these are not stored on-site and are safely transported off-site in contained trucks, in compliance with environmental regulations. The biosolids are then processed at the Cairncross Waste Facility. It is important to note that the Thrumster WWTP will not be receiving leachate from any landfill facilities, significantly reducing the risk of PFAS contamination. Council conducted testing of our water supplies for each of our catchments in 2019 after PFAS was discovered in a water supply dam elsewhere in Australia. None of these chemicals, or the identified precursor chemicals were found. The risk is identified as extremely low given our location and the industry types that operate in our area. Council conducts regular testing of our recycled water and none of these contaminants of concern have been identified in our recycled water supplies. Council has also been undertaken sampling and testing of groundwater from five (5) groundwater monitoring bores around the proposed Thrumster WWTP site. This includes testing for PFAS. None of these chemicals, or the identified precursor chemicals were found in the groundwater samples. This testing will continue during construction and operation of the WWTP. Pollution of waterways: Modelling concludes that there would be no unacceptable impacts in relation to water. The stormwater storage pond is also sized for population growth out to 2070 and so has redundant capacity for decades to come. The inlet screen has a capacity to receive up to 852 litres per second, which is more than 200 litres per second more than the sewage pumping system's capacity to pump to the plant. This means that even in the worst case, screening and sedimentation – primary treatment of the wastewater - will be provided. Pedestrian and cyclist safety: Council will provide clear sightlines for school children, cyclists and pedestrians from Fernbank Creek Road and Hastings River Drive intersection to 433 Fernbank Creek Road. During construction the traffic management plan will look to implement a restriction on deliveries to the site aligned with the school bus schedules.

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[redacted]				<u>Conduct of Council employees and contractors:</u> The engagement undertaken in preparation of the Environmental Impact Statement (EIS) has adhered to the "Undertaking Engagement Guidelines for State Significant Projects" (NSW DPHI 2022) and responded to the Secretary's Environmental Assessment Requirements (SEARs). Council and GHD has consistently engaged with nearby residents and communities regarding the project. Feedback and concerns have been incorporated into the design. We have coordinated the timing of engagement sessions to ensure that information, designs, and technical studies were sufficiently progressed to facilitate meaningful discussions on relevant topics. Meetings were held regularly, and information was made available as it was developed. Although the concept design of the TWWS was not finalised until July 2024, the first engagement session with nearby residents was conducted on October 10, 2023. We received feedback after the initial meeting indicating that the preliminary information provided was not detailed enough and that there were requests for final EIS assessment reports. In response, GHD and Council worked as quickly as possible to share information as it became available. Interim reports, including key sections such as the dispersion model results, were shared to address specific concerns, particularly regarding odour management, which was a major focus of the community's feedback.

Submitter	Sentiment	Date	Details of submission	Response
Hugh Smith	Object		The resident objects to the proposal on the basis of odour and requests that the Thrumster Plant Inlet Works be fully enclosed such as the Farley Plant and Morpeth Plant. The resident states that as the Inlet Works are rated a 40+ on the odour scale, there would be large impacts to amenity and future property value. The resident also notes that the plant tour of Farley Plant is not comparable to the Thrumster Wastewater Scheme because Farley Plant has fully enclosed Inlet Works.	<u>Air quality response:</u> A specific odour emission rate of 40.75 OU.m/s was applied for the inlet works and septage receival for the worst-case design scenario which did not include an OCU. This emission rate includes a peak-to-mean factor, which is a conversion factor that adjust dispersion model predictions to the peak concentrations perceived by the human nose. Odour modelling undertaken as part of the air quality assessment indicated compliance with odour criteria at all nearby receivers. The treatment plant will run at just 25% capacity at the time of commissioning and will gradually reach its initial capacity (40,000EP) for stage 1 in 2045- 2050. Predicted concentrations complied with the criteria at all receptors for all modelled scenarios, including the scenario with no OCU installed. Increased use of the OCU indicated reduced odour impacts at the receptors. Council will carefully consider odour propagation to the nearby residences in the detailed design phase of the project. Council is undertaking detailed design of the OCU and including provision for the OCU as part of the final design, which will provide additional mitigation of odour emissions if deemed to be required. The cover on the inlet works is normally installed to capture gasses from the inlet works and direct to an OCU. The installation of cover without the OCU can erode the inlet works infrastructure and reduce the life of the infrastructure.

Submitter	Sentiment	Date	Details of submission	Response
Simon Seidenman **Michael Munday** **Robert Hough** **Fernbank Creek Residents**	Comment		The resident expresses alignment with the overall objectives of the proposal, however, has concerns about water inundation. The resident states that Fernbank Creek has diminished capacity, resulting in loss of land due to rising water levels. The resident expresses concern regarding having wastewater overflow entering Partridge Creek and Fernbank Creek. The resident describes the narrow nature of Fernbank Creek, which already features hazardous intersections. School children walk along this road, representing a safety risk. The residents request that the road is upgraded in order to support the traffic associated with construction of the proposal. The resident questions the management of stormwater due to increased concrete placement within and around the project site. The resident asks about any plans to dredge Fernbank Creek in order to help manage water flow. The resident asks about measures to prevent raw sewage from contaminating local waterways. The resident asks about potential health and environmental hazards associated with the proposed plant.	As a result of initial discussions with near neighbours to the proposal, the Return Effluent location was re-designed and moved several kilometres further away from Partridge Creek to Kooloonbung Creek. The only scenario in which Partridge Creek or Fernbank Creek would now be impacted is in the event of a major flood inundating the entire area. Incoming flows exceeding the treatment capacity of 4 x average dry weather flow (ADWF) at the design horizon will initially be held in the 25 megalitre capacity emergency storage pond and only once the emergency storage pond is full there will be a potential overflow to the Partridge and Fernbank creek systems. Any overflows will be restricted to high rainfall events and will be subject to considerable dilution. Council will provide clear sightlines for school children, cyclists and pedestrians from Fernbank Creek Road and Hastings River Drive intersection to 433 Fernbank Creek Road. Road access will require upgrading to allow for the construction of the plant. Rainfall within the fence line (the site) would be captured and treated in the WWTP process and discharged to Kooloonbung Creek or the recycled water reticulation network. Modelling concludes that there would be no unacceptable impacts in relation to water. The emergency stormwater storage pond is sized for population growth to 2070 and so has redundant capacity for future decades. This would reduce the likelihood of any emergency discharge to Partridge and Fernbank Creeks. Dredging is under the jurisdiction of the NSW Government and so outside of the scope of this project. The inlet screen has a capacity to receive up to 852 litres per second, which is more than 200 litres per second more than the sewage pumping system's capacity to pump to the plant. This means that even in the worst case, screening and sedimentation – primary treatment of the wastewater - will be provided. The Health Impact Assessment concluded that impacts to community health are unlikely. The NSW EPA will provide an environmental protection licence (EPL) which will need to be adhered to by Council. Water quality monitoring data will be published on Council's web site.

Submitter	Sentiment	Date	Details of submission	Response
Name withheld	Support		*I would like to advise that I support the project. Major projects such as these will always result in negatively affecting a small number of people and this unfortunately has to be managed appropriately, but this town has a record of pandering to small groups with loud voices, hence why I am taking the time to register support for a very important development. Without this, growth of the town will be severely hampered, which would have a significant, negative impact on just about everyone. The provision of new waste water treatment facilities is an urgent infrastructure priority and this location is any to service a significant growth area of this town.*	Council appreciates the support in line with our stated goals and need for the project.
Name withheld	Support		*This is long overdue and needs to be urgently fast tracked. It is holding up important rezoning in the town like the Health and Education precinct area as well as other infill development needed to address the community's health, education, childcare, university accommodation and essential worker accommodation.* *It is extremely urgent to fast track this development.*	Council appreciates the support in line with our stated goals and need for the project.
Hopkins Consultants	Support		*Hopkins Consultants are in support of this project. The Thrumster WWS is essential infrastructure to support the targets in Council's Housing Strategy. We encourage approval and commencement of this project at the earliest opportunity.*	Council appreciates the support in line with our stated goals and need for the project.
Geoff Freeman	Support		The submission is supportive of the proposal as a solution for both the existing Port Macquarie Sewerage Treatment Plant (STP) over capacity, plus allow for the ongoing growth and development of the Thrumster Urban Growth Area.	Council appreciates the support in line with our stated goals and need for the project.
Dr Adam King	Object		The submission objects to the project for the following reasons: – Misleading name of the project which is not located within Thrumster. – Lack of due diligence in considering alternative sites. – Flood proof access. – Rezoning of surrounding land to suit project location. – Threats of acquiring land without community consent. – Misleading site visit at a facility that is not like-for-like.	<u>Project name</u> The project name was based on the area of need that the project is primarily servicing, the project responds to increasing demand from the general Thrumster locale, among other expanding areas. The EIS Project Description defines the location of the treatment plant's site, as well as the pipeline infrastructure that includes Thrumster, Fernbank Creek and Port Macquarie.

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[redacted]			– Not benefitting local community as an infrastructure asset. – Misleading site visit whereby distance between site and receivers was made to seem further than it is. – Lack of consideration of impacts of odour and bioaerosols by having facility raised above ground level. – Lack of assessment of biological airborne hazards/ bioaerosols, microbes fungal spores and PFAS on human health. – Lack of consideration of the health impact of WWTP borne aerosol on humans. – Misleading odour fact sheet which did not clearly state odour impacts to nearby receivers. – No compensation for financial loss incurred by the devaluation of the affected properties and mitigation of odour and micro toxins/bioaerosols.	Alternative sites: Considerable effort has been expended in the site selection process, since the early establishment of the project in 2003-2004. Twenty-three investigations, studies and options evaluations were undertaken to consider the six sites considered to bring about the preferred location. Engagement with local community members brought about a slight change to the positioning of the site, and also a change to the discharge location. The Option Evaluation document has been made available on Council's website since early to mid-2024. Flood-free access road: First correspondence with the private landowner in relation to the flood free access/ emergency road commenced in July 2023, well before the Oct 2023 meeting. At this time, alternatives were discussed with the property owner. Council follows the NSW State government process of acquisition by agreement. Council has been mindful of the landowner's confidentiality regarding the documentation of floodproof access in its design materials during ongoing negotiations for access. Council has obtained the landowner's approval to include this concept in the EIS publication. The feedback we have received from the owner to date regarding the agreement process has been positive. Rezoning of surrounding land: The amendment to the zoning of land surrounding the project site commenced in 2015 and was finalised in 2020 (public exhibition was 29 January to 26 February 2020). This was related to the bio certification of land in proximity to the airport (not the Thrumster Wastewater Scheme or its site) which was approved by the NSW Minister in 2018, and the planning proposal was for a potential Business Park zoning at the Port Macquarie Airport. The amendment increased the amount of Environmental Conservation zone (E2) land in the proximity of the project site. Land acquisition: Information regarding correspondence with the private landowner in relation to the flood free access has been provided above. Council follows the NSW State government process of acquisition by agreement. There is no provision or requirement for acquisition of the land beside the land required for the flood free access road that is ongoing based on agreement with the landowner.

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				Site visit: In relation to the tour of the plant in Maitland, the main objective in offering to facilitate this tour was to provide residents with a real-world experience of a plant with a similar treatment process and capacity and to review its components and hear first-hand from the operator of this plant. The tour of an operational wastewater treatment plant was requested by some of the Fernbank Creek residents at the near neighbour's engagement session Council held in May 2024. The Farley Plant was selected as the closest similar plant noting its environmental setting is not going to be the same as Thrumster Plant. Council acknowledge that there are differences in the site and environmental specifics surrounding the Farley plant and would also like to note that the Farley plant is currently servicing around 60,000 people while Thrumster will initially service 18,000 people which is 25% of its stage 2 design capacity of 80,000 people. Council will carefully consider odour propagation to the nearby residences in the detailed design phase of the project. An OCU will be included in the final design which will provide additional mitigation of odour emissions if deemed required based upon ongoing monitoring of the performance of the WWTP. Benefits to the local community: – Connection to services Changes to residents' access to sewer and water connections are generally not within the scope of this project. These decisions are typically governed by broader strategic planning processes, including rezoning. The expansion of the reticulated gravity sewer network is also not part of the scope of the project, so sewer servicing for the neighbouring properties is not being considered. The project team is however exploring the feasibility of providing water connections to properties that are near neighbours to the plant. Such water connections will come with implications that need thorough exploration. Like any new water or sewerage infrastructure, head works charges, which are one-time fees collected to recover costs, would be incurred, and waiving these fees would require special approval from the Council.

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[redacted]				Under the Local Government Act in NSW, property owners are required to pay annual fees or charges for water services provided to their property, even if they choose not to connect to the water supply infrastructure. This ensures that the costs associated with maintaining and providing the infrastructure are equitably shared among all properties within the service area, regardless of their individual connection status. It would not be possible for these annual fees and charges to be waived. Achieving a unanimous consensus from the group regarding the matter of water connection will be necessary, given these implications. <u>Distance from the plant to the nearest residence:</u> The distances measured for modelling were undertaken using online mapping tools. Distances were provided in the EIS and the Concept Design. <u>Air quality response:</u> Dispersion modelling includes heights of each source: – The odour control unit was modelled as a stack source with a height of 5 m above ground level. – The sludge loading was modelling as a volume source with a height of 12 m above ground level. During construction, the main potential for impact on air quality is the release of dust/particles into the air during earthworks. This is a common issue during most construction works (GHD 2024a). During operation of this facility, the main potential impact on air quality is the possibility of odours from the facility (GHD 2024a). <u>Biological airborne hazards:</u> There are no guidelines or standards to address this matter due to limitations in the measurement techniques for bioaerosols. Instead, this matter is addressed via the design of the facility – i.e. ensuring the wastewater moves through the treatment processes within structures and ensuring appropriate buffers around the plant. As noted in the article, much of the formation of bioaerosols occurs via turbulence – e.g. during the flushing of a toilet (see Figure 2 in the paper). If turbulence via aeration or other action within the plant does not occur in the open air (i.e. open top tanks or large-scale ponds) then even if bioaerosols form they remain inside the structures of the plant (i.e. inside tanks and pipes) and move with the wastewater through the plant.

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				It is also important to note that bioaerosols are fine droplets of water and, while they are small, they are not as small as fine dust. They do have some weight to them and they settle out of the air over quite short distances. They do not travel long distances. This is the basis of the requirement for suitable buffer distances around such facilities. <u>Odour Fact Sheet:</u> The odour fact sheet provides a summary and overview of the Air Quality Assessment. The information in the fact sheet was extracted directly from the Air Quality Assessment. The example referenced in the submission relating to stability is a direct excerpt of the Technical Report 8 - Air quality Assessment, page 19. The actual report goes on to detail each of the stability classes in Section 3.3.4. The image contained in the fact sheet is a direct excerpt from Figure 3.7 on page 20. <u>Compensation:</u> As all potential impacts have been modelled/assessed as either negligible or within existing guidelines there is no actual impact to seek compensation for.
Michael Potter	Object	4/09/2024	The resident raised the following concerns: – Issues during construction - given the project is likely to take 2+ years to complete, the impact in terms of noise, traffic and privacy will be quite high. – Dangerous intersection of Fernbank Creek Road and Hastings River Drive. – Long term noise, traffic and privacy concerns – with potential to reduce this impact by planting a tree line. – Flood risk. – Property access from Partridge Creek Road. – Potable water and sewerage, with the request that properties be connected to water mains. – Cattle management and the need to upgrade existing fencing. – Property value and perception, specifically requesting minimal signage and visual screening of the facility.	<u>Noise impacts during construction:</u> Noise impacts during construction have been assessed and a Noise and Vibration Impact Assessment (Technical Report 11) prepared assessed in accordance with the methods outlined in the NSW Noise Policy for Industry (EPA 2017), NSW Road Noise Policy (EPA 2011), and the Interim Construction Noise Guideline (NSW DECC 2009). To help manage the impact during construction, below are measures that have been included in the EIS to address this. <u>Traffic, transport and roads:</u> – The design would continue to be refined to avoid or minimise impacts to the surrounding road and transport network and property access, as far as reasonably practicable. – Council will provide clear sightlines for school children, cyclists and pedestrians from Fernbank Creek Road and Hastings River Drive intersection to 433 Fernbank Creek Road. – A traffic management plan (TMP) will be developed and implemented as part of the construction environmental management plan. The TMP is to include as a minimum: • Confirmation of haulage routes and access point. • Measures to maintain access and capacity to existing roads.

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[redacted]				• Measures to minimise conflicts with pedestrians and cyclists. • Traffic control measures including signage at appropriate locations to notify road users of increase traffic volumes. • A response plan for any construction related traffic incidents. • Consult with emergency services to ensure that procedures are in place to maintain safe, priority access for emergency vehicles. • Relevant traffic safety measures including driver induction, training, safety measures and protocols. • All personnel will be inducted on the requirements of the TMP. – Environmental control: All vehicles must have loads covered and secured, and be cleaned of debris before leaving the site, and operate without causing excessive noise or vibration. The lead contractor is responsible for monitoring and cleaning roads affected by site vehicles, ensuring public access remains unobstructed, and using water trucks to suppress dust as needed. All subcontractors must follow these procedures, which include induction by the lead contractor. – Construction zones and speed limits will be implemented. – A driver's code of conduct will also be implemented outlining expected behaviours, designated routes, speed limits and protocols. As well as sensitivity of near neighbours. – The primary site access road (sealed pavement) from Fernbank Creek Road to the Thrumster WWTP would be upgraded for construction vehicles include (including any upgrades to the intersection of the primary site access road and Fernbank Creek Road as required). A traffic management plan would be developed including reduced speed signage and other safety measure to avoid accidents and provide safe passage for vehicles. • All personnel must undergo environmental induction covering noise and vibration measures, license conditions, work hours, sensitive receptor locations, and incident procedures. • Use quieter construction methods, avoid unnecessary noise, and route vehicle movements away from sensitive areas. Maximize on-site storage to reduce truck movements and pre-fabricate materials off-site to minimize on-site noise.

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[redacted]				Construction noise: – Section 6 in the noise report provides all noise mitigation and management recommendations that would be adhered to during construction and operation to minimise impact upon nearby receivers. Management measures would include but not limited to: • Construction will occur during standard daytime hours when possible, with noisy or vibrating work scheduled for less sensitive times. Standard construction hours are: – 7am to 6pm Monday to Friday – 7am to 1pm Saturday – No work on Sunday and Public holidays Operational noise: – Operational noise is modelled at under 34 decibels, predicted at night and with a temperature inversion, which is known to potentially enhance noise – so this is considered a worst-case scenario. These predicted noise levels are below the minimum noise criteria of 35 dBA as per the Noise Policy for Industry. – Once fully operational it is anticipated that up to four full time employees would be required to manage the onsite operations at the WWTP. The results indicate that the relative increases in road traffic noise levels associated with the operation of the WWTP are predicted to be less than 0.5 dBA. These changes are compliant with the guidance contained in the RNP (DECCW 2011). Privacy: The proposed WWTP site is around half a kilometre from the closest residence and there is a range of vegetation including trees and bushes, which will assist in maintaining privacy. There is some indication of sight lines in the visual impact assessment which may provide some comfort in this regard. Construction of access to the site and pipelines are linear infrastructure that while taking some time to build, use a methodology that sees relatively temporary impacts at individual locations. Council would also consider planting a suitable tree line along the eastern boundary of the site. Flood Risk: Flood modelling was undertaken as part of the EIS, Technical Report 1A Water Resources and Flooding Assessment.

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				Council would provide suitable drainage along the access road from Hastings River Drive to the 433 Fernbank Creek Road. The final drainage and stormwater design for the access road to the WWTP will adhere to Aus-Spec design specifications and will consider the rate and volume of runoff before any construction work begins. The access road will incorporate the necessary drainage and maintenance of this will be managed accordingly, to ensure its effectiveness. <u>Property Access:</u> Council will maintain property access during construction and operation. The project team are reviewing access requirements and will consult with local residents in relation to access between nearby properties and Partridge Creek. <u>Cattle management:</u> The project team are reviewing fencing requirements relating to the plant and its associated access roads and will consult with local residents accordingly in relation to this. Council anticipated to pay 50% to upgrade the shared permanent fence along the eastern border to prevent cattle interference with construction traffic. <u>Property value and perception:</u> To ensure that the wastewater treatment plant is effectively integrated into the community with minimal visibility, Council is implementing several strategic measures. We will limit references to the plant's location in public communications and ensure signage is kept to a minimum, positioned as discreetly as possible, such as at secondary gates away from public view. These steps are designed to maintain the aesthetic and environmental quality of the neighbourhood. Council will also consider planting a suitable tree line along the eastern boundary of the site.
Elizabeth Dancet	Object	5/09/2024	The resident raised the following concerns: – Odour and air quality (impact of bioaerosols) given the dispersion of odour by wind patterns as well as the distance between the proposal and this resident in light of recent Northern Territory guideline changes. – Risk of drinking water (roof collection) being contaminated by bioaerosols. – Request to be connected to town water via annual access fee.	<u>Air quality response:</u> Dispersion model follows NSW EPA guidance and odour impacts above the guidelines are not predicted. The dispersion model considers all wind conditions over a 1-year period. A specific odour emission rate of 40.75 OU.m/s was applied for the inlet works and septage receival for the worst-case design scenario which did not include an odour control unit. This emission rate includes a peak-to-mean factor, which is a conversion factor that adjust dispersion model predictions to the peak concentrations perceived by the human nose.

Submitter	Sentiment	Date	Details of submission	Response
[redacted]			– Road safety impacts to Fernbank Creek Road during construction due to increased construction traffic requiring potential road upgrades. – Noise and dust pollution during construction. – Devaluation of nearby properties and loss of amenity. – Potential compensation for the loss of property value.	Odour modelling undertaken as part of the air quality assessment indicated compliance with odour criteria at all nearby receivers. The treatment plant would run at about 25% capacity at the time of commissioning and would gradually reach its initial capacity (40,000EP) for Stage 1 in about 2039. Predicted concentrations complied with the criteria at all receptors for all modelled scenarios, including the scenario with no OCU installed. Increased use of the OCU indicated reduced odour impacts at the receptors. Council will carefully consider odour propagation to the nearby residences in the detailed design phase of the project. Council is undertaking detailed design of the odour control unit and including provision for the odour control unit as part of the WWTP layout. An OCU will be included in the final design which will provide additional mitigation of odour emissions if deemed required based upon ongoing monitoring of the performance of the WWTP. Drinking water and bioaerosols: Bioaerosols have been addressed in the response above Connecting to services: Changes to residents' access to sewer and water connections are generally not within the scope of this project. These decisions are typically governed by broader strategic planning processes, including rezoning. The expansion of the reticulated gravity sewer network is also not part of the scope of the project, so sewer servicing for the neighbouring properties is not being considered. The project team is however exploring the feasibility of providing water connections to properties that are near neighbours to the plant and that can be gravity-fed via the pipeline supplying water to the plant. Such water connections will come with implications that need thorough exploration. Like any new water or sewerage infrastructure, head works charges, which are one-time fees collected to recover costs, would be incurred, and waiving these fees would require special approval from the Council.

Submitter	Sentiment	Date	Details of submission	Response
[redacted]				Under the Local Government Act in NSW, property owners are required to pay annual fees or charges for water services provided to their property, even if they choose not to connect to the water supply infrastructure. This ensures that the costs associated with maintaining and providing the infrastructure are equitably shared among all properties within the service area, regardless of their individual connection status. It would not be possible for these annual fees and charges to be waived. Achieving a unanimous consensus from the group regarding the matter of water connection will be necessary, given these implications. <u>Noise response:</u> Noise impacts during construction have been assessed and a Noise and Vibration Impact Assessment prepared assessed in accordance with the methods outlined in the NSW Noise Policy for Industry (EPA 2017), NSW Road Noise Policy (EPA 2011), and the Interim Construction Noise Guideline (NSW DECC 2009). To help manage the impact during construction, below are measures that have been included in the EIS to address this. <u>Traffic, transport and roads:</u> – The design will continue to be refined to avoid or minimise impacts to the surrounding road and transport network and property access, as far as reasonably practicable. – Council will provide clear sightlines for school children, cyclists and pedestrians from Fernbank Creek Road and Hastings River Drive intersection to 433 Fernbank Creek Road. – A TMP will be developed and implemented as part of the construction environmental management plan. The TMP is to include as a minimum: • Confirmation of haulage routes and access point. • Measures to maintain access and capacity to existing roads. • Measures to minimise conflicts with pedestrians and cyclists. • Traffic control measures including signage at appropriate locations to notify road users of increase traffic volumes. • A response plan for any construction related traffic incidents. • Consultant with emergency to ensure that procedures are in place to maintain safe, priority access for emergency vehicles. • Relevant traffic safety measures including driver induction, training, safety measures and protocols.

Submitter	Sentiment	Date	Details of submission	Response
				• All personnel will be inducted on the requirements of the TMP. – Environmental control: All vehicles must have loads covered and secured, and be cleaned of debris before leaving the site, and operate without causing excessive noise or vibration. The lead contractor is responsible for monitoring and cleaning roads affected by site vehicles, ensuring public access remains unobstructed, and using water trucks to suppress dust as needed. All subcontractors must follow these procedures, which include induction by the lead contractor. – Construction zones and speed limits will be implemented. – A driver's code of conduct will also be implemented outlining expected behaviours, designated routes, speed limits and protocols. As well as sensitivity of near neighbours. <u>Construction noise:</u> – Section 6 in the noise report provides all noise mitigation and management recommendations that would be adhered to during construction and operation to minimise impact upon nearby receivers. Management measures will include but not limited to: • Construction will occur during standard daytime hours when possible, with noisy or vibrating work scheduled for less sensitive times. • All personnel must undergo environmental induction covering noise and vibration measures, license conditions, work hours, sensitive receptor locations, and incident procedures. • Use quieter construction methods, avoid unnecessary noise, and route vehicle movements away from sensitive areas. Maximize on-site storage to reduce truck movements and pre-fabricate materials off-site to minimize on-site noise. <u>Operational noise:</u> – Operational noise is modelled at under 34 decibels, predicted at night and with a temperature inversion, which is known to potentially enhance noise – so this is considered a worst-case scenario. These predicted noise levels are below the minimum noise criteria of 35 dBA as per the Noise Policy for Industry.

Submitter	Sentiment	Date	Details of submission	Response
[redacted]				– Once fully operational it is anticipated that up to four full time employees would be required to manage the onsite operations at the WWTP. The results indicate that the relative increases in road traffic noise levels associated with the operation of the WWTP are predicted to be less than 0.5 dBA. These changes are compliant with the guidance contained in the RNP (DECCW 2011). <u>Property value:</u> To ensure the WWTP is effectively integrated into the community with minimal visibility, Council is implementing several strategic measures. Council would limit references to the plant's location in public communications and ensure signage is kept to a minimum, positioned as discreetly as possible, such as at secondary gates away from public view. These steps are designed to maintain the aesthetic and environmental quality of the neighbourhood. Council would also consider planting a suitable tree line along the eastern boundary of the site. <u>Compensation:</u> As all potential impacts have been modelled/assessed as either negligible or within existing guidelines there should be no actual impacts to seek compensation for.

4.2 DPHI

Comment

The DPHI made the following comment:

The Submissions Report (SR) must address the following issues identified by the Department:

– *All issues raised by government agencies in their advice.*
– *All issues raised in public submissions and feedback (feedback attached as Appendix B) by members of the public, interest groups and Council.*

Table 4.2 *outlines the key items and responses listed in the correspondence from DPHI.*

Responses

Table 4.2 DPHI Key Issues comment and response table

Key Issues	Comment		Response
Project description	*Please provide plans that show in sufficient detail the works which are proposed to be undertaken at, adjacent to or under all land. For example, will under boring be undertaken beneath any private property?*		Refer to Appendix C-7 which outlines the project component, impacted properties and construction type. Refer to Figure 3.1.
	Reference is made to an amount of wastewater that would be transferred to Council's existing wastewater treatment plant to the proposed Thrumster treatment plant for treatment to a higher level than available at the existing treatment plant: *1. How much wastewater would be transferred to the proposed Thrumster plant?* *2. Would this result in decreased discharges of less treated wastewater at Kooloonbung Creek?* 3. *What would the combined volume of wastewater that would be disposed of to Kooloonbung Creek from the existing treatment plant and the proposed Thrumster treatment plant?*		The Thrumster sewerage scheme includes a WWTP to provide treatment capacity for 40,000 EP and a design average dry weather flow (ADWF) of 9.2 ML/day. The WWTP provides capacity for treatment of flows up to 4 x ADWF or 36.8 ML/day. The WWTP has been designed to be expandable in the future to an ultimate capacity of 80,000 EP, with a design flow of 18.4ML/day. 4. The Thrumster WWTP will treat a portion (about 25%) of wastewater currently directed to Port Macquarie WWTP and service new connections from the Thrumster, Sancrox and Fernbank Creek development areas. 5. Yes, the Thrumster WWTP would operate with a higher treatment standard than the existing Port Macquarie WWTP. For the approximately 25% of the existing wastewater load that would now be treated at the Thrumster WWTP, the quality associated with those discharges would be improved. However, the overall discharge and loads into Kooloonbung Creek would increase, associated with the operation of both plants servicing a larger equivalent population. The WWTP treatment process includes a continuous bioreactor with submerged membrane separation or membrane bioreactor (MBR) providing mechanical and biological nutrient reduction in wastewater. 6. The combined volume of wastewater disposed of to Kooloonbung Creek is a combination from the existing Port Macquarie WWTP and the proposed Thrumster WWTP. a. Currently (at 2025), about 15.0 ML/d average flows discharge to Kooloonbung Creek (from Port Macquarie WWTP). b. Upon commissioning of Thrumster WWTP (at 2028), about 22.0 ML/d average flows would be discharged to Kooloonbung Creek. This would be a combination of both Thrumster WWTP and Port Macquarie WWTP. It is proposed that ultimately, about 25% of the sewage load from Port Macquarie WWTP will be transferred to Thrumster, progressively diverted to the WWTP from the commissioning date. c. Further details and relevant graph with average flow rates are provided in Appendix C-5.

Key Issues	Comment		Response
	Please provide an Environmental Risk Assessment that has been updated from when provided at the Scoping Report stage, and as required by the SEARs for inclusion in the EIS.		The initial step of the impact assessment process involved identifying key potential environmental issues, impacts and risks that would be subject to detailed assessment as part of the EIS. The SEARs identify the key issues as listed in Section 6.2 of the EIS. These were informed by the scoping report, which was prepared to support the request for SEARs in 2023. Notwithstanding the identified key issues, the environmental risk assessment has been updated to identify the potential risks of each environmental impact associated with the project. The environmental issues associated with the project were further refined as with 'key issues' or 'other issues.' This assessment is presented in Appendix C-3. The impact assessment and associated mitigation measures as shown in Chapters 7-23 of the EIS are in line with the SEARs and original scoping table. Chapter 24 of the EIS outlines the cumulative impacts from the project and includes a discussion on residual impacts. Chapter 25 of the EIS provides a synthesis of the results of the assessment and includes a compilation of the mitigation measures and assessment result that relate to the overall approach to environmental management of the project.
	Provide an updated Cumulative Impact Assessment that considers known projects beyond those listed on the Major Projects site. For example, has Council approved any sub-divisions that should be considered?		NSW Government Infrastructure projects and other major projects either underway or proposed near the project were considered. Cumulative impacts were considered where there was enough project information available and if there is likely to be an overlap in construction or operational impacts. A search of major projects (both on NSW major projects website and Council website) at the time of the EIS preparation was undertaken. The project itself is required to facilitate projected growth in Port Macquarie's outer suburbs and is required to be delivered in advance of residential sub-divisions to ensure adequate wastewater capacity to service growth areas Other current major developments in the surrounding area with potential to contribute to cumulative impacts (in addition to those identified in section 24 of the EIS), include the following: – Proposed Gordon Street Port Macquarie Affordable Housing (SSD-71373460) – at Gordon Street, in town at Port Macquarie close to the mouth of the Hastings River. Project is in progress of EIS preparation and not expected to overlap in footprint with the Thrumster Wastewater Scheme. Proposed project will involve construction of a residential flat building with approximately 94 new dwellings. – Proposed Rosewood Eco Park (SSD-64492477) – at Rosewood, Port Macquarie. Project is in progress of EIS preparation and is expected to be confined to existing quarry site; unlikely to overlap with the Thrumster Wastewater Scheme.

Key Issues	Comment		Response
Biodiversity	*Detail the proposed rehabilitation that would be outlined within a Vegetation Management Plan*		The BDAR specifically addresses the rehabilitation that is likely to occur within Section 8.10. This includes key monitoring and restoration tasks as detailed in Appendix C-6 (de Witt, 2025). Additional information will be defined in full as part of the Construction Environmental Management Plan. In general, the vegetation management plan will detail the following, – Specific locations where types of vegetation management and rehabilitation will occur. – Fencing. – Erosion and sediment control. – Vegetation clearing and civil works supervision. – Specific flora species mixes used for rehabilitation that are suitable for use around the pipelines and infrastructure. – The soil preparation methods. – Restoration approach. – Weed management methods – A timeline for works ensuring that the plan is performed for a minimum of 5 years. – Monitoring process and regularity.
	Any proposal to fund a biodiversity conservation action.		The project will not directly fund a conservation action. Rather, we understand Council will seek to purchase credits to offset impacts from the proposal, which will support biodiversity conservation measures in other locations.
	Confirm if a biodiversity stewardship agreement is required, and if so, provide the draft details of the agreement.		A biodiversity stewardship agreement is not required for this project and the proponent has confirmed that they will not be entering into a biodiversity stewardship agreement to support this project.
	Justify why and how works are proposed to be undertaken within the identified biodiversity stewardship site to the east of the airport.		Works were initially proposed to occur within an access track within the BioBanking site as this would reduce impacts to native vegetation. However, following further advice the project has been revised such that it remains completely within the Biocertified lands when in proximity to the Port Macquarie Airport. See Figure 3, Appendix C-6 for further details.
	Confirm if the project will impact on National Parks, or other sites protected for ecological reasons.		All areas of the project occur outside of the National Parks. Trenching will occur approximately 22 m away from the boundary of the Lake Innes Nature Reserve, separated by Lake Road. Discharge from the project will occur in Kooloonbung Creek approximately 620 m downstream from the Lake Innes Nature Reserve. The project is approximately 2.2 km from the Innes Ruins Historic Site.

Key Issues	Comment		Response
Aquatic ecology	*The wave and current regimes are not clearly addressed with regards to aquatic ecology. Provide additional information outlining wave and current in relation to impacts on aquatic ecology.*		Additional modelling has been performed by Intrawater using the previously prepared Water Quality Response Model (WQRM) (refer to Appendix C-1). A typical tidal cycle was simulated over four weeks during March 2016 to analyse contributions from the Wastewater Treatment Plant (WWTP) and tidal influences under baseline (circa 2023/24) and background (circa 2058) scenarios, focused on the Gordon Street Bridge in Kooloonbung Creek, approximately 1,600 m downstream of the discharge outlet. The results indicated: – Average tidal flow volumes per tide at Gordon Street Bridge with releases from the proposed Thrumster WWTP is predicted to result in an increase of 0.9 ML (~1.5%) for baseline scenarios and 1.0 ML (~0.9%) for background scenarios. – The average additional peak flow is predicted to be +0.103 m^3/s under baseline scenarios and +0.105 m^3/s under background scenarios. – The existing average peak flow without Thrumster releases were predicted to be 2.6 m^3/s for baseline scenarios (varying between 0.5-2 m^3/s during neap tides and 3-6 m^3/s during spring tides). – The existing average peak flow without Thrumster releases were predicted to be 4.3 m^3/s for background scenarios (varying between 1-4 m^3/s during neap tides and 5-9 m^3/s during spring tides). – Average increase in depth at the Gordon Street Bridge from releases from the proposed Thrumster WWTP is predicted to be ~5 mm for both baseline and background scenarios. The maximum increase in depth for baseline scenarios is predicted to be up to 50 mm and for background scenarios up to 40 mm. The results from the additional modelling indicate that the Thrumster WWTP releases are expected to have a generally limited influence on the flow and current regime in Kooloonbung Creek, in vicinity of the Gordon Street Bridge. Considering the minimal increases in average tidal flow volumes, additional peak flow and additional depth from the Thrumster WWTP releases, the minimal shifts in the current regime of Kooloonbung Creek are not expected to significantly impact on aquatic ecology. The timing and tidal flow volumes of water flowing through the lower Kooloonbung Creek is not predicted to significantly change, thus is not expected to detrimentally impact on the transport of sediments and nutrients or movement of biota in the creek. Additionally, changes will be limited to habitats within the tidal reaches of Kooloonbung Creek where estuarine biota are adapted to varying flow and water depths. Further information provided in Appendix C-2.
	Outline how surrounding land uses may affect the aquatic environment.		Fernbank Creek, Thrumster and Port Macquarie and the wider Port Macquarie-Hastings region encompasses a diverse range of land uses including significant areas of environmental conservation and management, primary production, residential, commercial, industry, tourism, recreation, infrastructure and some National Parks and Nature Reserves. A number of these land uses have potential to place ongoing or intermittent stress on surrounding aquatic ecosystems. Further information is provided in Appendix C-2 detailing the surrounding landuses of Partridge, Fernbank and Kooloonbung Creek.

<table>
<tr><th>Key Issues</th><th>Comment</th><th></th><th>Response</th></tr>
<tr><td rowspan="3"></td><td>The photos provided in Technical Report 6 are not at high and low tide as per the SEARs. Please update as required.</td><td></td><td>Survey sites investigated in the Technical Report 6 – Aquatic Ecology Assessment included seven sites within the tidal limit of Kooloonbung Creek (K01-K07) and one site at the estimated tidal limit of the Partridge/Fernbank Creek man-made connection (K08). Other sites at Partridge Creek are freshwater habitats above the tidal limit and not affected by tides (P09-P12). Photos facing upstream and downstream at high and low tide at the 8 sites noted are provided in Appendix C-2 (Appendix 1).</td></tr>
<tr><td>The cumulative impacts to aquatic ecology do not appear to have been adequately addressed. Aquatic ecology is not specifically addressed within Section 24 of the EIS and other developments and cumulative impacts are not addressed within the aquatic ecology assessments.</td><td></td><td>This response should be read in conjunction with Section 4.4– Response to relevant comments from NPWS, which addresses cumulative impacts associated with Kooloonbung Creek.
Cumulative impacts to aquatic ecology and other developments have been addressed in Appendix C-2, Section 2d.</td></tr>
<tr><td>Are any offsets proposed to be applied? Provide information about how offsets may be proposed to be applied.</td><td></td><td>An updated Project Area with altered footprint for the Thrumster WWTP and pipeline was provided by Council following the EIS Submission (see Appendix C-2, Appendix 2 – Figure 1). The updated Project Area reduces the amount of KFH that will be directly and indirectly impacted by the proposed scheme, with new areas shown in Table 4.3. This includes a modification of the proposed compound/laydown area at the Thrumster WWTP site to predominantly avoid the mapped Coastal Wetlands along Partridge Creek. Adjustments in the pipeline alignment also now avoids some sections of Type 1 KFH (as mapped Coastal Wetlands) and Type 3 KFH along the RTEP, SRM and RWM to the east of the Airport adjacent to Boundary Street and the RTEP, SRM and RWM in two small areas north of the Port Macquarie Racecourse.
Table 4.3 Updated approximate direct and indirect impacts to KFH as a result of construction works
<table>
<tr><th>KFH Type</th><th>Approximate Direct Impact Area (m2)</th><th>Potential Indirect Impact Area (m2)</th></tr>
<tr><td>Type 1 KFH/Coastal Wetlands</td><td>13</td><td>4,535</td></tr>
<tr><td>Type 3 KFH</td><td>52</td><td>1,001</td></tr>
</table>
The remaining direct impacts to Type 1 and Type 3 KFH occur in a small pocket of KFH on the northern side of Port Macquarie Racecourse. As identified in the Technical Report 6 - Aquatic Ecology Assessment (H2O Consulting Group 2024), habitat in this area was highly degraded, ephemeral and unlikely to provide permanent habitat for aquatic species, with species observed predominantly being terrestrial weeds. In situ verification during surveys would have attributed this Type 1 KFH as Type 3 KFH without it being mapped as a Coastal Wetlands Area.</td></tr>
</table>

<table>
<tr><th>Key Issues</th><th>Comment</th><th></th><th>Response</th></tr>
<tr><td></td><td></td><td></td><td>Considering the lack of habitat value this area provides and the lack of freshwater vegetation present, offsets for impacts to this area of Type 1 KFH are not required. As native freshwater vegetation is not present and thus not expected to be removed as part of the proposal in either of the above identified KFH areas where direct impacts will occur, no offsets for impacts to KFH are considered to be required or are proposed as part of this proposal.</td></tr>
<tr><td>Water quality and hydrology</td><td>Provide an estimate of the volume of tidal water that passes the hydraulic gradient change at the Gordon Street Bridge in a typical tidal cycle, compared to the volume of additional treated effluent that would be disposed of to Kooloonbung Creek each day.</td><td></td><td>Additional modelling was performed by Intrawater using the previously prepared Water Quality Response Model (WQRM) with the full analysis included in Appendix C-1 (Intrawater). A typical tidal cycle was simulated over four weeks within March 2016 for the baseline and background (circa 2058) climate change simulation.
The results suggest:
– For the existing baseline (circa 2023/24) scenarios, an average peak flow of 2.6 m^3/s was predicted near the Gordon Street Bridge, varying between 0.5-2 m^3/s during neap tides and 3-6 m^3/s during spring tides.
– For the existing background (circa 2058) scenarios, an average peak flow of 4.3 m^3/s was predicted near the Gordon Street Bridge, varying between 1-4 m^3/s during neap tides and 5-9 m^3/s during spring tides.
Predicted changes due to the addition of the Thrumster WWTP releases vary within and across tidal cycles, the average additional flow at the bridge is predicted to be +0.103 and +0.105 m^3/s for the baseline and background scenarios with project respectively. This correlates with the ADWF release volume from the Thrumster WWTP of 9.2 ML/d (~0.106 m^3/s).
Predicted average tidal flow volume at Gordon Street bridge is included below for various scenarios:
<table>
<tr><th>Scenario</th><th>Average tidal flow volume (ML)</th></tr>
<tr><td>Baseline (circa 2023/24)</td><td>63.1</td></tr>
<tr><td>Baseline (circa 2023/24) with Thrumster releases</td><td>64.0 (+0.9 ML)</td></tr>
<tr><td>Background (circa 2058)</td><td>110.8</td></tr>
<tr><td>Background (circa 2058) with Thrumster releases</td><td>111.8 (+1.0 ML)</td></tr>
</table>
Refer to Appendix C-1 (Intrawater, 2024).</td></tr>
<tr><td></td><td>Provide an estimate of the increase in height of the water level in Kooloonbung Creek due to the additional effluent that would be disposed into the Creek.</td><td></td><td>Additional modelling was completed as discussed above. Predicted changes due to the addition of the Thrumster WWTP releases vary within and across tidal cycles, the average additional depth at the bridge from the proposed discharge is predicted to be approximately +0.005 m (5 mm) for both the baseline and background scenarios. Maximum increase in depth for the baseline and background scenarios is anticipated to be up to +0.05 m (50 mm) and +0.04 m (40 mm) respectively. The changes are negligible in the context of the 1 to 1.3 m tidal cycle fluctuation as shown in Figures 2.7 and 2.8 in Appendix C-1 (Intrawater, 2024).</td></tr>
</table>

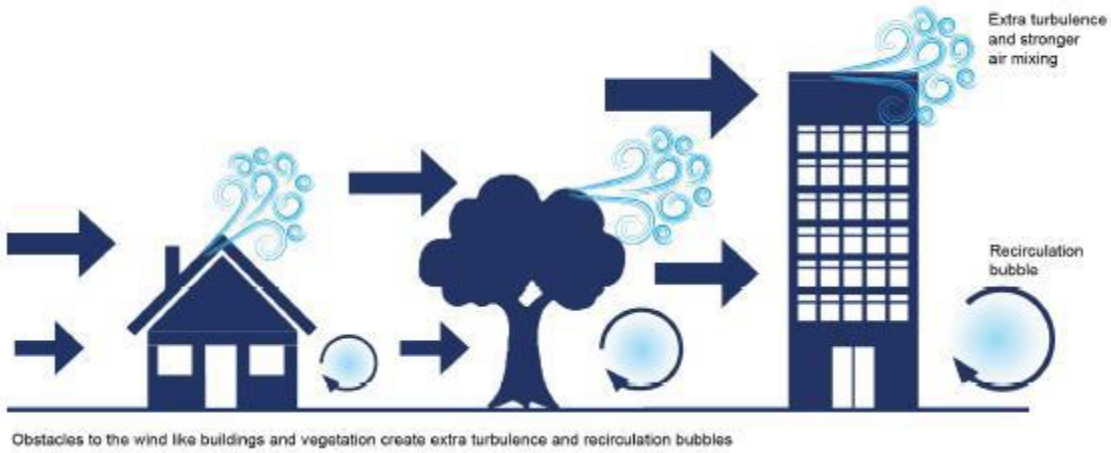
Key Issues	Comment		Response
	Provide details of final stormwater drainage arrangement for the WWTP and recycled water facility. It is not sufficient to defer this to be developed with a CEMP.		Finalisation of the stormwater drainage arrangement for the WWTP and the recycled water facility would be completed as part of detailed design. All site stormwater drainage (excluding from the inlet works hardstand) will be captured in zones on each of the pad levels either as overland flow dish drains or a pit and pipe network. The stormwater will be discharged to designated outlets around the perimeter of the pad. The use of separate zones will help reduce flow concentrations and the size of the required infrastructure to manage flows. Protection and localised dissipation structures will be installed at each of the outlet locations to provide erosion control. Each localised stormwater discharge around the pad perimeter will include stormwater quality improvement devices to improve the quality of stormwater prior to discharge. Stormwater drainage from the inlet works hardstand will be returned to the treatment plant for treatment.
	Provide the proposed operational hydrology monitoring locations, as the proposed locations are not clear.		The proposed operational monitoring locations include as per the Technical Report 1B – Operational Water Quality Impact Assessment: – An additional monitoring point within the WWTP site itself prior to transfer to Kooloonbung Creek, which would be confirmed during detailed design. (Refer section 6.2.1 of said report). – Council monitoring sites for Hastings River, Kooloonbung Creek are shown in Figure 4-1 of Technical Report 1B – Council monitoring sites for Fernbank Creek and Partridge Creek are shown in Figure 4-2 of Technical Report 1B – Council monitoring sites are also provided in Technical Report 1A Figure 3-15 – Continued monitoring of existing locations in the Hastings River, Partridge Creek, Fernbank Creek and Kooloonbung Creek. These are shown in Figure 3-15 of Technical Report 1A - Water Resources and Flooding Assessment. This would also include monitoring of existing points in Partridge and Fernbank Creeks during storm storage overflow events. (Refer section 6.2.2 of said report).
	Provide details of any Water Access Licenses that may be required for dewatering activities		As discussed in Section 7.4.1 of the Water Resources and Flooding Assessment, groundwater inflows may occur during construction of the pipelines within areas of open trenching within coastal sands and alluvium and groundwater inflows may occur, and within the Emergency Storage Pond at the WWTP site. Groundwater inflows into the Emergency Storage Pond were estimated in Appendix E of Technical Report 1A - Water Resources and Flooding Assessment. The best estimate of groundwater inflow rate into the Emergency Storage Pond is 0.29 cubic meters per day. Therefore, the annual groundwater inflow into the Emergency Storage Pond is anticipated to be approximately 106 cubic metres (0.106 megalitres). No WAL is anticipated on this basis.

Key Issues	Comment		Response
	Provide details of where creeks will be crossed and the proposed construction methodology. If trenching of creeks is proposed, justify why a less intrusive methodology was not chosen		The location and watercourse crossing construction style is shown in Figure 3.14 of Technical Report 1A - Water Resources and Flooding Assessment. This identifies the crossing methodology, with HDD proposed for crossings of the major waterways and selected minor waterways. Details of the geomorphologic changes of the mapped creeks within the study area have been included in Section 3.8. Further mitigation measures outlined in Section 7.3 identify the considerations of the design of each crossing to manage long-term risk following construction; as well as specifying site specific management plans to manage any short term risks during construction and to identify whether an adjustment in construction methodology is necessary based on observed conditions.
	Provide additional information relating to potential flooding to the south of the proposed site. This should include a level of information that is consistent with what has already been provided.		Under the 5% AEP flood the site (the location of the WWTP) is on a portion of the Hastings River floodplain that is not inundated by flood waters. However, access roads and floodplain areas to the south of the site are affected by backwater flooding from the Hastings River, with flood waters pushing back up into Partridge Creek and lower lying wetland areas of Fernbank to approximately 2.7 m AHD. At the site flood levels remain reasonably static with little hydraulic grade. The development contributes no impact to flood level south of the site in this event. In the 1% flood the location of the site would start being inundated to depths of around 0.5 m and areas south of the site would experience additional flood level to approximately 3.7-3.8 mAHD. At the site, flood levels remain reasonably static with little hydraulic grade, demonstrating slow flow velocities and the backwater flooding in this part of the floodplain. Depending on locations, backwater flooding to the south of the site could be to depths up to 2.5 m. The development contributes very minor and localised impact to flood level south of the site in this event. In the 0.5% and 0.2% flood, which is adopted as a proxy for future climate, flood depths in the floodplain at the site, south and north of the site increase by a further approximately 0.3 m to 0.4 m and 0.6 m to 0.7 m respectively, compared to the 1% AEP flood events. The development contributes very minor and localised impact to flood level south of the site in these events. Under the PMF/Extreme flood depths increase by approximately 3.3 m when considering the results from the Hastings River Flood Study (Patterson Britton & Partners Pty Ltd, 2006) and 4.3 m when considering the results of the Hibbard Precinct Flood Study (Advisian 2019), over the 1% AEP flood level. This would mean that flood depths at the site, north and south of the site were simulated to be around 3.8 and 4.8 m deep depending on which flood study result is adopted. The development contributes a minor reduction in flood level (up to -25 mm) south of the site in this event.

Key Issues	Comment		Response
Noise	*Justify why the noise logging locations were chosen. Section 3.1 of the Noise Technical Assessment identifies that noise logging locations are representative of worst-case scenarios, yet the locations in Figure 3.1 do not seem to represent appropriate noise monitoring locations.* *For example, why is location CT-04 located away from the proposed alignment as this does not represent a worst-case scenario for the closest residences?* *Table 3.2 and Figure 3.1 do not appear complete. Are there any noise sensitive receivers that have been identified along the alignment to the east of the airport.*		Noise monitoring locations were chosen as they are deemed to represent the existing background noise of the area. Selection considerations included location of sensitive receivers, land topography and contribution from other noise activities, such as road noise. Other considerations include access and security. Background levels tend not to vary significantly within a certain area and the measurement at specific locations can be considered representative for a surrounding area. The objectives of the monitoring were to measure the existing background noise levels in the areas surrounding the proposal to establish the noise criteria. Where the report refers to 'worst-case scenarios', this refers to the location within the catchment area that would be expected to have the lowest background noise levels. Note that this isn't always adjacent to the proposed alignment, as per CT-04. This would result in a lowest noise criteria being established, which would be considered the 'worst case scenario'. Monitoring at a location near the proposal may not be ideal as it may have noise sources in that area that would elevate the background noise level (e.g. arterial roads, industry, etc), resulting in a more lenient criteria for the noise catchment area. The nearest sensitive receivers to the project site were included in the assessment. The sensitive receivers used for operational modelling and assessment purposes are listed in Table 3.2 and shown in Figure 3.1. The worst-case operational noise contours provided in Technical Report 11 – Noise and Vibration Assessment shows that sensitive receptor locations do not extend to the east of the Airport.
	Justify why and how the boundaries of the noise catchment areas have been selected, as it appears that there are substantially different landuses within some catchment areas that are not consistent with the rest of the catchment.		Due to the large number of receivers surrounding the Proposal, noise catchment areas are used to group receivers. The noise catchment areas are established based on areas which receivers are expected to have similar existing noise levels. This process is outlined in the TfNSW Construction Noise and Vibration Guideline (CNVG). Although the land uses within a catchment area varies between catchment areas, the existing noise levels are expected to be similar throughout each catchment area. The different land uses are considered in the establishment of the criteria (as per Noise Policy for Industry (NPI) and Interim Construction Noise Guidelines (ICNG)). Only residential use is based on the existing noise levels, which are established for each noise catchment area. Other land use receivers (such as commercial, educational, industrial, etc) are based on a fixed noise limit, as outlined in the Noise and Vibration Assessment.
	Would there be any concurrent construction activities associated with the Cowarra project and how would those concurrent activities impact on noise levels.		The exact timing of both projects is subject to approval and detailed design process. As a result, the exact timing of any potential simultaneous construction activities is unknown at this stage. However, given the distance and the proposed staggered construction staging of both projects, cumulative construction impacts would be minimised as reasonably practicable. Furthermore, both noise reports provide all feasible and reasonable measures to minimise construction noise impacts. The suggested measures to mitigate construction noise are unlikely to change due to any overlapping construction activities.

Key Issues	Comment		Response
	Provide an updated report to address queries.		As per the previous comments above.
Land Use Conflict Risk Assessment	*A Land Use Conflict Risk Assessment (LUCRA) does not appear to have been provided. Appendix A (SEARs requirements) identifies that Chapter 18 includes a Land Use and Conflict Risk Assessment (LUCRA). Chapter 18 refers to Technical Report 13 – Land Use Property Impact Assessment (GHD 2024). Technical Report 13 is a Landscape Character and Visual Impact Assessment and specifically does not include SEARs requirements needed to address a LUCRA.*		A land use conflict risk assessment (LUCRA) has been prepared for the project and is presented in Chapter 18, Table 18-4 of the EIS. This LUCRA presents potential conflicts arising from the project and suggests mitigation measures to address these risks. The reference is incorrect in Table A.1 of the EIS.
	Please provide an appropriate LUCRA that addresses all requirements, including non-Council owned impacted Lots and DP. This should include plans at a sufficient scale to allow an understanding of the works proposed on, adjacent or under, each Council owned lot.		A table has been provided in Appendix C-7 outlining all affected properties. The identified properties are in line with properties affected by the detailed design of the project and may vary from the list provided in Section 3.1 of the EIS. The project is shown in Refer to Figure 3.1. Further detailed mapping showing surrounding land will be shown in the Project Amendment Report to be issued to DPHI following issue of the RtS.
	Clarify with tabled data all affected properties (including Lots already listed) to include Lot, address, zoning, land use, freehold status, and a brief description of the project's impact on it.		A table has been provided in Appendix C-7 outlining all affected properties. The identified properties are in line with properties affected by the detailed design of the project and may vary from the list provided in Section 3.1 of the EIS.

Key Issues	Comment		Response
Public Health and Safety Assessment	*The figures do not appear to be consistent or necessarily applicable. Figures 6.2 and 6.3 of Technical Report 12 are not specifically relevant to the type of work where dust generation is likely to be from the ground. (i.e. not a smokestack).*		During construction, the main potential for impact on air quality is the release of dust/particles into the air during earthworks. This is a common issue during most construction works (GHD 2024a). During operation of this facility, the main potential impact on air quality is the possibility of odours from the facility (GHD 2024a). The air quality assessment included: – Review of the existing environment (land use, ambient air quality and meteorology). – Review of the proposed construction methodology including equipment and processes. – Identification of construction activities which may lead to emissions. – Identification of nearby sensitive receptors to construction activities. – A qualitative air quality assessment with a focus on construction particulates and dust. – Review of operational activities and identification of sources of odour emissions. – Identification of project specific mitigation measures to manage the potential for dust and odour impacts (GHD 2024a). The assessment was undertaken in line with government guidance – in this case: – Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW EPA 2022). – Guidance on the assessment of dust from demolition and construction from the UK Institute of Air Quality Management (IAQM 2024). – Technical Framework for Assessment and management of odour from stationary sources in NSW (NSW DEC 2006a). Assessment criteria for dust/particles and for odour were taken from the Approved Methods Manual (NSW EPA 2022). Estimating odours or pollutants in off-site areas involves information such as: – Odour/pollutant concentration (or emission rate) at the facility. – Information about the meteorological conditions. – Information about the terrain in the surrounding areas. This information is used to estimate how the pollutants/odours are mixed and transported in the air and the concentration that may be present at ground level at different locations. Particles, pollutants and/or odours get into the air via point sources such as stacks or chimneys or via diffuse sources such as lift off from the ground or stockpiles when windspeed is sufficient. Air dispersion modelling can be used to estimate concentrations in air of particles, pollutants and/or odours due to either point sources or diffuse sources.

Key Issues	Comment		Response
			Once in the atmosphere the particles, pollutants and/or odours get mixed into and transported through the atmosphere due to the action of the wind and rain and the movement can be impacted by buildings or large vegetation. Figure 4.1 shows this mixing as particles, pollutants and/or odours move with the wind through the atmosphere once emitted or discharged. This is how particles, pollutants and/or odours move from a site where relevant activities are being undertaken to the local community around the relevant project site.  ***Figure 4.1 How wind moves particles, pollutants and/or odours through the atmosphere via wind and the turbulence generated by the interaction of wind and buildings or vegetation (NSW Chief Scientist 2018)***
	Confirm and detail the consultation that has been undertaken with the Food Standards Authority regarding the potential impacts of discharge of effluent to the Hastings River and the surrounding oyster leases.		Consultation regarding oyster leases was undertaken for the project as follows: – GHD issued an invitation to NSW Fisheries and NSW Food Authority in relation to this project – providing a description of what was proposed and seeking their input. – Both NSW Fisheries and NSW Food Authority staff were invited by Council to the planning focus meeting held at the beginning of this project. – In relation to NSW Food Authority staff, the particular staff that were invited and with whom consultation continued via Port Macquarie Hastings Council and others in the project team during the development of the EIS were Phil Baker and Anthony Zammit (Acting Manager and Manager NSW Shellfish Program).

Key Issues	Comment		Response
			– Ongoing consultation included discussion about the project, information about the water quality modelling, the options for the location of the discharge point for treated effluent, dye tracing study and concerns from oyster growers. – They noted that they are involved in ensuring appropriate controls are in place for oyster leases and for pipi collection – both of which are relevant for this project.
Social Impact Assessment	*Were Aboriginal groups consulted in terms of impacts to social values as part of the SIA? Particularly for matters outside the scope of the ACHA, such as connection to Country (including waterways) and cultural landscapes? (SIA guideline section 4.3)*		Consultation with Aboriginal groups was undertaken for the Project through the preparation of the ACHA (Section 3 of the ACHA) and through the broader EIS stakeholder consultation (Section 5.2). Section 4.3.3 of the SIA outlines the findings of information provided from the ACHA consultation process with Aboriginal groups, including summarising information outside of the ACHA scope regarding the cultural value of waterways, water and the overall landscape. Potential impacts from the project on Aboriginal cultural heritage and values is further assessed in Section 5.1.1.4 of the SIA, which draws on consultation outcomes from Aboriginal groups undertaken by the ACHA.
	Were Aboriginal groups north of the Hastings River consulted?		Consultation with Aboriginal groups was undertaken for the Project through the preparation of the ACHA (Section 3 of the ACHA) and through the broader EIS stakeholder consultation (Section 5.2). Aboriginal groups north of the Hastings River were not specifically consulted with, however opportunity was provided for Aboriginal people who may be interested in the project to come forward at the beginning of the ACHA process. In accordance with Section 4.1.3 of the Consultation Requirements (DECCW 2010a), a newspaper advertisement was placed in the Port Macquarie News newspaper on September 1, 2023. The advertisement included a close date of 5 pm on 15 September 2023 to provide additional opportunities for Aboriginal people who may be interested in the Project to come forward. At the time of assessment, there were not any Native Title claimants. The consultation process was undertaken in accordance with the guidelines.
	Please provide further detail on the Stakeholder groups consulted (section 3.2) including: *How these groups represent a broad cross section of the community in a manner consistent with the SIA principles identified in table 3 of Appendix A to the SIA guideline* *How this engagement canvassed all relevant views, including those of vulnerable or marginalised groups* *Any data limitations or assumptions made*		As detailed in Section 5 of the EIS and Section 3.1 of the SIA, Council has conducted a comprehensive engagement program with stakeholders, landholders and communities throughout the project planning and approval process. As per Appendix A, Table 3, of the SIA Guideline, consultation for the SIA was undertaken in the 'consulting to collect information and insights' category. As detailed in Section 3 of the SIA, five (5) interviews were undertaken by the SIA team across several stakeholder groups including community organisations, industry groups, Council representatives and advocacy groups. The SIA has drawn on stakeholder outcomes from a broad range of stakeholder groups, including consultation outcomes from both broader EIS engagement and outcomes from targeted SIA engagement. Through both broader EIS engagement and targeted SIA engagement, the SIA has considered a broad cross section of the community, with outcomes utilised for establishing the baseline context, impact identification and assessment and in the development of management measures.

Key Issues	Comment		Response
	Section 5.1.2.1 – please provide further detail on duration of social impacts or constructing the pipeline, including duration of impacts		It is anticipated that construction of the project would occur over an approximately three year period, with completion dates of each component expected to include: – Year 1 – Mobilisation and site establishment including laydown areas. – Year 2 – Civil works. – Year 3 – WWTP and RWTP construction and pipeline installation including set out under boring locations and laydown areas, Testing and commissioning and site demobilisation and surface rehabilitation. Within each stage there will be some flexibility around timing and sequencing however this will be dependent upon successful contractor and availability of materials and equipment. Other project components, including the Recycled water main (RWM), secondary TWWTP power supply, or some sewer rising mains (SRM) will be delivered progressively from the date of commissioning of the WWTP.
	Table 5.2 notes key features along the pipeline including potentially vulnerable groups (i.e. elderly people) – please provide further detail on how the SIA has considered how impacts will be experienced and any specific mitigation measures.		The SIA considers how some groups may be vulnerable to particular impacts during construction and operation of the project. Section 5.1.2.3 details construction related amenity impacts, which can often disproportionately impact vulnerable residents including people with a disability, the elderly, people with underlying medical conditions and families with young children. Table 6.1 of the SIA recommends that Council will continue to consult with the community until completion of the project. This will include approaches to consult with landowners, landholders, emergency services, schools, aged care facilities, businesses, community groups and community and recreation facilities in close proximity to the project, and in line with key features in Table 5.2. It is also detailed in table 6.1, specific management measure relating to ongoing identification, engagement and consultation with vulnerable persons that might be affected by the proposal.
	Provide further clarification of the social benefit from changes to sewage treatment and non-potable water supply access, how it would be experienced and identify those groups who would experience it.		Port Macquarie is one of the fastest growing regional cities in NSW with an additional 9,100 new homes required to meet the anticipated growth projections outlined in the North Coast Regional Plan 2041. The population is expected to 115,302 residents by 2046 (PMHC 2024), increasing demand on existing infrastructure and utilities. The proposed Thrumster Wastewater Scheme project aims to service the predicted population growth. The project is required to provide a secure and reliable wastewater scheme to service residential growth across the Thrumster, Sancrox and Fernbank Creek areas of the LGA. The wastewater scheme is considered an essential service to allow for the projected growth in the region to continue. A recycled water plant incorporating UV and chlorine disinfection systems is included in design to provide treatment for up to 4.7 ML/day for non-potable reuse.

Key Issues	Comment		Response
	Considering the likely duration and timing of construction for different components of the project, clarify the level of potential flexibility of construction timing, sequencing, footprint and approach for each component.		It is anticipated that construction of the project would occur over an approximately three year period, with completion dates of each component expected to include: – Year 1 – Mobilisation and site establishment including laydown areas. – Year 2 – Civil works. – Year 3 – WWTP and RWTP construction and pipeline installation including set out under boring locations and laydown areas, Testing and commissioning and site demobilisation and surface rehabilitation. Within each stage there will be some flexibility around timing and sequencing however this will be dependent upon successful contractor and availability of materials and equipment. Other project components, including the Recycled water main (RWM), secondary TWWTP power supply, or some sewer rising mains (SRM) will be delivered progressively from the date of commissioning of the WWTP.
	Consider if specific actions should and could be taken to avoid/reduce/manage construction noise, vibration, access and safety impacts, particularly for the identified sensitive social infrastructure (schools and aged care).		As the project goes through detailed design, the duration and extent of impacts to sensitive social infrastructure that is located in close proximity to construction areas would be further understood. In accordance with SE4 these providers will continue to be consulted throughout the detailed design process to share information about the potential impacts to these facilities during construction and identify and implement appropriate measures to minimise potential impacts to the services and their users as far as possible. Other relevant mitigation measures would also be implemented (as detailed in the EIS) to address potential impacts such as: – Additional measures to address construction noise which exceeds construction noise objectives (NV21). – A property management plan to address landowner concerns and minimise disruptions (LP7). It is considered that the recommended mitigation measures are appropriate to minimise and manage impacts to sensitive social infrastructure in close proximity to construction areas.
Ecologically Sustainable Development	*Provide the environmental mass balance for the project and life-cycle strategies, developed in consultation with the NSW Environment Protection Authority (EPA) (refer Secretary's Environmental Assessment Requirements (SEARs) Key Issue 23).*		The EPA required: *a) the environmental "mass balance" for the process – quantify in-flow and out-flow of materials, any points of discharge to the environment and their respective destinations (sewer, stormwater, atmosphere, recycling, landfill etc).* The WWTP has been designed to treat a portion of wastewater currently directed to Port Macquarie WWTP and new connections from the Thrumster, Sancrox and Fernbank Creek area. The WWTP would have a design capacity of 40,000 EP and design flow of 9.2 ML/day by 2039. Chapter 16 of the EIS outlines how in-flows and out-flows would be managed during construction and operation. Chemicals would be managed in accordance with Managing Risks of Hazardous Chemicals in the Workplace 2022 (SafeWork NSW 2023).

Key Issues	Comment		Response
			All wastes would also be managed in accordance with the waste provisions contained within the POEO Act and other relevant legislative and policy requirements, as defined by the instruments, policies and guidelines. Should waste be found to be unsuitable for reuse or recycling, disposal methods would be selected based on the classification of the waste material in accordance with the Waste Classification Guidelines (NSW EPA 2014a). The Waste Classification Guidelines provide direction on the classification of waste, specifying requirements for management, transportation and disposal of each waste category. The management and mitigation measures that would be implemented to minimise impacts associated with waste and chemicals of the project are identified in Section 16.5 of the project EIS.
Soils and Contamination	*The development area includes works within mapped acid sulphate soils. Provide details of proposed treatments and methods of disposal.*		An Acid Sulfate Soil Management Plan (ASSMP) will be prepared as part of the CEMP for this project. The ASSMP will outline ASS management procedures and will inform the handling and treatment of ASS disturbed during construction works for the Project. An outline of the purpose, ownership, proposed disturbance activities, management approach and requirements of the ASSMP have been developed for the project and are outlined in Appendix C-4, Supporting Information. A list of general requirements for the ASSMP are listed below: – Provide a specification of the neutralising agents to be used in addition to liming rates to be adopted for soil neutralisation. – Outline how soil stockpiles will be managed including, but not limited to, identification of an ASS treatment area, appropriate controls to prevent acidic runoff and seepage and runoff/seepage water management. – Development of a monitoring program to verify that the proposed mitigation strategies are effective in minimising negative environmental impacts due to acid generation, which will include performance criteria for treated soil validation and any acidified water generated requiring treatment. – A contingency plan that will be implemented, if the procedures outlined in the ASSMP fail to adequately treat stockpiled ASS, control discharge of ASS from the Project area and/or protect receiving environments from low pH/dissolved metals. The contingency plan will include both remedial and restoration actions. – Outline occupational and environmental risk management procedures. – Detail reporting requirements.

Key Issues	Comment		Response
	Provide an up-to-date projection of coastal erosion and recession. The studies that have been referenced are not up to date and should include the NSW Coastal Management Manual 2018 and the latest IPCC projections.		Port Macquarie-Hastings Council is in the process of preparing a Coastal Management Program (CMP) in accordance with the five stages outlined in the NSW Coastal Management Manual. Council completed a Stage 1 scoping study in 2021 and anticipates that the remaining stages of the CMP will be finalised from 2024. Given that the CMP is not yet available, the assessment relied on the available literature to define the coastal processes and hazards related to the project area. The CMP is expected to update and improve upon the earlier studies relating to coastal erosion and recession. As a result, some coastal areas within the Port Macquarie-Hastings LGA could be considered more or less vulnerable to coastal hazards than indicated by the earlier studies. In the case of the project area, it is important to note that all project infrastructure is located in excess of 2.5 kilometres west of the open coast. The proposed Wastewater Treatment Plant itself is located approximately 6.5 kilometres west of Town Beach. Previous coastal hazard assessments, estimated the long term (2100 scenario) beach recession associated with sea level rise to be approximately 22 metres at Town Beach and approximately 61 metres at Lake Cathie Beach. Although the updated CMP studies are not yet available, it is extremely unlikely that the updated projections of coastal erosion and recession would increase to the extent that they would interact with the project area. In fact, the airport and majority of the Town of Port Macquarie would be lost to coastal erosion before coastal erosion impacted the proposed Wastewater Treatment Plant. Aside from the costs and timeframes required to deliver a detailed project-specific hazard assessment, there would be a number of risks associated with developing a separate coastal risk and vulnerability assessment in parallel to that being developed under Council's CMP. As a result, the coastal erosion risk assessment outlined in the EIS is considered appropriate given the low level of coastal erosion risk within the project area.
	Please include updated details of erosion and sediment control measures that are applicable to soils and contamination.		Erosion and sedimentation controls have been presented in Technical Report 1A – Water Resources and Flooding Assessment and identify that a soil and water management plan, and site-specific erosion and sedimentation control plans are to be prepared. Details of the erosion and sediment control measures can be found in Section 8.1 of this document.
Traffic and Transport	*Identify how construction traffic will be managed along Fernbank Creek Road and at the intersection of Fernbank Creek Road and Hastings River Drive. Are temporary signals proposed?*		As detailed in Section 4.7 of the Technical Report 7 – Traffic and Transport Assessment there is insufficient space for a 26 metre B-double truck to undertake a right turn from Fernbank Creek Road onto Hastings River Drive, while staying within the westbound lane on Hastings River Drive. Measures to support the management of construction traffic at the Hastings River Drive/Fernbank Creek Road include: – A construction zone speed reduction to 40 km/h on both sides of Hastings River Drive in proximity to Fernbank Creek Road. – The use of signage, i.e. trucks turning. – The use of traffic control on Hastings River Drive to support the turning manoeuvres of heavy vehicles.

Key Issues	Comment		Response
			Prior to commencement of construction activities, the contractor will be required to prepare a Construction Traffic Management Plan (CTMP) to assess impacts on the road network and identify appropriate mitigation measures. The CTMP will include Traffic Guidance Schemes (TGS), which will include an arrangement of temporary traffic control devices to warn traffic and guide it around, through or past a worksite or temporary hazard. The TGS will detail the location of the work and the proposed Traffic Management to maintain safe movement of pedestrian and vehicular traffic through and around a worksite. The TGS, including the required signage will be developed in accordance with the TfNSW Traffic Control at Work Sites guidelines.
	Is there sufficient space on the road to accommodate two-way heavy vehicle construction traffic along Fernbank Creek Road? Is a road upgrade potentially required?		Swept path analysis indicates that there is sufficient space for heavy vehicles to pass each other on Fernbank Creek Road. This road contains existing culvert and guard rail, where the road is about 5 m width. If required, northbound trucks could pull over to the left to enable southbound vehicles to traverse the culvert and continue onto the construction compound. Accordingly, bi-directional traffic volumes on Fernbank Creek Road can be supported. The proposed access road track to the construction compound/WTP site has been designed to support bi-directional traffic volumes.
	Is there sufficient space to allow pedestrian movements along Fernbank Creek Road?		There are currently no pedestrian facilities on Fernbank Creek Road. In accordance with the distance of the construction compound/WTP site from Port Macquarie (a minimum of three kilometres) and the absence of active transport facilities on the roads leading to the construction compound/WTP site it is not expected that there will be any pedestrian activity on Fernbank Creek Road.
	Where will engineering fill be sourced from and will there be any traffic impacts at source or along route as a result of the importing of fill?		Engineering fill will be sourced from other Council projects, including the Cowarra Water Treatment Plant and local quarries as required for the balance of fill not sourced elsewhere. The volume of heavy vehicle numbers has been allowed for in the traffic projections.
Air Quality	*Confirm if the intake will be covered or uncovered, and what implications covered/uncovered may have for odour dispersion.*		The design and space provision for covering the inlet will be allocated. However, the installation of the cover would be dependent on further detailed design process and assessment.
	Confirm if an Odour Control Unit is to be installed and the reasons for this decision.		Provision for an odour control unit (OCU) has been included in the detailed design of the WWTP. The OCU would be installed, if deemed required based upon monitoring of the performance of the WWTP.

Key Issues	Comment		Response
	In the event of discharge of minimally treated effluent from the storage pond during high rainfall events, what are the likely odour impacts during discharge and in the period after discharge has ceased?		During wet weather events, the wastewater is highly diluted. Any increased odour would be short term. Diluted effluent would not be discharged from the storm storage pond until it reaches capacity, approximately 25ML. The stormwater pond is sized for events when population reaches to 80,000EP (plus stormwater event). Therefore, it is unlikely for Stage 1 (40,000EP) to overflow diluted effluent until there is high stormwater event. Flows diverted to the storm storage pond would be screened, reducing the volume of solids a key odour source. Additionally, given the large storage volume, remaining solids would settle in the storm storage pond. In an event like this, the effluent would be highly diluted. After the stormwater event, the stored volume in storm storage pond would be returned to the treatment plant for full treatment. The final design will include provision of the OCU which will provide additional mitigation of odour emissions if deemed required based upon ongoing monitoring of the performance of the WWTP.
	Confirm how the management of solid, liquid and gaseous waste streams with potential to generate emissions to air will be undertaken.		The wastewater treatment plant is highly automated and controlled. Solid waste would be transferred from the sludge loading facility which has been included in the dispersion model. Gaseous waste streams from the inlet works and sludge dewatering would be extracted to the odour control unit. Liquid waste would be treated by the facility and sources of odour during treatment have been included in the dispersion model.
	Provide an estimate of the resulting ground level concentrations of all pollutants. Where necessary use an appropriate dispersion model to estimate ambient pollutant concentrations.		The air quality assessment has assumed odour is a complex mixture of pollutants and therefore we have undertaken the assessment in accordance with the NSW EPA Approved Methods guidelines for odour impact assessments which refer to the *Technical framework: assessment and management of odour from stationary sources in NSW.* Sources of odour in a WWTP generally include H_2S, ammonia and VOCs. It is common practice in NSW to assess odour from WWTPs using the cumulative odour criteria rather than assessing individual odorous pollutants.
	Outline specifications of pollution control equipment and management protocols for point and fugitive emissions.		An OCU will be included in the final design which will provide additional mitigation of odour emissions if deemed required based upon ongoing monitoring of the performance of the WWTP. It has been assumed the OCU will meet an emission concentration of 500 OU.

Key Issues	Comment		Response
Waste	*The EIS outlines existing waste sources in the Port Macquarie-Hastings LGA, but none that are specifically related to the project. The existing WCA does not mention any existing operations related to proposal or any approved regional or industry waste plans. Please provide updated information as per the SEARs.*		Chapter 16 of the EIS (GHD, 2024) identifies plans, policies and guidelines for waste management that are relevant to the project including the Port Macquarie-Hastings Council Development Control Plan 2013 (including Developments, Public Place & Events - Waste Minimisation and Management Policy (PMHC, 2020)), NSW Waste and Sustainable Materials Strategy 2041 Stage 1: 2021-2027 (DPIE, 2021) and NSW Circular Economy Policy Statement: Too Good to Waste (NSW EPA, 2019). In addition, the North Coast Regional Plan 2041 developed in 2022 by NSW Department of Planning, Housing and Industry (formerly NSW Department of Planning and Environment) sets out a 20 year strategic land use planning framework for the region. The project supports Objective 6 of the plan to create a circular economy. The project includes strategic waste planning and waste management strategies which support a circular economy. Recyclable waste streams generated during construction and operation would be separated for resource recovery. The Waste and Resource Recovery Strategy 2024-2034 prepared by Port Macquarie-Hastings Council outlines the strategic direction for the LGA to align with the NSW Waste Strategy (DPIE 2021) and its targets. The project is consistent with the following strategic objectives: – Reduce generation of waste (through design and procurement optimisation). – Increase diversion of waste from landfill (through segregation of recyclable materials for reuse on site or off site resource recovery).
Services	*Please provide details of the services that are to be relocated as part of the proposal, and the details of any landscaping that will be provided. It is not appropriate to defer information to CEMPs*		The detailed design planning stage is currently underway. Through this process, Council aims to avoid existing services and not relocate them. Regarding landscaping, site levelling around the pump stations would be undertaken as part of the construction and post construction works. Restoration along the pipeline corridors would be restored to existing conditions.

4.3 New South Wales Rural Fire Service

Comment

The NSW RFS made the following comment, dated 20 August 2024:

– *The EIS documentation includes a 'Bushfire Assessment' prepared by GHD dated 3 July 2024. The bushfire protection measures/strategies nominated within the report should be included in any approval issued.*

– *In addition, the following requirements are also recommended to be included in any approval issued:*

  1. To allow for emergency service personnel to undertake property protection activities, a 10 metre wide trafficable defendable space (APZ) that permits unobstructed vehicle access is to be provided around the perimeter of development footprint. The trafficable surface shall be a minimum 4 metres wide and provide all weather access.
  2. *All habitable structures shall comply with Section 3 and Section 5 (BAL 12.5) Australian Standard AS3959-2018 'Construction of buildings in bushfire-prone areas'.*

Response

1. The proposed APZ for the WWTP is 20 metre width. This is measured from the nearest part of the built structures to the nearest point of grassland hazard to each structure. This is not proposed to be from the fence/development footprint.
   a. The trafficable surface permits unobstructed vehicle access around the perimeter of the development footprint and complies with the 4m wide all-weather requirement.
   b. The existing condition meets the intent of the RFS recommended condition that there would be a 20 m wide APZ and trafficable bitumen surface for all weather access. However, this component of the APZ would be within the fence.
2. There are no habitable structures as part of the project. The only on-site occupiable building providing potential working area is limited to the Amenities building which is located internally within the site more than 100 metres from the nearest forest vegetation (to the south), and more than 30 metres from the nearest grassland (to the west). The BAL at the Amenities area will be BAL 12.5 even without establishing any APZ.

4.4 NSW DCCEEW BCS and NPWS

Comment

BCS made the following comments, dated 2 September 2024:

Biodiversity

– *The project has the potential to cause a Serious and Irreversible Impact (SAII) on Giant Dragonfly and BCS recommends the proponent make further effort to avoid and minimise the impacts. We note that this issue has a simple resolution documented in Attachments B and C.*

– *The subject land assessed in the Biodiversity Development Assessment Report (BDAR) does not cover the full extent of the development footprint.*

– *The proponent needs to revise the Plant Community Type (PCT) mapping to ensure it is consistent with the requirements of the Biodiversity Assessment Method 2020 (BAM).*

– *The project includes development within a BioBanking site which may not be permissible.*

– *The proponent needs to prepare a species polygon for Melaleuca biconvexa.*

– *The proponent needs to provide further details of the adaptive management plan for prescribed impacts to biodiversity values within Kooloonbung Creek.*

Water

- *The EIS does not clearly demonstrate how the project will contribute to achieving Water Quality Objectives over time where they are currently not being achieved.*
- *Coastal processes and associated hazards.*
- *The EIS does not assess and describe the potential impacts of the coastal hazard 'tidal inundation', including the impacts of projected climate change-induced sea level rise on increased tidal inundation hazard risk to the subject land or other land into the future.*

NPWS

- *The EIS needs to recognise lands reserved or acquired under the National Parks and Wildlife Act 1974 (NPW Act) in the project area.*
- *The proponent needs to consider and appropriately manage the construction impacts on NPWS-managed lands.*
- *The proposal creates operational risks which need to be identified and addressed, including through assessing of the likelihood of asset failure and identifying emergency measures to prevent or minimise impacts to the upper reaches of Kooloonbung Creek in Lake Innes Nature Reserve.*

Response

Responses are provided in Table 4.4 and Table 4.5. Further information is provided in Appendix C-6 and Appendix C-2 (terrestrial and aquatic ecology technical letters).

Table 4.4 Key DCCEEW Assessment

Issue	BCS recommended action	Extent and timing	Response
Biodiversity	The proponent refines the project design to further avoid and minimise impacts to the high condition wetland areas. The assessor amends the BDAR to document all measures the proponent has taken to avoid and minimise impacts in accordance with Section 7.1 and 7.2 of BAM. The accredited assessor revises the SAII assessment for Giant Dragonfly to: Describe any further efforts by the proponent to avoid and minimise impacts. Provide an accurate description of the potential impacts to the species habitat.	Extent: Increased avoidance of wetland habitat is likely to result in reduced biodiversity impacts (including to SAII entities) and offset requirements. Timing: Pre-determination	The proposed TWWS Project Area has been amended to minimise the area of the proposed compound/laydown area at the Thrumster WWTP site to reduce impacts to the Type 1 KFH associated with the Partridge Creek Wetlands (see Appendix C-2, Appendix 2 – Figure 1), which contains potential Giant Dragonfly habitat. Indirect impacts are expected to occur to approximately 137 m^2 of the southern edge of the Partridge Creek wetlands. Following review of the BDAR, BCS raised concern that the project could cause a SAII for Giant Dragonfly. The BDAR had addressed Sections 7.1 and 7.2 of the BAM by reassessing the need to use the Partridge Creek Site and completely revising the method of wastewater treatment from using a treatment wetland to discharging at Kooloonbung Creek. BCS recommended that the project area required for site compounds and laydown areas be reduced to prevent further impacts on potential Giant Dragonfly habitat. The extent that Giant Dragonfly habitat could be further avoided (Figure 1) has been maximised. The avoidance has reduced direct impacts on 1.04 ha of PCT 3967, with avoidance taken for the full extent of the vegetation zone where possible. Refer to Figure 1 in Appendix C-6 which shows the previous design and current design and the changes in Giant Dragonfly impact by the project.

Issue	BCS recommended action	Extent and timing	Response
[redacted]	The assessor revises the BDAR to include all areas of the project footprint (excluding Biodiversity Certified land) within the subject land.	Extent: Changes to the extent of the subject land are likely to influence the offset requirements. Timing: Pre-determination	BCS identified that the BDAR did not fully explain the proposed works within Fernhill Road, Acacia Avenue, and missed slivers of land within the Biodiversity Certification area that were not Biodiversity Certified or under the BioBanking Agreement. Though some areas received minimal description as there were no biodiversity impacts, we thank the department for detecting areas that were missed during our assessment, particularly slivers within the Biodiversity Certification area that were not under Biocertification. An amended BDAR has been developed that fully describes these areas and has investigated areas that were missed during the previous assessment. This amended BDAR will be appended to the project Amendment Report which will be issued to the DPHI separately.
	The assessor revises the vegetation mapping to ensure all native vegetation is mapped to the most likely PCT and that vegetation zones represent areas in the same broad condition state.	Extent: Changes to the PCT mapping and vegetation zones are likely to influence the offset requirements. Timing: Pre-determination	Areas that were assessed as being exotic vegetation were determined based on findings from BAM Plots and interpretation of vegetation stratification by BAM Accredited Assessors. In some areas there may have been differences in GPS accuracy for interpretation of the location of the study area, particularly in narrow linear areas of the project. de Witt Ecology has reviewed the suggested areas that could be considered native and have agreed to include them as native vegetation within relevant vegetation zones. An amended BDAR will be appended to the project Amendment Report which will be issued to the DPHI separately.
	The EIS be revised to either: – Propose a redesigned project that avoids direct impacts within any BioBanking Site. or – Demonstrate that the proposed works within the BioBanking Site are permissible under the BioBanking Agreement.	Extent: Changes to the alignment would likely involve revised assessments in the EIS. Timing: Pre-determination	Works were initially proposed to occur within an existing access tracks within the BioBanking site as this would reduce impacts to native vegetation. However, following further advice the project has been revised such that it remains completely within the Biocertified lands when in proximity to the Port Macquarie Airport. See Figure 2 (in Appendix C-6) for an outline of the revised footprint.

Issue	BCS recommended action	Extent and timing	Response
	The accredited assessor revises the BDAR to include a species polygon for Melaleuca biconvexa.	Extent: Adding the species polygon would result in Melaleuca biconvexa species credits being generated. Timing: Pre-determination	A species polygon for *Melaleuca biconvexa* was not prepared, as the recorded individual is not directly impacted by the proposal. Additionally, the surrounding area is under long-term management, which prevents the species from establishing within the project footprint. The presence of exotic vegetation around the recorded individual also facilitated a highly reliable survey of the footprint, further confirming its limited occurrence within the impact area. However, a species polygon has been developed for this species. This will be submitted with an amended BDAR.
	The accredited assessor revises the BDAR to include further details of the adaptive management plan for uncertain impacts associated with the proposal.	Timing: Pre-determination	Due to the uncertainties associated with the projects influence on Kooloonbung Creek, BCS requested that further details be provided within the adaptive management plan for the area. As part of an amended BDAR, greater clarity will be provided for the adaptive management plan in relation to hydrological changes, in particular considering Section 8.5 (4-5) of the BAM. The amended BDAR will provide a variety of options to mitigate any indirect or prescribed impacts caused by hydrological changes in Kooloonbung Creek.
Water	The EIS be revised to assess and describe strategies required to improve the health of Kooloonbung Creek receiving waters given all water quality indicators are well above the guidelines.	Timing: Pre-determination	Council administers the Coastal Management Plan which includes the Hastings River Estuary. The management plan set sets out a strategy for managing waters and estuaries, with the aim to improve the health of all Coastal assets. As part of the modernisation of Council's existing wastewater infrastructure, the proposed wastewater system provides increase quality of treatment compared to existing infrastructure. However, as population grows in the catchment, future mass loads increase and contributes to water quality indicators being above guidelines. Detailed discussions regarding Water Quality Objectives are included in Section 4.16. In addition to the Coastal Management Plan, the proposal includes continued water quality monitoring to understand changes to Kooloonbung Creek, which could be used to support future development of the Coastal Management Plan and strategies for Kooloonbung Creek.
Coastal processes and associated hazards	Revise the EIS, and all relevant technical inputs, to:	Timing: Pre-determination	Water resource assessment, including flood modelling undertaken as described in Section 3.6 of Technical Report 1A – Water Resources and Flooding Assessment

Issue	BCS recommended action	Extent and timing	Response
	– Describe and assess tidal inundation risk in the study area for current day and over the future 100-year planning horizon. – Describe actions to avoid causing increased risk of coastal hazards on that land or other land.		including consideration of tidal inundation over the project design life with adoption of sea-level-rise estimates and setting of appropriate freeboards. The site has been located in accordance with applicable guidelines as described in the water resource and flooding report. No impacts are expected to occur in relation to hazards associated with the open coast given that all project infrastructure is located in excess of 2.5 kilometres west of the open coast and the proposed Wastewater Treatment Plant itself is located approximately 6.5 kilometres west of Town Beach. No actions or mitigation measures are required to avoid causing increased risk of coastal hazards associated with the open coast on this basis.

Table 4.5 Key NPWS Assessment Issues

Issue	NPWS recommended action	Extent and timing	Responses
NPWS	Revising the EIS, and all relevant technical inputs to ensure: – Using the NPWS-managed lands layer available on SEED which shows lands reserved under the NPW Act or vested under Part 11 of the NPW Act, the proponent identifies all land reserved or vested under the NPW Act particularly the sections of the proposed Treated Effluent Pipeline alignment adjoining the NPWS estate. – All figures and maps are appropriately scaled to show tenure, the Treated Effluent Pipeline alignment (including any temporary construction easements and site compounds) and any NPWS (and service provider) assets in proximity to the scheme. – All potential impacts identified in the guide Developments adjacent to National Parks and Wildlife Service lands: guidelines for consent and planning authorities (DPIE NPWS 2020) are considered in relation to the Treated Effluent Pipeline construction and operations.	Timing: Pre-determination	A search of the NSW National Parks and Wildlife Service (NPWS) Estate indicated that the project is not located within any lands reserved or acquired under the National Parks and Wildlife Act. The project is approximately 2.2 km from the Innes Ruins Historic Site Trenching will occur approximately 22 m away from the boundary of the Lake Innes Nature Reserve, separated by Lake Road. Discharge from the project will occur approximately 620 m downstream along Kooloonbung Creek from the Lake Innes Nature Reserve. There are no proposed direct impacts to NPWS land as part of the project. Indirect impacts to be managed in accordance with mitigation measures – refer to Appendix B.

Issue	NPWS recommended action	Extent and timing	Responses
Minimising construction impacts on NPWS managed lands	Impose conditions of consent that require the Construction Environmental Management Plan to: – Include an Erosion and Sediment Control Plan (ESCP) for the Treated Effluent Pipeline installation that explicitly outlines measures aimed at preventing impacts on the adjacent parts of Lake Innes Nature Reserve consistent with the 'Blue Book', specifically Managing Urban Stormwater: Soils and construction - Volume 2A Installation of services (DECC 2008) and Managing Urban Stormwater: Soils and construction - Volume 1 (Landcom 2004) – Identify NPWS as a stakeholder to be notified of any incidents likely to result in impacts to Lake Innes Nature Reserve.	Timing: Pre-construction, as a condition of determination	Comment noted. Condition of consent relating to ESCP and NPWS to be included in project approval.
Hydrologic impacts on NPWS managed lands	Revising the EIS to identify and detail: – Potential upstream impacts to Kooloonbung Creek, with reference to the impacts on key fish habitat and land mapped as Coastal Wetlands under the State Environmental Planning Policy (Resilience and Hazards) 2021.	Timing: Pre-determination	Water quality modelling as described in Technical Report 1B – Operational Water Quality Impact Assessment, identified water quality changes up to 3.4 km upstream of Kooloonbung Creek from the river mouth, extending upstream of the discharge location. The results are generally similar to the baseline/background scenarios, with minor increases in total nitrogen and inorganic nitrogen concentration. These increases are anticipated to extend upstream of the discharge location, returning to background baseline/background conditions within approximately 750 m of the discharge location. Further details are provided in Appendix C-2 in regard to assessment the potential upstream impacts with reference to the impacts on KFH and wetlands.
	Operational risks of the scheme, and specifically the Treated Effluent Pipeline. This should consider the likelihood of asset failure and how this will potentially affect Kooloonbung Creek and Lake Innes Nature Reserve, and set out emergency intervention measures.		Operational risks of the proposed WWTP are to be considered in an operational management plan. As part of the modernisation of Council's wastewater network, the risk of asset failure is greatly reduced. Should asset failure occur in the treated effluent pipeline, release rates and mass loading would not change in Kooloonbung as discharge rates are governed by the treatment plant at Thrumster and not the pipe network. Should any asset failure occur, treated effluent could be temporarily stored in the proposed storm pond until such time that the asset is restored. Refer to Appendix C-1 (hydrodynamic analysis) and Appendix C-2 (Aquatic ecology) for detailed responses to this submission regarding operational risk.

Issue	NPWS recommended action	Extent and timing	Responses
	– The cumulative impacts of the proposal, as this project will significantly increase the amount of treated effluent already discharged into the creek.		Cumulative impacts have been considered during water quality impact modelling, with the modelling undertaken considering the baseline/background scenarios (including the existing effluent being discharged into the creek) against the additional load arising from the proposed development. Section 4 and 5 of Technical Report 1B – Operational Water Quality Impact Assessment, details the inclusion of the existing WWTP releases as well as other potential cumulative impacts associated with catchment runoff, future land use change and climate change. Refer to Appendix C-2 (Aquatic ecology) for detailed response to this submission regarding cumulative impacts.

4.5 FRNSW

Comment

FRNSW provided the following comments on 9 August 2024:

FRNSW submit no comments or recommendations for consideration, nor any requirements beyond that specified by applicable legislation.

While there is currently no requirement for a Fire Safety Study, FRNSW may recommend one be undertaken at a later stage should information be provided such that the development is deemed to pose special problems of firefighting or special hazards exist that require additional fire safety and management measures.

Response

FRNSW's comments are acknowledged. No further response required.

4.6 NSW SES

Comment

A response was received from the NSW SES on 26 August 2024:

1. *The NSW SES recommends that consideration of flooding issues is undertaken in accordance with the requirements of NSW Government's Flood Prone Land Policy as set out in the Flood Risk Management Manual 2023 (the Manual) and supporting guidelines, including the Support for Emergency Management Planning and relevant planning directions under the Environmental Planning and Assessment Act, 1979.*
2. *The NSW SES has no objection to the proposal. The emergency management considerations, flooding and mitigation measures have been considered in the Environmental Impact Assessment. Some of the key considerations relating to emergency management were detailed in Appendix A of the NSW SES response dated 30 May 2024 and these have been addressed in the Environmental Impact Assessment.*

Response

1. Comment noted. The impact assessment for the project has been undertaken in accordance with the NSW Flood Prone Land Policy and the *Flood Risk Management Manual 2023.* Further information regarding potential flooding is provided in Section 4.2.
2. Comment noted.

4.7 DPHI – Crown Lands

Comment

DPHI – Crowns Lands stated that all comments have been addressed, and Crown Lands has no further comments in a response dated 21 August 2024.

Response

The DPHI – Crown Lands comments are acknowledged. No further response required.

4.8 CASA

Comment

CASA reviewed the Aviation Impact Assessment (AIA) prepared by Aviation Projects of July 2024 and provided a response on 5 August 2024.

CASA has no issues with the AIA and agrees with the Conclusions at Section 9 and the Recommendations at Section 10.

CASA provided the following responses to recommendations provided by the AIA:

– *Regarding Recommendation 2: It is expected that Port Macquarie Airport will request CASA to assess infringements of the Obstacle Limitation Surfaces by the crane. CASA will assess each case/location on its merits. For infringements of the Take-off and Approach Surfaces (and in some cases the Transitional Surfaces), conventional construction methods and/or scheduling may not be viable.*
– *Further to Recommendation 3: Port Macquarie Airport maintains a Wildlife Hazard Management Plan. And may choose to list the wastewater treatment plant as an Off-airport Land-use Habitat (if the evidence suggests).*

Response

CASA's comments are acknowledged.

Following the consultation process for the project, the TWWS network corridor alignment on the northern end of the Runway End Safety Area (RESA) is proposed to be amended to avoid the RESA area and manage potential construction machinery issues encroaching into this area. This amendment is shown in Table 4.6Table 4.5.

4.9 NSW DCCEEW – Heritage NSW

Comment

Heritage NSW made the following comments on 5 August 2024:

– *The ACHAR recommends that an archaeological test excavation program be undertaken to determine the nature and extent of Thrumster PAD 1 (AHIMS ID# 30-3-0390) within the area proposed for the wastewater treatment plant (WWTP) and associated laydown area. As standard practice, Heritage NSW requires that test excavations be undertaken prior to project approval to ensure that the significance of sites are understood, and that all cultural values are properly assessed and managed. We therefore request that test excavations be completed and the ACHAR be updated based on the results of this additional investigation.*
– *Please update the Test Excavation Methodology presented in Appendix 5 of the ACHAR to include provisions for employing alternative dating methods such as Optically Stimulated Luminescence (OSL) where stratified and/or intact deposits are encountered, and charcoal and/or shell is absent.*
– *Based on the current management recommendations for the project, it is unclear whether registered Aboriginal sites 'E1' (AHIMS ID# 30-3-0321) and 'Wattoo 2' (AHIMS ID# 30-3-0205) will be avoided and conserved or managed via community collection. Please clarify the stage at which the project design is currently at and confirm whether it is possible to undertake an updated impact assessment for those two sites to establish which management strategy is to be employed.*
– *Please clarify why a 10 m no-go buffer zone is proposed for 'E1' (AHIMS ID# 30-3-0321) while only a 5 m no-go buffer is proposed for 'Wattoo 2' (AHIMS ID# 30-3-0205) considering that both sites represent isolated artefacts.*
– *At various stages of the consultation process comments were received from representatives of Registered Aboriginal Parties indicating the cultural, environmental and archaeological significance of wetlands and swamps and concerns were raised in relation to the potential impacts of the proposed works on these environments. Please clarify how such comments/concerns have been addressed in the ACHAR.*
– *Please confirm why Registered Aboriginal Parties were provided only 14 days to review the draft Archaeological Test Excavation methodology considering that the Consultation guidelines generally requires provision of a 28-day review period for assessment methodologies.*
– *In relation to Section 4.1 and specifically the data presented in table 17, please consider whether the categories of AHIMS site types used to analyse site frequency are appropriate/accurate. For example, it is unclear what the different is (if any) between sites classified as 'Open Camp Sites' versus 'Artefact Scatters' or 'Artefact with PAD' and 'Artefact Scatter with PAD'.*

- *It is understood that Thrumster Sewerage 1 (AHIMS ID# 30-3-0405) represents the registration of the artefacts that were excavated during previous test excavations within Thrumster PAD 1 (AHIMS ID# 30-3-0390) and that they therefore essentially represent a duplicate recording of the same 'site' where different site features (i.e. 'PAD' and 'Artefact') have been registered separately.*

  Where the site status of Thrumster Sewerage 1 (AHIMS ID# 30-3-0405) is updated to 'destroyed' (as currently recommended in the ACHAR), Heritage NSW requests that the site card for Thrumster PAD 1 (AHIMS ID# 30-3-0390) also be updated to include 'Artefact' as a site feature consistent with the outcomes of the previous test excavations which have confirmed the presence of archaeological deposits.
- *Please confirm whether the AHIMS site card for Thrumster Sewerage 1 (AHIMS ID# 30-3-0405) has been updated to correct the co-ordinate reference system error identified in the ACHAR.*
- *Please confirm whether the AHIMS site card for Partridge Creek Swamp (AHIMS ID# 30-3-0121) as been updated to correct the location error identified in the ACHAR and to update the site status as being 'Destroyed' as per Recommendation 6.*
- *Heritage NSW notes that the AHIMS search is approaching 12 months old at time of submission. Where the ACHAR is updated to address the above comments, please also consider updating the AHIMS search and reviewing for currency in accordance with Requirement 1b of the Code of Practice.*

Response

Table 4.6 Key NSW DCCEEW – Heritage Assessment

Issue	Comment	Response
Archaeological test excavations	The ACHAR recommends that an archaeological test excavation program be undertaken to determine the nature and extent of Thrumster PAD 1 (AHIMS ID# 30-3-0390) within the area proposed for the wastewater treatment plant (WWTP) and associated laydown area. As standard practice, Heritage NSW requires that test excavations be undertaken prior to project approval to ensure that the significance of sites are understood, and that all cultural values are properly assessed and managed. We therefore request that test excavations be completed and the ACHAR be updated based on the results of this additional investigation.	Archaeological test excavations were undertaken from 18 to 22 November in order to determine the extent and nature of Thrumster PAD 1 (AHIMS ID# 30-3-0390) within the area proposed for the wastewater treatment plant (WWTP) and associated laydown area. The ACHA has been updated to include the results of this additional investigation. The revised ACHA would be appended to the Amendment Report which is to be issued to DPHI following this RtS report.
	Please update the Test Excavation Methodology presented in Appendix 5 of the ACHAR to include provisions for employing alternative dating methods such as Optically Stimulated Luminescence (OSL) where stratified and/or intact deposits are encountered, and charcoal and/or shell is absent.	The Test Excavation Methodology for the proposed test excavation at Thrumster PAD 1 (AHIMS ID# 30-3-0390) has been updated to include provisions for employing alternative dating methods such as Optically Stimulated Luminescence (OSL) where stratified and/or intact deposits are encountered, and charcoal and/or shell is absent. Due to the updates, the Test Excavation Methodology has been resubmitted to RAPs for a 28-day review period prior to test excavations. The updated methodology was sent to RAPs on 17 October providing a 28 day review period with the test excavation undertaken 18 to 22 November 2024.
Management recommendations and mitigation measures	Based on the current management recommendations for the project, it is unclear whether registered Aboriginal sites ‘E1’ (AHIMS ID# 30-3-0321) and ‘Wattoo 2’ (AHIMS ID# 30-3-0205) will be avoided and conserved or managed via community collection. Please clarify the stage at which the project design is currently at and confirm whether it is possible to undertake an updated impact assessment for those two sites to establish which management strategy is to be employed.	The mitigation and management recommendations outlined in Table 34 of the ACHA identify that for both ‘E1’ (AHIMS ID# 30- 3- 0321) and ‘Wattoo 2’ (AHIMS ID# 30-3-0205), the primary proposed mitigation measure is for both of these Aboriginal cultural heritage sites to be avoided and conserved. Both site locations have 5 m no-go zones in order to avoid any impacts and are not expected to require community collection if the proposed mitigation and management measurements are undertaken. A review of the project design and the impact to these sites is to be included within the updated ACHA inclusive of the test excavation program and updated accordingly as required. The revised ACHA would be appended to the Amendment Report which is to be issued to DPHI following this RtS report.

Issue	Comment	Response
	Please clarify why a 10 m no-go buffer zone is proposed for 'E1' (AHIMS ID# 30-3-0321) while only a 5 m no-go buffer is proposed for 'Wattoo 2' (AHIMS ID# 30-3-0205) considering that both sites represent isolated artefacts.	The ACHA report would be updated to rectify this inconsistency (it should have been a 5 m buffer for both sites). The ACHA with this recommendation update will go to RAPs for review after the results of the test excavation proposed at Thrumster PAD 1 (AHIMS ID# 30-3-0390) has occurred for a 28- day review period. The revised ACHA would be appended to the Amendment Report which is to be issued to DPHI following this RtS report.
Aboriginal Community Consultation	At various stages of the consultation process comments were received from representatives of Registered Aboriginal Parties indicating the cultural, environmental and archaeological significance of wetlands and swamps and concerns were raised in relation to the potential impacts of the proposed works on these environments. Please clarify how such comments/concerns have been addressed in the ACHAR,	Comments and concerns about the cultural, environmental and archaeological significance of wetlands and swamps have been considered in reviewing the archaeological potential of the project area, and been considered in the assessment, as well as incorporated into the report. Comments regarding this have been incorporated within Section 6 and Section 5.5.2 of the ACHA. Inclusion of the relevance of floodplain and swamp environments within the Thrumster area has been considered in the development of the predictive model in Section 4.6 of the ACHA with it being recognised that this landform has potential for Aboriginal cultural heritage sites and Aboriginal objects to be present, and a reiteration of this is discussed in Section 5.5.2 of the ACHA. The revised ACHA would be appended to the Amendment Report which is to be issued to DPHI following this RtS report. In addition, the swamp and wetland environment has been assessed environmentally, and is understood to not be an entirely intact setting, with drainage and the presence of existing infrastructure within the surrounds. Much of the proposed works will be relating to existing impacts and infrastructure to reduce the impact to the swamp and wetlands, and elevation of vehicle tracks, and infrastructure has been acknowledged to being implemented to assist in mitigating flood risks. However, the location in which the WWTP and laydown area are planned to occur have been identified to have had minimal subsurface disturbances, and due to the proximity to the wetlands/swamp, and proximity to Thrumster PAD 1 (AHIMS ID# 30-3-0390), these factors, and the comments/concerns provided by RAPs, assisted in determining the potential for the Aboriginal cultural heritage site to extend into this location, particularly due to the results of the ERM (2008) report and results of testing within this identified landform.

Issue	Comment	Response
		Niche has additionally updated the Test Excavation Methodology for the project to avoid important ecological and environmental zones identified within ecological assessments conducted for the project and have reviewed the methodology in order to reduce impacts to the wetland/swamp environment during the test excavation program and address any concerns regarding the programs impact to the wetland/swamp environment.
	Please confirm why Registered Aboriginal Parties were provided only 14 days to review the draft Archaeological Test Excavation methodology considering that the Consultation guidelines generally requires provision of a 28-day review period for assessment methodologies.	Niche has called RAPs in regard to the methodology provided in order to give the opportunity to provide comments in regard to the draft test excavation methodology during this period, of which some RAPs provided comment at the time. An updated Test Excavation Methodology was re-sent out to RAPs for a 28-day review on Thursday 17 October 2024.
AHIMS search, data and site cards	In relation to Section 4.1 and specifically the data presented in Table 17, please consider whether the categories of AHIMS site types used to analyse site frequency are appropriate/accurate. For example, it is unclear what the different is (if any) between sites classified as 'Open Camp Sites' versus 'Artefact Scatters' or 'Artefact with PAD' and 'Artefact Scatter with PAD'.	The updated ACHA has revised the site features as detailed in Table 18 and depicted in Figure 5 for greater clarity..The revised ACHA would be appended to the Amendment Report which is to be issued to DPHI following this RtS report.
	It is understood that Thrumster Sewerage 1 (AHIMS ID# 30-3-0405) represents the registration of the artefacts that were excavated during previous test excavations within Thrumster PAD 1 (AHIMS ID# 30-3-0390) and that they therefore essentially represent a duplicate recording of the same 'site' where different site features (i.e. 'PAD' and 'Artefact') have been registered separately. Where the site status of Thrumster Sewerage 1 (AHIMS ID# 30-3-0405) is updated to 'Destroyed' (as currently recommended in the ACHAR), heritage NSW requests that the site card for Thrumster PAD 1 (AHIMS ID# 30-3-0390) also be updated to include 'Artefact' as a site feature consistent with the outcomes of the previous test excavations which have confirmed the presence of archaeological deposits.	An update to both AHIMS site cards occurred prior to the test excavation with these site card updates approved on 19 November 2024. Subsequent to the completion of the test excavation program, ASIRF were submitted for both sites to include the results of testing and were approved on 3 December 2024.
	Please confirm whether the AHIMS site card for Thrumster Sewerage 1 (AHIMS ID# 30-3-0405) has been updated to correct the co-ordinate reference system error identified in the ACHAR.	An update to the AHIMS site card occurred prior to test excavation works with the update approved on 19 November 2024.
	Please confirm whether the AHIMS site card for Partridge Creek Swamp (AHIMS ID# 30-3-0121) has been updated to correct the location error identified in the ACHAR and to update the site status as being 'Destroyed' as per Recommendation 6.	An update to the AHIMS site card was submitted and approved on 18 November 2024 to update the location and 'destroyed' status of the site. Following an email request on 24 November 2024, Carlos Torres confirmed on 26 November 2024 that he had manually updated the site card record for the site to ensure that 'quarry' was removed.

Issue	Comment	Response
	Heritage NSW notes that the AHIMS search is approaching 12 months old at time of submission. Where the ACHAR is updated to address the above comments, please also consider updating the AHIMS search and reviewing for currency in accordance with Requirement 1b of the Code of Practice.	An updated AHIMS extensive search was undertaken on 22 November 2024 and incorporated into Appendix 3 of that report. The revised ACHA would be appended to the Amendment Report which is to be issued to DPHI following this RtS report.

4.10 NSW DCCEEW – Heritage Council of NSW

Comment

NSW DCCEEW - Heritage Council provided a response on 6 August 2024 as follows:

– *The site does not contain any known historical archaeological relics. Therefore, no heritage comments are required.*
– *The Department does not need to refer subsequent stages of this proposal to the Heritage Council of NSW.*

Response

NSW DCCEEW - Heritage Council's response is noted. The Heritage Council will not be further engaged regarding the proposal. No further response required.

4.11 DPHI - NSW Resources

Comment

A response was received from DPHI – NSW Resources on 16 August 2024 noting the following:

– DPHI - NSW Resources has identified no issues with the project at this stage.
– *NSW Resources notes the project intersects with Exploration License (EL) 9666, held by Asteroid Mining Australia Pty Ltd, was recently granted on June 25 2024, and recommends the proponent consult with the title holder.*

Response

DPHI – NSW Resources comment is noted.

Council has consulted the exploration title holder, Asteroid Mining Australia Pty Ltd regarding the project. A letter was sent on 20 February 2025. The correspondence is provided in Appendix C-8.

4.12 Transport for NSW

Comment

TfNSW provided the following responses on 20 August 2024:

– *TfNSW is currently developing a long-term solution to reduce congestion along the Oxley Highway which will include improvements to the Wrights Road, Lake Road and Clifton Drive/Fernhill Road intersections. If needed, this can be discussed further with TfNSW Development Services North team.*
– *Details for utility crossings of classified (State) roads will need to be provided. Crossings of classified (State) roads must be completed by trenchless excavation compliant with TS 02088/GTD 2018/002 Trenchless Excavation within the Easement of Roads and Maritime Infrastructure.*
– *Details for excavation adjacent classified (State) road infrastructure will need to be provided. Excavations within or with their influence zones, or temporary structures extending onto the road reserve and TfNSW easements must be compliant with TS 02715/GTD 2020/001 Excavation adjacent to Transport for NSW Infrastructure.*
– *TfNSW notes Council is seeking to reduce the 80 km/hr speed zone on Hastings River Drive to 60 km/hr.*
    - *TfNSW is responsible for the review, change and installation of permanent speed zones in NSW, and these reviews are undertaken in accordance with the NSW Speed Zoning Standard. Please refer to this Standard for further information on key factors influencing speed zones.*
    - *TfNSW recommend Council seek in-principle support to the proposed speed zone reduction Hastings River Drive. This request can be made in writing to the email address provided below and must include relevant information to justify the proposed reduction.*
– *TfNSW has recently completed a speed zone review on Fernbank Creek Road and the speed zone will be reduced to 60 km/hr for the full length of the road.*

Response

Table 4.7 Key TNSW issues and response

Issue	Comment	Response
Traffic and transport	TfNSW is currently developing a long-term solution to reduce congestion along the Oxley Highway which will include improvements to the Wrights Road, Lake Road and Clifton Drive/Fernhill Road intersections. If needed, this can be discussed further with TfNSW Development Services North team.	Comment noted.
	Details for utility crossings of classified (State) roads will need to be provided. Crossings of classified (State) roads must be completed by trenchless excavation compliant with TS 02088/GTD 2018/002 Trenchless Excavation within the Easement of Roads and Maritime Infrastructure.	Utility crossings of State Roads, including the Oxley Highway and Pacific Highway for this project, will be undertaken by horizontal directional drilling, in accordance with TS 02088/GTD 2018/002 Trenchless Excavation within the Easement of Roads and Maritime Infrastructure. Details will be provided to TfSW by the proponent. Details of consultation for the project (including TfNSW) are provided in Section 5 and Appendix C of the EIS. Liaison with TFNSW has already commenced, a liaison officer was nominated from TFNSW, initial requirements for road crossing alignment and construction methodology was discussed to minimize the impact on traffic and road users.
	Details for excavation adjacent classified (State) road infrastructure will need to be provided. Excavations within or with their influence zones, or temporary structures extending onto the road reserve and TfNSW easements must be compliant with TS 02715/GTD 2020/001 Excavation adjacent to Transport for NSW Infrastructure.	Response from Council: Liaison with TFNSW already commenced, liaison officer was nominated from TFNSW, initial requirements for road crossing alignment and construction methodology was discussed to minimize the impact on traffic and road users.
	TfNSW notes Council is seeking to reduce the 80 km/hr speed zone on Hastings River Drive to 60 km/hr. – TfNSW is responsible for the review, change and installation of permanent speed zones in NSW, and these reviews are undertaken in accordance with the NSW Speed Zoning Standard. Please refer to this Standard for further information on key factors influencing speed zones. – TfNSW recommend Council seek in-principle support to the proposed speed zone reduction Hastings River Drive. This request can be made in writing to the email address provided below and must include relevant information to justify the proposed reduction.	Comment noted. Council is not aware of any request to permanently reduce the 80 km/hr speed zone on Hastings River Drive to 60 km/hr. Council were involved in TfNSW's consultation on the proposed change to Fernbank Creek Road and implementation of the resulting speed zone change, however have not been advocating for further changes in this locality. A traffic management plan would be prepared for construction of the project. This would consider temporary traffic speed controls in these areas.

Issue	Comment	Response
	TfNSW has recently completed a speed zone review on Fernbank Creek Road and the speed zone will be reduced to 60 km/hr for the full length of the road.	Comment noted. The impact assessment for the project recommends that a construction zone speed reduction to 40 km/h on both sides of Hastings River Drive in proximity to Fernbank Creek Road be implemented. Any requirement for reduction in speed on Fernbank Creek during construction would be determined as part of a Construction Traffic Management Plan in consultation with Council. Council was notified of the outcomes of the speed zone review undertaken on Fernbank Creek Rd and prior to the implementation of the change. Noting that the change is TfNSW jurisdiction and, no objections were raised at that time. Council maintenance crews were subsequently engaged by TfNSW to implement the speed zone change (we installed the signage and temporary VMS boards to advise of the change in conditions at TfNSW's cost).

4.13 North Coast Population and Public Health

Comment

North Coast Population and Public Health made the following comment:

– *North Coast Population and Public Health supports the proposed Thrumster Wastewater Scheme for the Thrumster and Sancrox communities.*
– *The proposed treatment of wastewater and provision of recycled water are expected to minimise wastewater impacts to the environment, protect public health and support the increased residential growth that is occurring in the region.*
– *Port Macquarie Hastings Council has actively engaged with the public health unit throughout the project design and development.*

Response

North Coast Population and Public Health's comments are acknowledged. No further response required.

4.14 DPIRD – Agriculture

Comment

DPIRD Agriculture made the following comments on 8 August 2024:

– The EIS is considered to have adequately identified the potential impacts of the proposed development on agricultural land and agricultural land uses.
– The Department supports the inclusion of biosecurity risks and mitigation measures in the Construction Environmental Management Plan to minimise the potential for biosecurity risk during construction.
– DPIRD Agriculture supports specific biosecurity controls applicable to individual properties to be identified in consultation affected landowners.

DPIRD Agriculture provided no further requirements for the proposal.

Response

The DPIRD - Agriculture comments are acknowledged. No further response is required.

4.15 DPIRD Fisheries

Comment

DPIRD Fisheries made the following comments, received on 27 August 2024:

- DPIRD Fisheries notes that areas of KFH proposed to be intersected will be horizontally directionally drilled resulting in minimal impacts to these habitats.
- No disturbance to mangroves or saltmarshes is expected.
- The project has the potential to impact Priority Oyster Aquaculture Areas (POAAs) via operational water quality impacts from treated discharges to Kooloonbung Creek and emergency overflow discharges to Partridge Creek and Fernbank Creek. The project has potential for water quality impacts to occur from the operation of the project.
- The EIS does not include assessment or mitigation of impacts to the oyster industry.
- *Given the importance of the oyster industry within the Hastings River, DPIRD Fisheries recommends that the EIS is amended to include a specific section on the potential impacts of the operational water quality impacts to oyster aquaculture operations within the Hastings River.*

Response

Table 4.8 DPIRD Fisheries

Issue	Comment	Response
Oyster aquaculture	Given the importance of the oyster industry within the Hastings River, DPIRD Fisheries recommends that the EIS is amended to include a specific section on the potential impacts of the operational water quality impacts to oyster aquaculture operations within the Hastings River.	Water quality impact modelling was undertaken as described in Technical Report 1B - Operational Water Quality Impact Assessment, (Intrawater, 2024). This modelling included an assessment of impacts on oyster leases in Big Bay and Limeburners Creek. From this analysis, the impacts were predicted to be limited and indicated that the releases would have a low level of influence on the oyster leases. The risk of impacts on oyster leases was predicted to be limited due to the low pathogenic content of the Thrumster WWTP releases and also the extensive dilution provided for by the hydrodynamics within the lower estuary. Further details are presented in Sections 5.5 and 7.4 of the Technical Report 1B – Operational Water Quality Impact Assessment (Intrawater, 2024).

4.16 EPA

Comment

The EPA provided the following response:

Based on the information provided, the proposal will require an environment protection licence under sections 43, 47 and 48 of the Protection of the Environment Operations Act 1997 (POEO Act) for Sewage Treatment clause 36 of Schedule 1 of the POEO Act.

The EPA has reviewed the EIS and notes that the EIS does not provide all the information required by the Secretary's Environmental Assessment Requirements (SEARs). Additional information is therefore required to be able to assess the proposal.

The EPA provided comments on the following issues:

– Water quality:
  - *NSW Water Quality Objectives will not be met by the proposal*
  - *Assumed treated wastewater quality*
  - *Mitigation measures - opportunities for reuse of treated effluent*
  - *Monitoring requirements*
– Noise and vibration:
  - Operational - *No operational vibration impacts are anticipated given the distance between the nearest sensitive receivers to the WWTP and the pipelines will be buried underground.*
  - Construction
– Air
– Scheduled development works:
  - *The EPA considers that activities usually meet the definition of 'scheduled development work' in the context of Section 47 of the POEO Act if they are works on a premises which cause physical change to the environment, particularly if they have the potential to cause land, water, air or noise pollution.*
– Greenhouse gas emissions:
  - *Therefore, the proposal does not trigger any additional requirements under the Draft NSW EPA Guide for large emitters.*

Response

Table 4.9 Key EPA issues and response

Issue	Comment	Response
Water quality	*<u>NSW Water Quality Objectives will not be met by the proposal</u>* *The Operational Water Quality Impact Assessment (OWQIA) identifies that the current water quality objectives within the receiving environments of Kooloonbung Creek, Hastings River and Partridge Creek are not currently being achieved. Against the long-term median concentrations analysed, all monitoring sites are non-compliant with the water quality objectives for all the nitrogen and phosphorus indicators analysed. The assessment also identifies that the existing releases from the Port Macquarie WWTP have a major role in contributing to that poor water quality.* *The assessment also demonstrates that the project will not improve the environmental values of the receiving waterways over time. The OWQIA provides an indication of predicted compliance with relevant water quality objectives simulated from an average rainfall year.* *These predictions are based on the annual median model results. For key pollutants (nitrogen, phosphorus, chlorophyll a and enterococci), the annual median concentration is predicted to exceed the waterway objectives.* *The documentation provided does not include the raw data for analysis, so it is difficult for the EPA to determine if the median values are the most appropriate for adequate assessment of the potential impacts upon the receiving environment.*	The proposed release strategy was developed based on extensive investigations commissioned by Council over a number of years including Water Quality Objectives Modelling (WQOM), Options Assessments and Multi Criteria Analysis (MCA) studies. Throughout these investigations, Council has proactively included stakeholders in presentations on key findings and in a series of workshops that directed key decision-making processes. The stakeholder group incorporated government agencies including the EPA, DCEEWW, DPHI and DPIRD. The wastewater scheme is considered an essential service to meet urban growth in the region. The proposed release strategy that was finalised in November 2023 specifically aims to mitigate impacts on the environmental health of the Hastings River estuary. Options that were also considered were either deemed cost prohibitive (e.g. ocean outfall, ebb tide river mouth release) or detrimental to the ecosystem health of the Hastings River and/or its tributaries (e.g. direct release to Partridge/Fernbank creeks or Hastings River). The proposed wastewater treatment system is required to service projected urban growth in Port Macquarie's outer suburbs. Alternative scheme configurations were shown to have a higher potential impact to the Hastings River catchment as demonstrated in the MCA studies and section 2.6 of the EIS The proposal represents the discharge of treated effluent to Kooloonbung Creek via existing release infrastructure with the modern membrane filtration processes to provide a high-quality treated effluent. The proposed discharge is predicted to decrease existing concentrations of Chlorophyll-a and Enterococci, therefore introducing the potential to reduce risks of algal blooms and pathogens in the waterways. While it is acknowledged that compliance against the NSW Water Quality Objectives may not be met for several of the parameters analysed, the releases will generally only influence water quality in Kooloonbung Creek with aquatic ecology assessments (Technical Report 6 – H20 Consulting, 2024) identifying that impacts are anticipated to be relatively minimal and typically confined to edge effects around creek banks, that may express as an increased risk of eutrophication and reductions in infaunal diversity. Importantly the WQIA indicates the release strategy developed represents limited or negligible impacts on the Hastings River and its other tributaries. Environmental values for the overall Hastings River Catchment will be improved in comparison to potential other scheme configurations or treatment options for the population growth areas. Council plans to implement additional mitigation measures to further reduce the impact of treated effluent discharge on surface water. These measures include, but are not limited to: – Production and reuse of recycled water: Up to 4.7 ML/day of recycled water will be produced and reused to reduce the nutrient and contamination load entering Kooloonbung Creek. This initiative is planned for implementation between 2028 and 2029 we part of the Thrumster Wastewater Scheme (WWS)

Issue	Comment	Response
		– Future upgrade of Port Macquarie Wastewater Treatment Plant (WWTP): An upgrade to the Port Macquarie WWTP, which discharges into Kooloonbung Creek, will improve the quality of effluent discharge. This upgrade will be contingent on the commissioning of the Thrumster WWTP to free up capacity. – Leachate management solution: Construction and commissioning of a leachate management system at the Cairncross facility by 2028-2030 would help reduce the biological load and contamination discharged into Kooloonbung Creek. – Septage receival facilities at Thrumster WWTP: The establishment of septage receival facilities at the Thrumster WWTP (2028-2029) will reduce the load at the Port Macquarie WWTP's septage receival facility and provide the required redundancy. – Council is open to EPA setting initial EPL conditions and then confirming concentration requirements post commissioning. The following is also noted in relation to the comments: – While the comment accurately states that results are presented for an average rainfall year, results are included for three independent rainfall years ranging from low to high precipitation periods. For brevity, only selected results are included in the main body of the report, however a full set of results are presented in Appendices C, D, E and F. Each Appendix is referenced in the relevant results section of the report e.g. Section 5.2.1. – Annual medians have been included in the analysis as these are most applicable for comparison against the objectives. The annual median profiles are however supplemented by timeseries analysis at relevant sites within the waterways – Regarding the raw data, time series results are presented in the appendices – refer references in Sections 5.2.1, 5.3.1, 5.4.1 and 5.5.1. – It is noted that the WQOs are dated and do not represent the revision that is currently underway that are expected to provide more localised guidelines and objectives based on relevant EVs and existing water quality, which is relatively poor in Kooloonbung Creek.
	<u>Assumed treated wastewater quality</u> *The OWQIA provides the assumed treated wastewater quality for the Thrumster WWTP releases as median values only.* *If determined by way of approval, the EPA will issue a licence with 90th and 100th percentile concentration limits. These limits will be set in consideration of the effluent quality required to meet the long-term water quality objectives of the receiving waterway.* *From the information provided, it is difficult for the EPA to determine if the plant as proposed can achieve an effluent quality that is capable of achieving the long-term water quality objectives.*	As shown in the WQIA, the existing baseline and forecasted 'existing' background concentrations in Kooloonbung Creek are predicted to exceed the long-term water quality objectives for this waterway without the project. While the modernisation of the wastewater infrastructure provides a high quality of treated effluent, this will not be capable of lowering overall concentrations to meet the water quality objectives. Please also refer to comments of relevance above. Proposed 90th and 100th percentile concentration limits are provided in the Monitoring Requirements response below.

Issue	Comment	Response
	<u>Mitigation measures - opportunities for reuse of treated effluent</u> *The proposed re-use of recycled water is a valuable mitigation measure, however inclusion of the scheme (and subsequent reduction in discharges to the receiving environment) has not been included in the modelling scenarios, therefore its true value as a mitigation measure is not fully understood. The impact of implementing the recycled water scheme should therefore be further analysed.* *If the analysis is able to demonstrate an adequate level of mitigation, then commitments to its implementation should be made in the EIS as well as defined timelines to implement the scheme.* *It is recommended that the proponent then assess the potential residual impact of discharges (after mitigation measures) on the environmental values of the receiving waterway consistent with the National Water Quality Guidelines. Where relevant, the proponent should identify practical measures to address residual impacts, such as effluent reuse and/or additional treatment.*	It is proposed that the Thrumster WWTP will provide recycled water to the Thrumster Area 13 recycled water scheme. The recycled water demand from this scheme has been estimated based on the historical recycled water demand for the Port Macquarie area. The average recycled water demand for the area is 3.1 ML/day. This represents 33% of the 9.2 ML per day average dry weather flow of the proposed 40,000EP treatment plant. It is acknowledged that the use of recycled water significantly could reduce the flows and loads discharged to Kooloonbung Creek. Inclusion of the scheme would reduce loading to be more similar to baseline/background conditions, however the reduction in discharge volumes is not anticipated to reduce the predicted impacted water quality to meet water quality objectives. The following points are also noted with regards to the modelling basis: – Demand of recycled water may vary with climatic conditions – Supply will be limited prior to commissioning and operation of the scheme – The WQIA scenarios conservatively represent worst case conditions e.g. if the recycling scheme is offline, is determined to be cost prohibitive or fails to meet on-going DCCEEW regulatory approval conditions/ requirements.

<table>
<tr><th>Issue</th><th>Comment</th><th>Response</th></tr>
<tr><td></td><td><u>Monitoring requirements</u>
The EIS recommends that the location, type and frequency of the monitoring program will be developed in consultation with the EPA. The EPA agrees with this recommendation, however in order to adequately assess the proposal at this stage, the proposed 90th and 100th percentile concentrations must be provided.</td><td>The WQIA has provided estimates of median treated effluent concentrations. The table below indicates estimated 90th and 100th percentile concentrations based on the expected performance limits of the proposed treatment plant. It is recommended that sampling be undertaken weekly and that samples be grab samples.
<table>
<tr><th>Monitoring Location</th><th>Quality Characteristic</th><th>Long Term 90th Percentile</th><th>Maximum</th><th>Monitoring Frequency</th></tr>
<tr><td rowspan="8">MP1

From Effluent Storage Tank</td><td>BOD5 (mg/L)</td><td>10</td><td>15</td><td>Weekly</td></tr>
<tr><td>Total Suspended Solids (mg/L)</td><td>15</td><td>20</td><td>Weekly</td></tr>
<tr><td>Total Nitrogen (mg/L as N)</td><td>10</td><td>15</td><td>Weekly</td></tr>
<tr><td>Ammonia (mg/L as N)</td><td>1</td><td>5</td><td>Weekly</td></tr>
<tr><td>Total Phosphorus (mg/L as P)</td><td>1</td><td>3</td><td>Weekly</td></tr>
<tr><td>pH (pH Units)</td><td></td><td>8.5</td><td>Weekly</td></tr>
<tr><td>Oil & Grease</td><td>5</td><td>10</td><td>Weekly</td></tr>
<tr><td>Faecal Coliforms (FC/100ml)</td><td>200</td><td>600</td><td>Weekly</td></tr>
</table>
Further discussion regarding monitoring requirements are presented in Section 6.2 of Technical Report 1B - Operational Water Quality Impact Assessment (Intrawater, 2024).</td></tr>
<tr><td>Noise and Vibration</td><td><u>Construction</u>
The proponent must ensure that all feasible and reasonable mitigation and management measures, including those outlined in Section 6 of the NVA, are implemented prior to the commencement of construction activities. These measures should extend beyond community notification of upcoming works and consider community views in works programming and management.</td><td>Comment noted.</td></tr>
<tr><td>Air</td><td>Should the project be determined by way of approval, the EPA advises that impacts from dust and odour will be appropriately managed through the EPL.</td><td>Comment noted.</td></tr>
</table>

Issue	Comment	Response
Scheduled development works	*Should the project be determined by way of approval, the EPA recommends that the proponent considers the need to apply for an Environment Protection Licence (EPL) for scheduled development work. Scheduled development work for which a licence is required is defined in section 47 of the POEO Act (being generally work on premises, at which scheduled activities are not carried on, that is designed to enable scheduled activities to be carried on at the premises).* *The EPA considers that activities usually meet the definition of 'scheduled development work' in the context of Section 47 of the POEO Act if they are works on a premises which cause physical change to the environment, particularly if they have the potential to cause land, water, air or noise pollution.*	As outlined in Appendix B (B-2-3) of the EIS, the project is likely to trigger a need for a licence under Clause 36 of Schedule 1 of the POEO Act. Council currently holds five EPLs for its wastewater treatment plants operating in the LGA (EPLs No. 594, 589, 805, 804, 10339). The requirement for a new EPL for the project would be determined during the EIS process and in discussion with the EPA. Section 5.24 of the EP&A Act provides that an EPL cannot be refused if it is necessary for carrying out an approved SSI project and is consistent with the project approval. Early engagement with NSW EPA established that a new EPL would be required for the project covering both the treatment and discharge of treated effluent and recycled water production, distribution and reuse. It was noted the future EPL application may include requirements to demonstrate the adequacy of containment measures at site such as wet weather controls and sedimentation basins with baffles. Council will consider the benefits and need for an EPL during construction for scheduled development work in liaison with EPA.

5. Updated project justification

This section provides an updated justification for and evaluation of the project as a whole, incorporating any relevant issues raised in submissions and the applicant's response to these issues.

The project is considered to be justified because it:

– Responds to a critical, recognised need and is consistent with several state and regional government plans, policy and guidelines concerning water security.
– Improve the reliability, redundancy and resilience of wastewater infrastructure across the Port Macquarie-Hastings LGA.
– Provides short and long-term benefits to the wider Port Macquarie-Hastings LGA.
– Would not result in significant, adverse environmental, social or economic impacts.
– Is consistent with the principles of ecologically sustainable development, the objects of the EP&A Act and is considered to be in the public interest.

The issues raised in submissions to do not change the overall need or rationale for the Thrumster wastewater scheme. The project is required to address continued pressure on the existing Port Macquarie WWTP capacity and to provide an essential resource to service new growth areas in the Thrumster, Sancrox and Fernbank Creek areas of Port Macquarie. The project would support the growth of urban and industrial areas in these suburbs. This project will provide the required redundancy for Council's sewage treatment and reticulation network.

A project of this scale and geographical spread would inevitably have some potential impacts on the local environment and community, during construction and operation of wastewater infrastructure. As described in the EIS, the project would incorporate environmental management and design features to ensure the potential impacts are managed and mitigated as far as practically possible.

The project has been developed following a robust and iterative process that has involved substantial options analysis, design, environmental assessment, and stakeholder engagement. Where feasible and reasonable, the project has aimed to avoid and minimise biophysical, social and economic impacts. At this stage of assessment, a conservative worst-case assessment approach has been implemented. The potential residual construction and operational impacts of the project are considered manageable with the implementation of the proposed mitigation and management measures.

Overall, the project is a critical component in delivering reliable wastewater infrastructure to Port Macquarie-Hastings LGA and supporting the economic growth by providing the essential resources for key areas of urban development. Having regard to all of the matters considered in this EIS, it is considered that the project is justified, as the need for, and the benefits of the project would outweigh the residual impacts.

6. References

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SafeWork NSW (2023) Managing Risks of Hazardous Chemicals in the Workplace 2022.

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Sullivan, LA, Clay, C, Ward, NJ, Baker, AKM, and Shand, P (2018b) National Acid sulfate soils guidance: a synthesis, Department of Agriculture and Water Resources, Canberra, ACT.

Transport for NSW [TfNSW]. (2022). Construction Noise and Vibration Guideline.

Appendices

Appendix A

Register of submissions received

Table A.1 Register of submissions – State Government Agencies

State Government Agencies	Issue Category	Issue Sub-category
DPHI	Project	Underboring Wastewater Cumulative impact assessment
	Economic environmental social impacts	Biodiversity
		Aquatic ecology
		Water quality and hydrology
		Noise
		Land Use Conflict Risk Assessment
		Public Health and Safety
		Social Impact Assessment
		Ecologically Sustainable Development
		Soils and Contamination
		Traffic and Transport
		Air Quality
		Waste
		Services
New South Wales Rural Fire Service (NSW RFS)	Project	Design – APZ and Australian Standard AS3959-2018
NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) Biodiversity Conservation and Science Group (BCS) and National Parks and Wildlife (NPWS) joint response	Economic environmental social impacts	Biodiversity Water NPWS
Fire and Rescue NSW (FRNSW)	Procedural matters	Fire Safety Study
New South Wales State Emergency Service (NSW SES)	Economic environmental social impacts	Flooding issues
Department of Planning, Housing and Infrastructure (DPHI) – Crown Lands	No impacts identified	No impacts identified
Civil Aviation Safety Authority (CASA)	Legislation	Port Macquarie Airport
	Economic environmental social impacts	Wildlife Hazard Management Plan
NSW DCCEEW - Heritage NSW	Economic environmental social impacts	Heritage
NSW DCCEEW - Heritage Council of NSW	No impacts identified	No impacts identified
DPHI – NSW Resources	Economic environmental social impacts	Exploration License
Transport for NSW (TfNSW)	Economic environmental social impacts	Traffic – congestion and speed limits
North Coast Health District – North Coast Population and Public Health Directorate	No impacts identified	No impacts identified
Department of Primary Industries and Regional Development (DPIRD) - Agriculture	Economic environmental social impacts	Biosecurity
DPIRD – Fisheries	Economic environmental social impacts	Biodiversity – oyster aquaculture
EPA	Economic environmental social impacts	Water quality Monitoring Noise and vibration Air quality
	Procedural matters	Scheduled development works and Environmental Protection License

Table A.2 Register of submissions – Individual

Individual submission	Issue Category	Issue Sub-category
Port Macquarie Race Club	Project	Consultation with PMRC Alignment of project mains Impacts to PMRC
King & Campbell Pty Ltd	Project	Support
King & Campbell Pty Ltd on behalf of Swingaway Pty Ltd	Project	Support
King & Campbell – on behalf of Mr Shore, Mr and Mrs A and A Hudson and Mr and Mrs D and T Hore	Project	Support
King & Campbell on behalf of Expressway Spares Pty Ltd	Project	Support
King & Campbell on behalf of Alceon Group	Project	Support
Debra King	Project justification as a whole	Object
	Environmental impacts	Odour, air pollution and microorganisms Pollution of waterways
	Social impacts	Safety for school children Conduct of Council and sub-contractors
Hugh Smith	Environmental impacts	Odour Enclosing facility Comparability to Farley Plant
Simon Seidenman, Michael Munday, Robert Hough and Fernbank Creek Residents	Project justification as a whole	Object
	Environmental impacts	Impacts to Fernbank Creek
	Social impacts	Safety for school children Traffic
Name withheld	Project justification as a whole	Support
Name withheld	Project justification as a whole	Support
Hopkins Consultants	Project justification as a whole	Support
Geoff Freeman	Project justification as a whole	Support
Dr Adam King	Project justification as a whole	Object
	Project conduct	Conduct of Council and sub-contractors
	Community	Misleading site visit and information Community health impacts Lack of compensation for impacts
Michael Potter	Project justification as a whole	Object
	Environmental impacts	Noise Traffic Flood risk Impacts to cattle
	Social impacts	Property access Property value Community access to mains

Individual submission	Issue Category	Issue Sub-category
Elizabeth Dancet	Project justification as a whole	Object
	Environmental impacts	Odour Air quality Risk of contaminated water Noise and dust impacts
	Social impacts	Property value Community access to mains Road safety impacts Compensation

Appendix B

Updated management measures

Where mitigation measures have been updated, they are shown as:

– Strikethrough = ~~deleted measures or text.~~
– Bold = **new text or edit to existing mitigation measures**
– Highlighted grey = New measures.

Table B.1 Consolidated list of management measures for the project

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
Water Quality and Hydrology				
WQ1	Surface water, geomorphology	Implementation of a CEMP, a SWMP, an Acid Sulfate Soils Management Plan, and an ESCP in accordance with the Blue Book. This includes the staging of the WWTP, recycled water facility and pipeline construction into manageable portions.	Council/contractor	Pre-construction
WQ2	Soil and Water	During construction, collection of onsite runoff in established surface water drains and sediment basins.	Council/contractor	Pre-construction and construction
WQ3	Surface water	A Pollution Incidence Response Management Plan (PIRMP) would be implemented to manage operational impacts, including the management of emergency leaks and bursts.	Contractor	Construction
WQ4	Water quality	Baseline water quality monitoring will be undertaken targeting parameters related to potential erosion and sedimentation during construction. Matching datasets would be collected during and following construction and compared to the baseline data. See Section 1.6.1 for more details.	Council/contractor	Pre-construction, construction and post-construction
WQ5	Water quality	Water quality monitoring will continue to be undertaken by Council in receiving waters as outlined in Section 1.6.1.	Council	Operation
WQ6	Water quality	Identify opportunities for reuse of recycled water, which would reduce the volume of effluent discharged to the receiving waters.	Council	Anytime
WQ7	Flooding	A Flood Management Plan (FMP) to be developed as part of the SWMP or CEMP.	Council/contractor	Pre-construction
WQ8	Flooding	Flood proofing to be provided for all parts of the building up to FPL4. Preferably, this is to be achieved by filling the portion of the site containing the critical infrastructure; however, alternative methods may also be considered. These may include raise areas internal to building, bunding or local raising.	Council/contractor	Construction and Operation
WQ9	Flooding	Flood Proofing to be provided to all aspects of the proposed development up to FPL3.	Council/contractor	Construction and Operation
WQ10	Flooding	Compile a site Flood Emergence Response Plan which documents the responsible staff, flood characteristics, flood warnings, flood response including evacuation, emergency contacts, and flood recovery.	Council/contractor	Operation

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
WQ11	Geomorphology	An OEMP is also required to stipulate ongoing inspection requirements of pipeline corridors/discharge points after rainfall and flood events to identify any areas of erosion, off-site sedimentation, and poor vegetation establishment.	Council/contractor	Operation
WQ12	Groundwater	A trigger action response plan (TARP) approach will be implemented to minimise and respond to any groundwater interception such that impacts to existing groundwater are minimised.	Council/contractor	Pre-construction and Construction
WQ13	Groundwater	A trigger action response plan (TARP) approach will be implemented to minimise and respond to any groundwater interception such that impacts to existing groundwater are minimised. The Emergency Storage Pond will be constructed with an impermeable HDPE liner.	Council/contractor	Construction
WQ14	Groundwater	Implementation of an Operation Environment Management Plan which includes the implementation of typical control measures such as bunding, safely storing hazardous materials, and visual inspection of the works area and waterways, as well as pipeline maintenance. A Pollution Incidence Response Management Plan can also be utilized to manage operational impacts.	Council/contractor	Operation
Aboriginal Heritage				
AH1	Consultation with RAPs	The Proponent should continue to consult with the RAPs in regard to the project in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010*. Consultation may include, but is not limited to: – Finalisation of ACHA – Participation in the proposed ~~**test excavation/**~~community collection program – Determination of the long-term management of recovered artefacts under a care and control agreement – Project updates **and follow ups to ensure communication has been received.** – Unexpected finds Project updates should be sent to all RAPs every 6 months at a minimum to ensure the consultation associated with this ACHA remains active.	Council/contractor	Pre-construction/construction post construction
AH2	Preparation of an Aboriginal Cultural Heritage Management Plan	The Proponent should develop an Aboriginal Cultural Heritage Management Plan (ACHMP) for the project that includes: – The outcomes of the ACHA. – Measures agreed with the Traditional Owners for the protection and management of both tangible and intangible cultural heritage values and mitigation of impacts. – Agreed protocols for the identification, protection and management of any cultural heritage values discovered during the project. – Delivery of cultural awareness training to project staff and contractors to ensure that CHMP measures are implemented. RAPs should be included within the development of the ACHMP.	Council	Pre-construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
AH3	Buffer zones	No-go buffer zone extending ~~10~~ **five** (**5)** m must be established through temporary fencing around E1 (AHIMS ID# 30-3-0321) and a 5 m no go buffer zone established through temporary fencing around Wattoo 2 (AHIMS ID# 30-3-0205) prior to the commencement of works to ensure avoidance and prevention of any indirect impacts during works. If potential impacts to the sites cannot be avoided, the sites should be subject to community collection prior to the commencement of works and would require a subsequent ASIRF submission to update the site status in AHIMS.	Contractor	Pre- construction
~~**AH4**~~	Impacts to identified AHIM sites within, or in proximity, to the project area	~~An area of PAD associated with Thrumster PAD 1 (AHIMS ID# 30-3-0390) has been identified within the proposed WWTP and associated laydown area. A test excavation of the PAD identified in Figure 7 in Technical Report 2 - Aboriginal Cultural Heritage Assessment should be undertaken to determine the nature and extent of the PAD. The test excavation program should be undertaken prior to any proposed impacts. The Test Excavation Methodology has been prepared, and a copy of this, as reviewed by the RAPs is provided in Appendix 5 of the Technical Report 2 - Aboriginal Cultural Heritage Assessment. A program of community collection is also required at the site to recover surface artefacts present and should be undertaken prior to the proposed impacts.~~	~~Council~~	~~Pre-construction~~
AH4		The long-term management of ~~any surface or subsurface artefacts salvaged~~ **the single artefact salvaged** during the test excavation of Thrumster PAD 1 (AHIMS ID# 30-3-0390) should be formalised in a care and control agreement as determined by the RAPs. Where requested by the RAPs, the feasibility of on-Country reburial of artefacts within a conservation area should be considered by the Proponent.	Council	Construction/ Post-construction
AH5		The desktop assessment of Thrumster Sewerage 1 (AHIMS ID# 30-3-0405) and Partridge Creek Swamp (AHIMS ID# 30-3-0121) have determined that artefacts associated with both sites have previously been salvaged/collected. Aboriginal Site Impact Recording Forms (ASIRFs) ~~**should**~~ **have been** submitted to provide details of the ACHA findings and to update the site status of both sites.	Council	Pre-construction
AH6	Staff induction	All workers and contractors associated with the works within the project area should be inducted, so they are made aware of their obligations under the SEARs prior to, during and after works.	Contractor	Construction
AH7	Confidentiality	The Proponent should not publicise the location of Aboriginal cultural heritage sites or other cultural information without prior consent from the Aboriginal community. This includes the public distribution of any mapping, AHIMS data and/or cultural information contained within this report.	Council	Pre-construction/construction
AH8	Unexpected finds	In the event of unexpected finds, notification is required under section 89A of the NPW Act. During construction, all work in the area must cease immediately and: – The location, including a 20 m curtilage, should be secured using barrier fencing to avoid further harm. – Contact ~~**Niche**~~ **suitably qualified archaeologists** immediately. No further action is to be undertaken until archaeologists have assessed the finds.	Contractor	Construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
AH9	Human remains	In the unlikely event that suspected human remains are encountered during construction, all work in the area that may cause further impact must cease immediately and: – The location, including a 20 m curtilage, should be secured using barrier fencing to avoid further harm. – The NSW Police must be contacted immediately. – No further action is to be undertaken until the NSW Police provide written notification. – If the skeletal remains are identified as Aboriginal, the Proponent or their agent must contact: • Heritage NSW's Enviroline on 131 555 and representatives of the RAPs. • No works are to continue until Heritage NSW provides written notification.	Contractor	Construction
Non-Aboriginal Heritage				
HH1	Avoidance of harm to "Farm Dwelling and Shed" site.	If possible, works should be amended to avoid these structures. If not possible to do so, it is recommended that archival recording of the structure is undertaken prior to construction.	Contractor	Pre-construction
HH2	Location of project works	This assessment is confined to within the Subject Area defined in this report. The parameters of project works should not extend beyond these boundaries. Should planned works locations alter, further assessment of the potential impacts would be required.	Contractor	Pre-construction/Construction
HH3	Stop work in case of unexpected archaeological finds	In the event that unexpected historical heritage, including archaeological relics, is discovered during proposed works, all work in the immediate area will cease. A qualified archaeologist and, if necessary, Heritage NSW (in accordance with section 146 of the Heritage Act) should be contacted to assess the significance and advise on further requirements prior to the recommencement of works.	Contractor	Construction
Social				
SE1	Amenity and access impacts for local communities and landholders	A Communication Plan (CP) will be prepared and implemented as part of the Construction Environmental Management Plan (CEMP) to help provide timely and accurate information to the community during construction. The CP will include (as a minimum): – Mechanisms to provide details and timing of proposed activities to affected stakeholders, including changed traffic and access conditions. – Toll free number and email address for enquiries and complaints. – How the project webpage will be maintained for the duration of the proposal. – A complaint's handling procedure. – Consultation activities to be carried out.	Construction contractor	Pre-construction/ construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
SE2		Council will continue to consult with the community until completion of the project. This will include approaches to: – Consult with landowners, landholders, emergency services, schools, aged care facilities, businesses, community groups and community and recreation facilities in close proximity to the project to notify them about the project design, construction activities and timing of construction works. During operation of the project, this may include managing responses to enquiries and complaints and providing accurate and accessible information. – Identify and engage with vulnerable persons that might be affected by the proposal. – Communicate information about potential access changes and delays, including targeted communication to affected local stakeholders (e.g., affected residents, businesses, emergency services, bus services, community and recreation facilities).	Council	Pre-construction/ construction/ operation
S3		Property owners and occupants affected by acquisition will be consulted, and acquisition will be undertaken, in accordance the *Land Acquisition (Just Terms Compensation) Act 1991* and in accordance with the land acquisition reforms announced by the NSW Government in 2016.	Council	Pre-construction
SE4	Impacts on community and recreational facilities	Access to community facilities and infrastructure will be maintained during construction as far as practicable. Where alternate access arrangements need to be made, including changes to access for public and active transport facilities, these will be developed in consultation with relevant stakeholders and service providers, and communicated to users in accordance with the Communication Plan. Any changes to access arrangements will be managed in accordance with the Traffic and Access Management Plan.	Council Construction contractor	Pre-construction/ construction
SE5		Council will continue to consult with relevant key stakeholders in relation to community and recreation infrastructure with the potential to be directly affected (by the project's land requirements) and/or indirectly affected (for example, as a result of amenity impacts or access changes). Consultation will be undertaken in accordance with the Communication Plan and will assist with identifying measures to minimise the potential impacts of the project on community and recreation infrastructure as far as possible. Stakeholders to be consulted will include, but not be limited to, Hastings Birdwatchers, Friends of Kooloonbung Creek, Port Macquarie Airport, Port Macquarie Racecourse, **Saint Columba Anglican School, Busways, NSW Health (Port Macquarie Base Hospital),** Port Macquarie Rifle Club, Newman Senior Technical College, Glenfern Lifestyle Community, emergency services, and residential neighbours.	Council	Pre-construction/ construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
SE6	Local and First Nation employment and business opportunities	Council will maximise the participation of local, regional and First Nation businesses in the project, such as: – Preferential local and First Nation participation inclusions in tender documents which outline the sub-contracting and local employment goals that construction contractors would need to deliver. – Promotion of supply and employment opportunities through local industry channels and employment organisations. – Investigation of partnerships with local educational institutions and universities to support local residents to fill jobs during operation. – Explore opportunities to commission artwork from the local Aboriginal artists in design of the WWTP and RWTP to support interpretation and celebration of local Aboriginal community and culture.	Council Construction contractor	Pre-construction/ construction
Terrestrial Biodiversity				
B1	Biodiversity offsets	A total of 105 ecosystems credits and 895 species credits are required for the project in accordance with the Biodiversity Offset Scheme. Full details of the required ecosystem and species credits for the project are summarised in Table 37 and Table 38 in Technical Report 5 – Biodiversity Development Assessment Report.	Council	Pre-construction
B2	General	All workers are to be provided with an environmental induction prior to starting work on site. This would include information on the ecological values of the site, protection measures to be implemented to protect biodiversity and penalties for breaches.	Construction contractor	Prior to clearing/ construction works
B3		A Vegetation Management Plan (VMP) will be required for a duration of five years in order to guide the restoration or rehabilitation of the SRM and RWM and construction compounds. All areas of the SRM and RWM shall be revegetated with shallow rooted species of the PCT mapped in the area by this BDAR. Where exotic vegetation is indicated in this BDAR, the restoration may be with suitable native species of a local PCT or suitable exotic species that are not listed on the High Threat Weed list ((NSW DPE, 2022) as per Dorrough, Oliver and Wall (2018)). If areas of nearby conservation lands are impacted, they shall be added to the VMP.	Qualified ecologist or suitable council representative	Prior to clearing/ construction works/up to and including five years beyond construction completion.
B5		The contact details for the nearest Koala Hospital shall be kept at each site office during construction.	Construction contractor	Prior to clearing/ construction works and during construction works.

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
B6	Vegetation clearing	Limit disturbance of vegetation to the minimum necessary to undertake the project. Where possible in the implementation stage, undertake further refinement of the infrastructure such as the SRM and RWM to avoid impacts to biodiversity values including native vegetation, particularly Koala feed trees of the species Forest Red Gum (*Eucalyptus tereticornis*), Swamp Mahogany (*E. robusta*), Grey Gum (*E. propinqua*) Tallowwood (*E. microcorys*) and Bastard Mahogany (*E. paterntinervis (*a hybrid of *E. robusta and E. tereticornis*)).	Prior to works commencing.	Construction contractor and Project Ecologist
B7		Fencing and signage must be maintained for the duration of the construction period. Fencing should be designed to allow fauna to exit the site during clearing activities.	Prior to works commencing	Construction contractor and Project Ecologist
B8		Signage should be placed at the entrance to sites warning of the potential of Koala's to be present. The signs should contain details of the nearest Koala Hospital to facilitate prompt reporting of sick or injured Koalas.	Prior to works commencing	Construction contractor and Project Ecologist
B9		Native vegetation to be retained on site is to be protected in accordance with Development Control Plan 2014 Guidelines – Tree Preservation and Native Vegetation Management Guidelines (Section 6) and the Australian B9Standard AS4970-2009 – Protection of Trees on Development Sites.	Construction contractor and Project Ecologist	Prior to works commencing
B10		Stockpiles of soil, vegetation etc should be placed within existing cleared areas (and not within areas of adjoining native vegetation).	Construction contractor	Prior to clearing/ construction works.
B11		Sedimentation and erosion control measures including silt fencing, sediment traps, etc. to prevent sediment-laden stormwater exiting the construction areas and to prevent scouring and erosion of land beyond the development footprint. All erosion and sediment control measures are to be constructed and installed in accordance with relevant guidelines, are to be regularly maintained for the duration of the construction period and are to be carefully removed at completion of works. Sediment and erosion control measures should follow recommendations of The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom 2004). Dust suppression measures to ensure dust deposition beyond the construction area is minimised.	Construction contractor	Prior to clearing/construction works.
B12		In line with the Area 13 Koala KPOM (Figure 72), where koala food trees are removed, compensation should be provided by way of a minimum of four replacement trees (that are also preferred koala food trees) for every preferred koala food tree that is to be removed, such trees to be planted within a 100 m radius of those to be removed, and shall comply with Part 3(G)(iv) of the plan. Pre and post clearing reports are to be submitted to Council by the project ecologist for any significant vegetation removal.	Construction contractor and qualified ecologist	During construction works
B13	Introduction of weeds and pathogens	Develop a weed management approach to manage weeds and pathogens during the construction and operational phase of the project. Beginning at project construction, regular weed control shall be performed by a qualified individual. Weed control shall be performed regularly throughout the project. The location of significant environmental or priority weed infestations would also be identified and communicated to the contractor.	Construction contractor	Prior to clearing/ construction works/project lifespan

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
B14		The introduction and spread of weed species will be minimised by restricting access to areas of native vegetation and communicating the responsibilities of all Project personnel at site inductions and during regular toolbox meetings. All priority weeds identified on the site will be controlled and removed in accordance with the requirements of the *Biosecurity Act 2016* and Council's relevant Weed Control Manuals. Due to the sensitive nature of the lands to be impacted (surrounding wetland TECs and the possible contamination in the water treatment facilities by herbicide chemicals), weed control is not to involve the use of herbicides. Ongoing weed management shall be performed for at least five years following the project. All priority and environmental weeds will be cleared and stockpiled separately to all other vegetation, removed from site and disposed of at an appropriately licenced disposal facility. When transporting weed waste from the site to the waste facility, trucks must be covered to avoid the spread of weed-contaminated material. Disposal must be documented, and evidence of appropriate disposal must be kept. Waste management areas and processes are to be clearly identified.	Construction contractor	Prior to clearing/ construction works
B15		All machinery entering the site must be appropriately washed down and disinfected prior to work on site to prevent the potential spread of weeds, Cinnamon Fungus (*Phytophthora cinnamomi*), Myrtle Rust (*Austropuccinia psidii*) and Amphbian Chytrid Fungus (*Batrachochytrium dendrobatidis*) in accordance with the NSW hygiene guidelines for Phytophthora, Myrtle Rust and Amphibian Chytrid Fungus (NSW DPIE, 2020) for hygiene control.	Construction contractor	Prior to any plant or machinery being brought onto the site
B16		Incorporate control measures in the design of the project to limit the spread of weed propagules downstream of subject land. Sediment control devices, such as silt fences, would assist in reducing the potential for spreading weeds.	Construction contractor	Prior to clearing/ throughout construction works
B17		Construction activities will be managed through standard practices to avoid further spread of weeds and pests such as ensuring equipment and clothing are free of soil and vegetative matter prior to being brought to site, establishing vehicle cleaning stations with high pressure water hoses and brushes to remove soils, weeds and seeds; conducting regular vehicle inspections and restricting vehicle access zones and designated entry; ensure erosion controls are in place to minimise the spread of weed from run off (NSW Transport 2019).	Construction contractor	Prior to clearing/ throughout construction works
B18		Develop a weed management approach to manage weeds and pathogens during the construction and operational phase of the project. Beginning at project construction, regular weed control shall be performed by a qualified individual. Weed control shall be performed regularly throughout the project. The location of significant environmental or priority weed infestations would also be identified and communicated to the contractor.	Construction contractor	Prior to clearing/ construction works/project lifespan
B19	Removal of fauna habitat	Protocols to prevent introduction or spread of chytrid fungus should be implemented following Office of Environment and Heritage Hygiene protocol for the control of disease in frogs (DECC, 2008b).	Construction contractor	Prior to clearing throughout construction works

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
B20		Staged vegetation clearing shall be performed, commencing with the exotic dominated vegetation to increase the opportunity for fauna to vacate the site and disperse into areas of adjoining habitat to evade injury. Where higher condition vegetation is to be cleared, this shall be performed such that fauna species are directed away from threats such as roads and developed areas. Staged clearing should avoid creating an 'island' of habitat that is isolated from adjoining habitat.	Construction contractor	During clearing phase
B21		Pre-clearance fauna surveys, undertaken in accordance with the following procedure: – Land shall be broken into small units to stage the clearing activities such that a pre-clearing survey can clear the area with minimal time for mobile fauna (such as the Eastern Grass Owl, Giant Dragonfly and Swift Parrot) to re-establish within an area. The pre-clearing survey should be performed with the intention of flushing all fauna from the unit of land to be cleared within the Subject Land. Habitat features such as logs should also be checked. – Pre-clearing surveys shall ensure that habitat features, such as hollow-bearing trees are clearly identified.	Qualified ecologist	Prior to and during clearing works
B22		Clearing of hollow-bearing trees procedure. If possible, tree hollows should be inspected directly prior to felling. Before felling, the HBTs should be tapped along the trunk by heavy machinery to substantially shake the tree, with the intention of causing fauna to exit. Shaking should stop if fauna is observed to be leaving the tree. Where safe to do so, take the HBT down in stages, beginning with no-hollow bearing branches before moving towards the hollow. Where safe to do so, hollows should be cut around such that they remain intact and can be gently lowered to the ground. Hollows should be thoroughly checked following felling to ensure no fauna have become trapped or injured during operations.	Qualified ecologist and construction contractor	Prior to and during clearing works
B23		Trees should be felled into an already disturbed area to avoid damaging adjacent vegetation.	Qualified ecologist and construction contractor	During clearing works
B24		Consistent with the Area13 KPoM, the clearing of native vegetation and/or earthworks or for any other purpose must be temporarily suspended within a range of 25 m from any tree that is occupied by a Koala and must not resume until the koala has moved from the tree of its own volition. If a Koala does not voluntarily move on, it is to be removed by Port Macquarie Koala Hospital staff.	Qualified ecologist	Prior to and during clearing works
B25		Where appropriate, native vegetation cleared from the Subject Land should be moved into the retained vegetation as habitat or mulched for re-use on the site, to stabilise bare ground. Hollows may be reused elsewhere on site if suitable.	Construction contractor	During clearing phase
B26		A suitably qualified and appropriately licenced ecologist is to be present during clearing of all native vegetation to ensure felling of trees is limited to the least extent and carried out in an appropriate manner, and that any fauna present can be rescued and relocated. Appropriate fauna 'capture and release' techniques will be implemented.	Qualified ecologist	During clearing phase

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
B27		A suitably qualified and appropriately licenced ecologist will be present during the clearance of all native vegetation and/or fauna habitats. Animals that require handling must not be approached or handled until the ecologist is present, unless in an emergency (e.g. when there are both no authorised persons present and where the failure to immediately intervene would place the animal at significant risk). In such an emergency, the site manager may obtain over the phone instructions from the project ecologist to ameliorate the situation. A wildlife rescue organisation (e.g. FAWNA or Koala Conservation Hospital Port Macquarie) should be made aware of operations in case any injured fauna is found.	Qualified ecologist	During clearing phase
B28		Security lighting within the construction site is to be minimised and where required, is to be oriented such that light spill beyond the Subject Land and into patches of retained vegetation is minimised.	Construction contractor	During clearing phase
B29		A reduced speed limit should be implemented in the development area, accompanied by appropriate signage indicating the speed limit within the Subject Land. The speed limit determined should be appropriate for the area and potential risk to Koalas from vehicle strike.	Construction contractor	Prior to clearing/ construction works/up to and project lifespan
B30		All animals encountered will be treated humanely, ethically, and in accordance with relevant codes under the *NSW Prevention of Cruelty to Animals Act 1979*, including: – Australian code of practice for the care of animals for scientific purposes (NHMRC, 2013). – Code of practice for the welfare of wildlife during rehabilitation (Victoria, 2001). – Animal ethics considerations and protocols outlined in this document. If the project ecologist considers an animal is at risk of injury or undue stress, it is to be gently directed into secure adjoining habitat. Where deemed necessary by the project ecologist, the animal may be required to be captured and released. Capture and release operations will proceed via the following protocols: – All construction activities that are considered by the project ecologist be likely to increase the risk of injury, mortality or stress to the animal will be halted until the animal has been removed, which will be enforced with the co-operation of the Contractor. Construction activities that do not contribute to the risk of injury, mortality or stress to the animal can continue (as determined by the project ecologist). – Only qualified ecologists or wildlife carers are authorised to handle animals. – Animals will be captured (if required) by the project ecologist using a safe and ethical technique, as is appropriate for the particular species. Native animals that are unable to depart of their own accord will be captured and held in a receptacle appropriate for that species until release. All captive-held animals will be provided with food, water and warmth as is appropriate for the species. Each receptacle will only hold one animal at a time and will be cleaned and disinfected between use to avoid the spread of disease. Any fauna relocated from trees, shrubs or other areas would be recorded.	Qualified ecologist	During clearing phase

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
B31		The construction contractor is to contact the Project ecologist for advice if any unexpected fauna is found during the construction period (i.e. following clearing of native vegetation when the Project ecologist is no longer on site).	Construction contractor	During clearing phase
B32	Water quality and aquatic habitats	Erosion and sediment control plans should be prepared in accordance with The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom 2004). The erosion and sediment control plans would be established prior to the commencement of construction and be updated and managed throughout as relevant to the activities during the construction phase.	Construction contractor	Prior to construction commencing
B33		Soil stockpiles are to be placed away from, and ideally downslope of, receiving water bodies and drainage lines.	Construction contractor	During clearing phase
B34		Erosion and sediment control controls would be regularly inspected, particularly following rainfall events, to ensure their ongoing functionality.	Construction contractor	Weekly during construction phase or after any significant rainfall event
B35		Stabilised surfaces should be reinstated as quickly as practicable after construction.	Construction contractor	Immediately following clearing
B36		Appropriate speeds are to be enforced to limit dust generation and minimise chances of fauna mortality through vehicle strike.	Construction contractor	During construction
B37		Ensure vehicle and equipment parking areas and stockpile areas are identified and positioned to avoid areas containing ecological value.	Construction contractor	Prior to clearing/ construction works
B38		All stockpiled material should be stored in bunded areas and, where practicable, kept away from waterways to avoid sediment or contaminants entering the waterway.	Construction contractor	During construction
B39		Spill kits would be made available to construction vehicles. A management protocol for accidental spills would be put in place.	Construction contractor	During construction
Aquatic Ecology				
AE1	Trenching	The following recommendations will be considered to minimise impacts to aquatic and riparian habitats: – Any creek channels that require trenching to install the various mains will be re-instated to their original form or long-term stable condition in instances where this cannot be achieved or is undesirable. – Excavated bank and bed material will be stored (for return to the site at the completion of excavation) away from the waterway to minimise potential sedimentation of downstream habitats. – The backfilling of excavated creek banks or beds will use clean fill or the excavated sediments, ensuring adequate topsoil is maintained for revegetation works.	Contractor	Construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
		– Where creek bank vegetation is removed or damaged as part of trenching, their rehabilitation will be incorporated into the project Vegetation Management Plan (VMP). – Where established assemblages of native macrophytes are removed, weed management of the area should be included in the project VMP to minimise opportunistic replacement by exotic species. This may include monitoring via macrophyte mapping.		
AE2	Fish passage	Temporary barriers will be in place for less than six to twelve months (Fairfull 2013). Any barrier will be avoided in areas mapped as key fish habitat. Currently, barriers for construction are expected to be in place only if required and for a short period of time. Where temporary barriers are required to be in place for over 3 days, water quality monitoring should be considered upstream and downstream of the barrier to alert to potential detrimental habitat impacts for fauna in the vicinity.	Contractor	Construction
AE3		Where excavation works requiring bunding are to be conducted through waterways, adequate alternate fish passage will be provided for works where fish passage will be blocked for serval weeks or more due to construction. The use of HDD has been implemented as a less invasive methodology in most areas of KFH to avoid the obstruction of fish passage at these more sensitive habitats.	Contractor	Construction
AE4		Where possible, in-stream works will be staged to avoid blocking the entire waterway. If the entire waterway must be blocked, an alternative flow and passage channel should be considered to maintain natural flow conditions of the stream for the duration of construction works.	Contractor	Construction
AE5		Temporary in-stream structures will be installed during periods of low flow, with each structure to have a management plan included in the CEMP for high flow events to prevent erosion and sedimentation.	Contractor	Construction
AE6		Temporary barriers will not be comprised of loose, imported earth fill, with all material to be fully enclosed by geotextile, sheet piling or similar to prevent erosion and sedimentation.	Contractor	Construction
AE7	Dewatering	Prior to the commencement of dewatering inside any temporary barriers, a Dewatering Management Plan (DMP) that includes for translocation of any native fauna and management of exotic species will be prepared and undertaken by (or under the strict supervision of a suitable qualified aquatic ecologists). The DMP is required to address disposal of water, which will include the NSW DPI requirement that de-watering of a temporary in-stream structure will be pumped at least 30 metres from the waterway and not re-enter the waterway. A pre-works inspection will also be conducted by a qualified Aquatic Ecologist. Adequate sediment and erosion control structures will be erected to minimise sedimentation impacts.	Contractor	Construction
AE8	Water quality monitoring	Visual water quality monitoring will be implemented along the proposed HDD footprint during construction to alert to collapse of the creek bed. Council has an existing water quality monitoring program which would be continued. The protocols for management of water and dispersing bed sediments if the case of a collapse must be included in the projects Sediment and Erosion Management Plan.	Council/Contractor	Construction and operation

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
AE9	Acid Sulfate Soil	An appropriate Acid Sulfate Soils Management Plan must be prepared and implemented to prevent and minimise potential exposure of Acid Sulfate Soils to adjacent sensitive habitats.	Contractor	Pre-construction, construction and operation
A10	Onsite Water, Sediment and Erosion Management	Prepare an implement a Sediment and Erosion Management Plan that includes: – Placement of alternative routes at stable sections of watercourses to minimise additional erosion. – On-site water management to reduce sedimentation and potential pollution of watercourses at both at trenching sites. – Management of stormwater and creek water during periods of high flow, considering the presence of flood prone areas within and in the vicinity of the Study Area. – Installing site drainage infrastructure to lead stormwater away from site, particularly where stormwater may exacerbate soil erosion and pollution of waterways. – Diverting run-on water from disturbance works occurring on upslope land, using non-erosive methods. – Installing protective measures to prevent sheet erosion where large portions of soil will be exposed. These will also need to be located in location where they are not at risk during flooding. – Implementing water management controls as stated above to prevent sedimentation and erosion resulting from movement of water. – Construction of sediment filters or sediment retention traps where appropriate, particularly below fill batters near waterways.	Contractor	Pre-construction, construction and operation
A11	General construction	A CEMP is to be prepared and implemented for the project. The following will be included: – Adequately manage and store waste products and material in designated areas on the site. To prevent injury caused by ingestion or entanglement in debris, an adequate Waste Management Plan (WMP) should be prepared for the project. – All construction work locations are to have designated litter disposal bins to avoid potential for aquatic debris, included in the project WMP. – All machinery should be routinely checked for leaks, with an emergency spill kit to be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use. – All fuels and hydrocarbon-based products are to be stored in a sealed bunded area(s) at least 30 metres away from the water's edge. All vehicles and machinery should not enter the waterway except where absolutely necessary for installation of pipeline. Where they are required to enter the waterway a washdown procedure before doing so should be implemented.	Contractor	Pre-construction/ construction
A12	Unexpected encounter procedure	An appropriate unexpected encounter procedure will be included in the project's Flora and Fauna Management Plan (FFMP).	Contractor	Pre-construction, construction and operation

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
Traffic and Transport				
T1	Design	The design will continue to be refined to avoid or minimise on the surrounding road and transport network and property access, as far as reasonably practicable.	Council	Pre-construction
T2	Construction traffic	A traffic management plan (TMP) will be developed and implemented as part of the construction environmental management plan. The TMP is to include as a minimum: – Confirmation of haulage routes and access point. – Measures to maintain access and capacity to existing roads. – Measures to minimise conflicts with pedestrians and cyclists. – Traffic control measures including signage at appropriate locations to notify road users of increase traffic volumes. – A response plan for any construction related traffic incidents. – Consultant with emergency to ensure that procedures are in place to maintain safe, priority access for emergency vehicles. – Relevant traffic safety measures including driver induction, training, safety measures and protocols.	Contractor	Pre-construction, Construction
T3	Induction	All personnel will be inducted on the requirements of the TMP.	Contractor	Pre-construction, Construction
T4	Temporary lane/road closure	Road closures will be undertaken with the approval of the appropriate road authority and under the relevant road occupancy licence to be obtained prior to construction. Where feasible, road closures will be planned outside of the traffic peak to minimise the impact on the road network.	Contractor	Pre-construction, Construction
T5	Car parking	Sufficient car parking spaces will be provided within the project construction site and compounds to accommodate anticipated construction parking requirements.	Contractor	Construction
T6	Road safety – driver related	A Code of Conduct applicable to all construction workers will be developed and implemented which will define acceptable driver behaviour. The purpose of the Code of Conduct is to promote road safety and ensure that the impacts of construction-related vehicle movements on local roads and the local community are minimised. The Code of Conduct will be developed as part of a wider suite of documents under work health and safety requirements.	Contractor	Pre-construction, construction
T7	Community and stakeholder consultation	Community and stakeholder communication strategies will be established and implemented to notify the affected communities, visitors, emergency services and relevant road authorities in advance of any disruptions to traffic, anticipated delays, disruptions to property access and changes to travel routes. The strategies will be developed including details on communication channels, frequency of communication and response measures in relaying information to the community and stakeholders.	Contractor	Pre-construction, construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
T8	Consultation	Implement face-to-face consultation with landowners and tenants who will be directly affected, explaining construction processes and impacts to the surrounding area, answering questions they may have, and providing contact details that can be used for the project's entirety.	Contractor	Pre-construction, construction
T9	Environmental control	– All vehicles transporting loose materials will have the entire load covered and/or secured to prevent any large items, excess dust or debris depositing onto the roadway during travel to and from the site, including but not limited to construction rumble strips/wheels wash at the site egress location. – All vehicles leaving the site would be cleaned of materials that may fall on the roadway before they are allowed to leave the site. – The lead contractors will monitor the roads leading to and from the site and take all necessary steps to rectify any road deposits caused by site vehicles to maintain the safety of all road users. – Roads leading to and from the study area to be monitored for any road deposits caused from site vehicles and will be rectified as soon as possible. – Vehicles operating to, from and within the site shall do so in a manner which does not create unreasonable or unnecessary noise or vibration. – Public roads and access points will not be obstructed by any materials, vehicles, refuse skips or the like, under any circumstances. – All subcontractors must be inducted by the lead contractor to encourage that all the relevant procedures are met. – Water trucks will be used to supress dust as required.	Contractor	Construction
T10	Staff induction	All staff and subcontractors engaged on site will be required to undergo a site induction. The induction will outline the requirements on the CTMP, including site access routes, environmental and occupational health and safety responsibilities, emergency procedures, potential carpooling opportunities and vehicle height restriction under the power lines. Additionally, the Site Manager will discuss CTMP requirements regularly as a part of "toolbox talks".	Site Manager	Pre-construction
T11	Occupational health and safety	– Any workers required to undertake works or traffic control shall be suitably trained and hold the required accreditation to carry out works on site and will also be site inducted. – All traffic control personnel will be required to hold TfNSW accreditation in accordance with the TfNSW TCAWS manual.	Site Manager	Pre-construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
T12	Contact of emergency services	In the event of an emergency related construction traffic incident on the public road network, it will be the responsibility of the Site Manager to ensure that emergency services are notified. The emergency services include but are not limited to: – Fire – Ambulance – Police – Phone “000” in cases of emergency Furthermore, it is the responsibility of the Site Manager to advice the emergency services of any restriction of vehicular access to the public and private areas (1) one week prior to its implementation.	Site Manager	Pre-construction, construction, operation
T13	Certificates and approvals	Approval is to be obtained from TfNSW, Council and other relevant authorities as required. Approvals that may need to be obtained for items such as but not limited to: – Roadwork speed zone – Council Road opening permits – Road occupancy approvals – Hoarding/fencing approvals – Crane and barricades – Oversize and Articulated Vehicle use on local roads	Contractor	Pre-construction
T14	Obtaining road occupancy approvals	The Construction Contractor will obtain the necessary approvals, as required by the *Roads Act 1993* and NSW Traffic Acts and regulations, prior to conducting any works. The Construction Contractor is required to seek the concurrence of the relevant road authority prior to undertaking works. The Construction Contractor will ensure that all public roads to be used by construction traffic will be identified prior to construction and that management methods will be undertaken so that construction traffic uses the identified roads. The three specific areas of approval will include: 1. All construction works and/or any changes to existing infrastructure. 2. The installation and/or changes of any regulatory traffic control device. 3. Occupation of the road network to conduct works, and the associated installation of temporary traffic control devices.	Contractor	Pre-construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
T15	Roadwork speed limits	Temporary roadwork speed limits are one of many traffic controls that can be implemented to manage the speed of traffic approaching and passing through a work site. Roadwork speed zones must be logical and credible, as well as enforceable. When considering the use of roadwork speed zones, they will: – Only be used where they are self-enforcing or will be enforced. – Not be used alone but with other traffic control signs and devices. – Not be used in place of more effective traffic controls. – Only be used while road works are in progress or the lower speed road conditions exist.	Contractor	Pre-construction, construction
T16	Driver's code of conduct	A driver's code of conduct described how vehicles associated with construction activities are expected to behave. Typically, they will include: – The designated haulage routes and any restrictions. – Locations of rest stops. – Details around speed limits. – Protocols for dealing with the general public. – Emergency response protocols. – Details of driver responsibilities, including: • Ensuring that they are not suffering from fatigue or under the influence of drugs or alcohol. • Ensuring loads are appropriately covered. • Ensuring the use of appropriate personal and protective equipment. • Understand and abide by all road rules, including speed limits, road signs, use of seatbelts, avoiding taking unnecessary risks. • Required distances between vehicles to prevent convoying.	Drivers	Pre-construction, construction, operation
Air Quality				
AQ1	Dust	Prepare a dust control protocol that forms part of the Construction Environmental Management Plan (CEMP) to detail management measures, a method for recording dust complaints and monitoring requirements.	Contractor	Construction
AQ2	Dust	On days with forecast and actual high winds (i.e., over 10 m/s) reduce work effort accordingly if windblown dust is observed to be leaving the work area along the pipeline.	Contractor	Construction
AQ3	Dust, exhaust emissions	Plant and equipment should be maintained in good condition to minimise ignition risk, spills and air emissions that may cause nuisance.	Contractor	Construction
AQ4	Dust	Regularly water spraying of exposed areas.	Contractor	Construction
AQ5	Dust	Long term stockpile seeding.	Contractor	Construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
AQ6	Dust	Covering of long and medium term stockpiles and of all stockpiles in high wind periods.	Contractor	Construction
AQ7	Dust	Covering of truck loose material loads.	Contractor	Construction
AQ8	Dust	If the works are creating levels of dust which may significantly impact on residential amenity, the works should be modified or stopped until the dust hazard is reduced to an acceptable level.	Contractor	Construction
AQ9	Dust	On days with high background dust levels (due to fire or offsite dust events for example), increase dust mitigation in the form of watering or reduce dusty construction activities.	Contractor	Construction
AQ10	Dust	Revegetate and regularly water all disturbed areas as soon as practicable.	Contractor	Construction
AQ11	Dust	During construction in higher risk areas (areas within 2 m of the sensitive receptors, shown in Figure 14-1), conduct a daily inspection along all adjacent receptors for evidence of: – Dust deposition on residential private property including cars, letterboxes or balconies. – Evidence of mud or dirt tracked onto roadways. – The worksite adjacent receptors to check stockpiles are covered or the surface is sufficiently moist.	Contractor	Construction
AQ12	Dust	During construction in higher risk areas (areas within 20 m of the sensitive receptors, shown in Figure 14-1) implement additional watering (>2 litres/m^3/hr) when dust is being generated and winds are blowing towards the receptors.	Contractor	Construction
AQ13	Odour	Establish 24 hour emergency maintenance agreements with equipment manufacturers to limit the impact of equipment failures.	Council	Operation
AQ14	Odour	If elevated odour is observed during operation, undertake investigations to identify the source and minimise emissions. Record investigations and actions taken to minimise odour emissions in a log.	Council	Operation
AQ15	Odour	If an OCU is to be installed, implement a variable air flow system to reduce the number of air volume changes per hour through the OCU when works are emitting odour concentrations which may impact the nearby receptors.	Contractor	Operation
Soils and Contamination				
SC1	Contaminated Soil Management Plan (CSMP)	Development of a Contaminated Soil Management Plan (CSMP) to manage any contamination encountered during the construction of the project and to ensure the completed works are suitable for the intended land use.	Council/contractor	Pre-construction
SC2	Further contamination delineation	Provision for further detailed assessment where appropriate to confirm the conclusions of this preliminary assessment and to determine whether any specific remediation or management of areas is required. The further assessment should be based on the following: – Potential areas and types of contamination identified in this assessment. – The potential for exposure to workers and to end-users based respectively on the nature of the proposed construction works and the final design of the project.	Council/contractor	Pre-construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
SC3	Contamination exposure	Appropriate management controls to minimise the potential for exposure of contamination to workers and recreational users within the project both during and post construction. Description of appropriate excavation, validation, management and/or disposal requirements for potentially contaminated materials, if identified by further assessment or encountered during the construction of the project.	Council/contractor	Pre-construction
SC4	Assessment protocols	Sampling and analysis requirements for assessment of potential contaminated soils for re-use or for waste classification prior to offsite disposal.	Contractor	Construction
SC5	Contingency plans	Contingency plans including unexpected finds protocols for potentially contaminated soils (if encountered) including landfill or anthropogenic waste and PACMs.	Council/contractor	Pre-construction
SC6	NOA Management Plan	Development of an NOA Management Plan to provide a framework for safely working with NOA encountered during the construction and operation of the project.	Council/contractor	Pre-construction
SC7	Acid Sulfate Management Plan	An Acid Sulfate Soil Management is to be implemented for pipe infrastructure installations during excavation works.	Contractor	Construction
SC8	Documentation	Any future contamination reports should be prepared and reviewed by an appropriately qualified environmental consultant.	Council/contractor	Pre-construction
Waste and Chemicals Management				
WC1	Waste generation	Ensure that detailed design includes measures to minimise excess waste generation. Include a focus on optimising earthworks design to minimise excess spoil volumes and maximise the reuse of material on site and minimising the WWTP construction footprint. Pipe and pump wells will be retained and relined to reduce construction waste.	Council/contractor	Detailed design
WC2	Waste classification	Classify waste in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014) and manage in accordance with the POEO Act and associated regulations.	Contractor	Construction and operation
WC3	Emergency response	Prepare an emergency response plan prior to construction of the project, detailing hazardous materials, emergency procedures, resources, activation of the plan, reporting and termination of an emergency, etc.	Contractor	Pre-construction, construction
WC4	Construction waste	Prepare a Construction Waste Management Plan (CWMP) prior to construction of the project. Adopt the circular economy principles and the waste hierarchy contained in the *Waste Avoidance and Resource Recovery Act 2001*. Detail processes, responsibilities, and measures to manage waste and resource use, and minimise the potential for impacts during construction.	Contractor	Pre-construction, construction
WC5	Chemical storage	Prepare a Chemical Storage and Management Plan prior to operation of the project, detailing the safe handling procedures, labelling requirements, training and responsibilities. Prepare an emergency response plan would be developed prior to the operation, outline hazardous materials, emergency procedures, resources, activation of the plan, reporting and termination of an emergency, etc.	Contractor/Council	Operation

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
WC6	Operational waste	Prepare an Operation Waste Management Plan prior to operation of the project. Adopt the circular economy principles and the waste hierarchy contained in the *Waste Avoidance and Resource Recovery Act 2001*. Detail processes, responsibilities, and measures to manage waste and resource use and minimise the potential for impacts during operation.	Contractor/Council	Operation
WC7	Sludge management	Ensure dewatered sludge is stored properly in covered areas to minimise the risk of odour, runoff and potential contamination.	Council	Operation
Noise and Vibration				
Airborne noise/ground-borne noise and vibration				
NV1	Implement stakeholder consultation measures	Periodic notification (monthly letterbox drop and website notification) detailing all upcoming construction activities delivered to sensitive receptors at least 7 days prior to commencement of relevant works. In addition to Periodic Notification, the following strategies may be adopted on a case-by-case basis: – Project specific website – Project Infoline – Construction response line – Email distribution list – Web-based surveys – Social media – Community and stakeholder meetings – Community based forums (if required by approval conditions)	Contractor/Council	Pre-construction
NV2	Register of noise and vibration sensitive receptors	A register of most affected noise and vibration sensitive receptors (NVSRs) would be kept on site. The register would include the following details for each NVSR: – The address of the receptor – Category of receptor (e.g., Residential, Commercial etc.) – Contact name and phone number The register may be included as part of the Project's Community Liaison Plan or similar document and maintained in accordance with the requirements of this plan.	Contractor	Pre-construction
NV3	Construction hours and scheduling	Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Work generating noise with special audible characteristics and/or vibration levels should be scheduled during less sensitive time periods.	Contractor	Construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
NV4	Construction respite period	Noise with special audible characteristics and vibration generating activities (including jack and rock hammering, sheet and pile driving, rock breaking and vibratory rolling) may only be carried out in continuous blocks, not exceeding three hours each, with a minimum respite period of one hour between each block. 'Continuous' includes any period during which there is less than one hour respite between ceasing and recommencing any of the work. No more than two consecutive nights of noise with special audible characteristics and/or vibration generating work may be undertaken in the same NCA over any 7-day period, unless otherwise approved by the relevant authority.	Contractor	Construction
NV5	Site inductions	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: – All relevant project specific and standard noise and vibration mitigation measures. – Relevant license and approval conditions. – Permissible hours of work. – Any limitations on noise generating activities with special audible characteristics. – Location of nearest sensitive receptors. – Construction employee parking areas. – Designated loading/unloading areas and procedures. – Site opening/closing times (including deliveries). – Environmental incident procedures.	Contractor	Pre-construction, construction
NV6	Update Construction Environmental Management Plans	The CEMP must be regularly updated to account for changes in noise and vibration management issues and strategies.	Contractor	Pre-construction, construction
Source measures				
NV7	Plan worksites and activities to minimise noise and vibration	Plan traffic flow, parking, and loading/unloading areas to minimise reversing movements within the site.	Contractor	Pre-construction, construction
NV8	Equipment selection	Use quieter and less vibration emitting construction methods where feasible and reasonable. For example, where piling is required, bored piles rather than impact-driven piles will minimise noise and vibration impacts. Similarly, diaphragm wall construction techniques in lieu of sheet piling, will have significant noise and vibration benefits.	Contractor	Construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
Airborne noise				
NV9	Behavioural practices	– No swearing of unnecessary shouting or loud stereo/radios on site. – No dropping of materials from height, throwing of metal items and slamming of doors. – No excessive revving of plant and vehicle engines. – Controlled release of compressed air.	Contractor	Pre-construction, construction
NV10	Maximum noise levels	The noise levels of plant and equipment must have operating Sound Power or Sound pressure levels compliant with the allowable noise levels in Appendix C of CNVG.	Contractor	Pre-construction, construction
NV11	Rental plant and equipment	The noise levels of plant and equipment items are to be considered in rental decisions and in any case cannot be used onsite unless compliant with the allowable noise levels in Appendix C of CNVG.	Contractor	Construction
NV12	Use and siting of plant	– Simultaneous operation of noise plant within discernible range of a sensitive receptor is to be avoided. – The offset distance between noise plant and adjacent sensitive receptors is to be maximised. – Plant used intermittently to be throttled down or shut down. – Noise-emitting plant to be directed away from sensitive receptors.	Contractor	Pre-construction, construction
NV13	Non-tonal reversing alarms	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all vehicles and mobile plant regularly used on site and for any out of hours work, including delivery vehicles.	Contractor	Pre-construction, construction
NV14	Minimise disturbance arising from delivery of goods to construction sites	– Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receptors. – Select site access points and roads as far as possible away from sensitive receptors. – Dedicated loading/unloading areas to be shielded if close to sensitive receptors. – Delivery vehicles would be fitted with straps rather than chains for unloading, wherever possible.	Contractor	Construction
NV15	Construction related traffic	– Schedule and route vehicle movements away from sensitive receptors and during less sensitive times. – Limit the speed of vehicles and avoid the use of engine compression brakes. – Maximise on-site storage capacity to reduce the need for truck movements during sensitive times.	Contractor	Construction
NV16	Silencers on mobile plant	Where possible reduce noise from mobile plant through additional fittings including: – Residential grade mufflers. – Damped hammers such as “City” Model Rammer Hammers. – Air Parking brake engagement is silenced.	Contractor	Construction
NV17	Prefabrication of materials off-site	Where practicable, pre-fabricate and/or prepare materials off-site to reduce noise with special audible characteristics occurring on site. Materials can then be delivered to site for installation.	Contractor	Pre-construction, construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
NV18	Engine compression brakes	– Limit the use of engine compression brakes at night and in residential areas. – Ensure vehicles are fitted with and maintained original equipment manufacturer exhaust silencer or a silencer that complies with the National Transport Commission's 'Inservice test procedure' and standard.	Contractor	Pre-construction, construction
Path controls				
NV19	Shield stationary noise sources such as pumps, compressors, generators, fans etc.	Stationary noise sources would be enclosed or shielded whilst ensuring that the occupational health and safety of workers is maintained. Appendix F of AS 2436: 1981 lists materials suitable for shielding.	Contractor	Pre-construction, construction, operation
NV20	Shield sensitive receptors from noisy activities	Use structures to shield residential receptors from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when situating plant.	Contractor	Pre-construction, construction, operation
NV21	Additional mitigation measures	Where impacts from construction noise are unavoidable and it is not feasible to achieve the construction noise objectives, additional measures such as letter box drops, and phone calls are proposed in line with Table 6.3 in Technical Report 11 – Noise and Vibration Assessment.	Council/contractor	Pre-construction, construction
Land Use and Property				
	Impacts on land use and property	The design will continue to be refined to minimise land requirements and potential impacts on land uses and properties as far as reasonably practicable. Consultation with landowners/landholders will be ongoing to confirm feasible and reasonable measures to minimise impacts on their properties.	Contractor	Pre-construction, construction and operation
	Impacts on land use and property	Construction planning will minimise the duration that land is required to the shortest possible duration, particularly where the land requirements affect recreation/nature reserve areas.	Contractor	Pre-construction and construction
	Land requirements and property acquisition	All property acquisitions will be undertaken in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991* and the land acquisition reforms announced by the NSW Government in 2016.	Council	Pre-construction
	Impacts on utilities	The location of all utilities and services, and requirements for access to, diversion, protection and/or support, will be confirmed prior to construction. This will include (as required) undertaking utilities investigations, including intrusive investigations, and consultation and agreement with service providers.	Council	Pre-construction and construction
	Rehabilitation of land subject to temporary use during construction	Land subject to temporary use for construction will be rehabilitated as soon as practicable to the pre-construction condition (or as agreed with the landowner/landholder), taking into consideration the existing condition, location and land use characteristics. Rehabilitation will be undertaken in consultation with the relevant landowner/landholder, and in accordance with the rehabilitation strategy.	Contractor	Construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
	Biosecurity	Biosecurity controls will be implemented to minimise the risk of off-site transport or spread of disease, pests or weeds. Controls will be in accordance with *Come clean, go clean* (Qld Government, 2022) and include development of specific controls if high biosecurity risks are identified. Appropriate measures will be implemented with respect to foot and mouth disease to control any risk of introduction via the project. The specific controls applicable to a property will be identified in consultation with the affected landowner. The effectiveness of these controls will be monitored in a manner and time interval consistent with the level of risk on each property. In the event of new infestations of notifiable weeds as a result of construction activities, the relevant control authority will be notified as per *Biosecurity Act 2015* (NSW) and Biosecurity Regulation 2017.	Contractor and Council	Construction and operation
	Property management	A property management plan will be developed for directly impacted properties in consultation with landowners and stakeholders. The property management plans will outline the protocols that will be implemented to address landowner concerns during construction. This may include: – The process for rectification of any damage to property infrastructure caused by construction. – The process for rehabilitation and stabilisation of disturbed areas following the completion of construction. – Measures to minimise disruption to agricultural practices during construction. – Any fencing and gate requirements. – Specific biosecurity protocols.	Contractor	Pre-construction and construction
Hazard and Risk				
HR1	Personal injury caused by vehicle interactions	– Traffic management plan including standard traffic rules, signage – Site speed limits – One way traffic movement through the site for delivery vehicles – Designated pedestrian areas – Driver competency – Construction management plan	Contractor	Pre-construction
HR2	Natural hazards causing personal injury, plant shut down and possible fire	– Structures and tanks designed to appropriate codes and standards – Housekeeping standards – Site drainage	Council/contractor	Pre-construction, construction, operation
HR3	Toxic release of chlorine	– Implementation of standard operating procedures for drum transfer and connection and ensure personnel have been trained to reduce risk of drum damage during operation and delivery. – Notification to Safework NSW of exceeding 10% of the WHS schedule 15 threshold for chlorine. – Standard procedure for delivery of drums.	Council	Operation

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
		– Safe piping design. – Inspection and maintenance strategies.		
HR4	Contact with chemicals	– Training of staff prior to handling. – Staff wear appropriate PPE when handling corrosives. – Storage as per appropriate standards. – Safe work method statements.	Contractor/Council	Construction, operation
HR5	Spill of chemical solutions leading to soil contamination/degradation	– Storage as per appropriate standards, including bunding. – Design of pipework to standards, corrosion allowances where appropriate. – Inspection and maintenance strategies. – Spill management procedures. – Ensuring regular maintenance schedules are developed to detect leaks and ensure pipe fittings are in good condition.	Contractor/Council	Construction, operation
HR6	Access	Ensuring the site has an emergency plan for onsite staff taking the effect zone of all hazard scenarios into consideration such that the evacuation point is outside the AEGL 3 effect zone.	Contractor/Council	Construction, operation
HR7	Emergency Access	Coordination with emergency services for off-site management if a loss of containment event was to occur.	Contractor/Council	Construction, operation
HR8	On-site hot works	Prohibited on all days of Severe, Extreme and Catastrophic Fire Danger. At all other times: – Hot works requires inclusion in the Job Safety Analysis (JSA). – All hot work would require issue of a hot work permit. – All fire prevention measures (fuel free clearance zone around hot work site; wetting down measures and spark guards) specified in the JSA and/or hot work permit to be undertaken. – Fire extinguishers or other fire response apparatus required by the JSA and/or hot work permit must be present at the work site. – Upon completion of hot works appropriate checks to be undertaken to ensure no fire or smouldering material remains.	Contractor/Council	Construction, operation
HR9	Vehicle exhaust system contact with long grass	Vehicle access onto areas other than on constructed roads and laydown areas prohibited on all days of Extreme and Catastrophic Fire Danger. At all other times avoid parking in long grass.	Contractor/Council	Construction, operation

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
HR10	Sparks from metal on metal or rock friction during ground engaging machinery operation	– Prohibited on all days of Extreme and Catastrophic Fire Danger. – Grass fire ignition prevention requires inclusion in the Job Safety Analysis (JSA) for all earthmoving and hole boring works. – Fire extinguisher to be carried on all earthmoving machinery and present at all hole boring operations.	Contractor/Council	Construction, operation
HR11	Discarded cigarette butts from smokers	No smoking on project area except in designated smoking areas at the construction office site or laydown areas.	Contractor/Council	Construction, operation
HR12	Chemical reaction between hazardous materials stores or used on the WTP site	– Separate storage areas for hazardous chemicals. – Operating protocols for mixing of chemicals on site. – No WTP process which involve mixing of chemicals in the open are adjacent to the site permitter/in proximity to bushfire fuels.	Council	Operation
HR13	Bushfire protection	Project to be undertaken to comply with relevant PBP objectives relating to access, water supply and services and emergency and evacuation planning as detailed in Technical Report 15.	Contractor/Council	Pre-construction, construction, operation
HR14	Obstacle Limitation Surface (OLS)	Detailed planning and communication process need to be undertaken for preparation of CEMP for the Work. And the CEMP to be approved by the Airport Operation. That is more involved than liaison and seeking permissions. As temporary Closure of the airport activities during construction need to be provisioned by the airport operations. Prior written approval shall be obtained from the airport operator for any crane that may be used during the construction phase to penetrate the Obstacle Limitation Surface (OLS). To avoid doubt about whether an approval is required, applicants should check with the airport operator as soon as possible. Port Macquarie Airport Operations may be contacted on 0418 408 529 or via email at airport.operations@pmhc.nsw.gov.au (Noted, Port Macquarie Airport has already been contacted and received advice; refer to Section 4).	Contractor	Pre-construction
HR15	Wildlife hazard	The project would be within a 3 km wildlife control zone (Zone A), which requires wildlife hazards to be mitigated. Where ‘mitigate’ is indicated, proposed development of this land use type should be assessed by a wildlife hazard expert and potential wildlife attractants be suitably mitigated either before the development is approved or as a condition of the approval. Where approved, information regarding the development should be provided to the relevant airport operator and it should be included in future monitoring activity undertaken by the relevant airport operator.	Contractor/Council	Pre-construction, construction
Coastal Erosion				
No mitigation or management measures				

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
Landscape Character and Visual Amenity				
LV1	Lighting	Any lighting during construction would be of short duration. Lighting would not be directed or spill into any adjoining landholding. Occupants of adjoining landholdings will be advised of any unlikely night-time construction and the proposed lighting requirements.	Contractor	Pre-construction
LV2	Lighting	During operation of the WWTP and SPSs, lighting will be provided in accordance with AS 4282 – *Control of the obtrusive effects of outdoor lighting*. This Standard specifically refers to the potentially adverse effects of outdoor lighting on nearby residents. Design of outdoor lighting will be required to control any obtrusive effects to an acceptable degree.	Operator	Operation
LV3	Works areas during construction	During construction, work areas will be kept tidy and clear of rubbish, stockpiles appropriately contained, and equipment, plant and parking managed and contained within identified works areas.	Contractor	During construction
Greenhouse Gas				
GHG1	Construction related emissions produced by vegetation removal	Reuse vegetation removed from the project area to be mulched or composted where possible.	Council/Contractor	Construction
GHG2		Consideration of options for revegetation near the project site (beyond any biodiversity offsets required) to reduce the project's carbon impact.	Council	Construction/operation
GHG3	Construction related emissions produced by vehicle and equipment use	Investigate substitution of fuels with sustainable fuels such as B10 biodiesel or renewable hydrogen.	Council/Contractor	Construction
GHG4		Use of electric construction plant and vehicles for the construction works where reasonable and feasible.	Contractor	Construction
GHG5	Construction related emissions produced by electricity consumption	Investigate opportunities for on site power generation through solar panels or source electricity from renewable sources.	Council/Contractor	Construction
GHG6	Operational related emissions produced by methane	Explore an alternative to flaring such as using the captured methane as an energy source to substitute a portion of the WWTP's grid electricity requirements or, if possible, piping it into the natural gas supply.	Council	Operation
GHG7	Operation related emissions produced by electricity consumption	Where it's not possible to avoid carbon emissions, reducing emissions should be considered in the first instance. Energy efficient electrical equipment (pumps, treatment equipment etc) should be specified to reduce the electrical consumption of the WTP.	Council	Operation
GHG8		Further investigate options for onsite power generation through solar installations on the roof of the wastewater treatment plant.	Council	Operation
ESD	Sustainability	The project would be designed and constructed in accordance with the sustainability objectives.	Council/Contractor	Pre-construction, construction

Ref	Impact/Issue	Mitigation measure	Responsibility	Timing
Cumulative Impacts				
CL1	General impact reduction	The mitigation measures presented in this table will be implemented effectively to reduce the project's cumulative impact on the environment.	Council/Contractor	Pre-construction, construction, operation

Appendix C

Supporting information, including any detailed engagement or technical reports

C-1 Kooloonbung Creek hydrodynamic analysis

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2nd December 2024

Thrumster Wastewater Scheme – Kooloonbung Creek hydrodynamic analysis

1 Background and scope

As a product of the consultation period for the Environmental Impact Statement for the Thrumster Wastewater Scheme, the following comments were received from the Department of Planning, Housing and Infrastructure (DPHI) in relation to hydrodynamics in Kooloonbung Creek.

- *Provide an estimate of the volume of tidal water that passes the hydraulic gradient change at the Gordon Street Bridge in a typical tidal cycle, compared to the volume of additional treated effluent that would be disposed of to Kooloonbung Creek each day.*
- *Provide an estimate of the increase in height of the water level in Kooloonbung Creek due to the additional effluent that would be disposed into the Creek.*

To provide preliminary responses to these requests, Intrawater has undertaken additional modelling and analysis of the hydrodynamics in Kooloonbung Creek. This technical note presents the findings of this analysis.

The following scope of works has been undertaken.

- Review of the model setup in the reaches of interest, with addition of analysis markers to allow output of relevant model results in the vicinity of Gordon Street bridge.
- Identification of a period of representative operating conditions for the WWTPs which allows for analysis of a “typical” tidal cycle. In this instance it is assumed that “typical” refers to operation and tidal action under dry weather conditions.
- Run the model for a one-month period that represents generally dry weather conditions without the Thrumster WWTP releases.
- Run the model for the same period with inclusion of the Thrumster WWTP releases.
- Undertake analysis of the differences in flow characteristics and water elevations between the two scenarios and how this varies over a range of tidal cycles.

2 Analysis and interpretation

2.1 Simulation period

The simulation period selected for the analysis consisted of four weeks within March 2016. This period fell within the average rainfall simulation year that was applied in the modelling for the Water Quality Impact Assessment (Intrawater, 2024). As presented in Figures 2-1 and 2-2 below, this represented a generally dry period allowing for focussed analysis of contributions from the WWTPs and the tidal influences on the flows in Kooloonbung Creek.

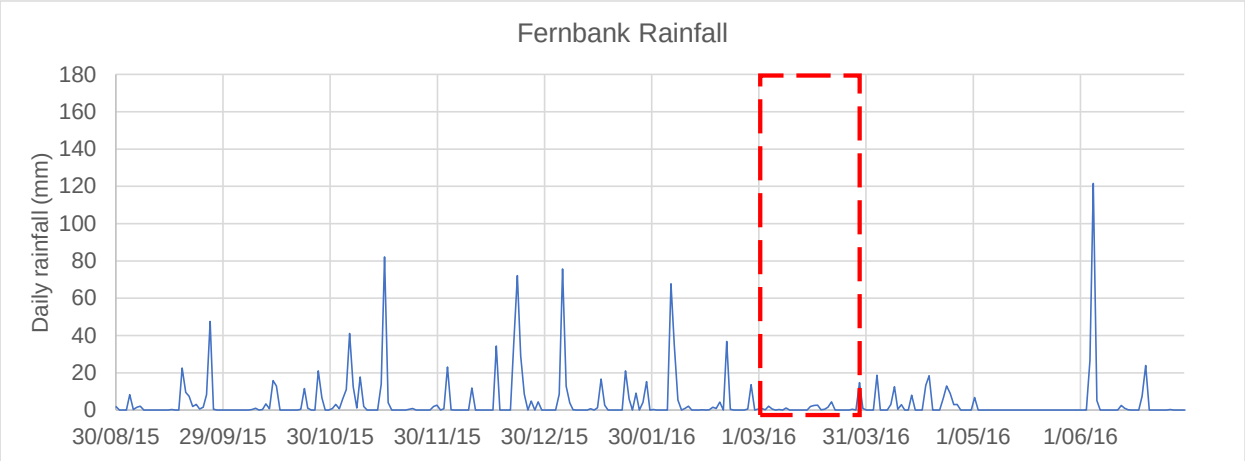

Figure 2-1 Daily rainfall for the Fernbank catchment (2015-16)

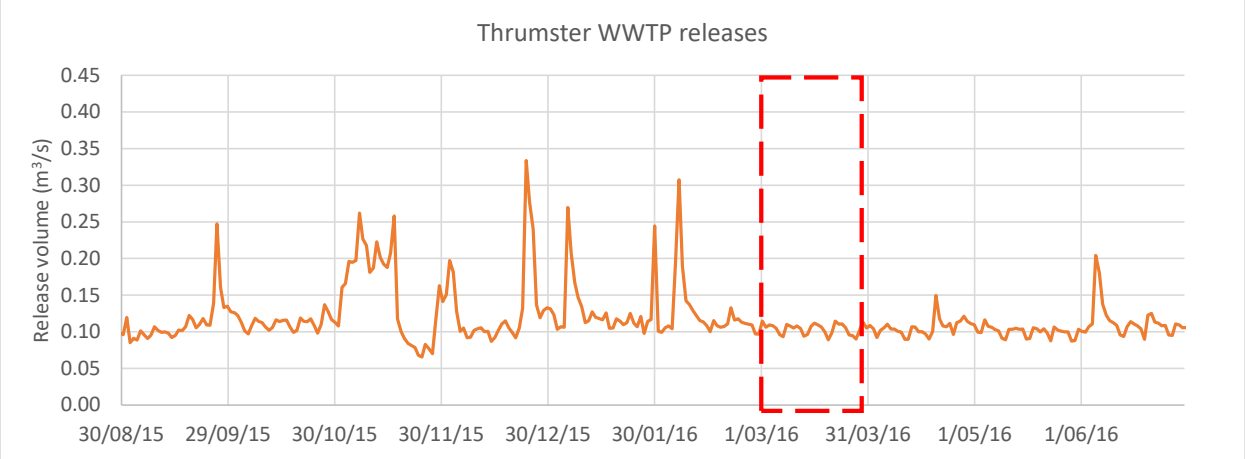

Figure 2-2 Release volumes for the Thrumster WWTP to Kooloonbung Creek (2015-16)

2.2 Model results

2.2.1 Tidal flows

Figure 2-3 presents the predicted flows at Gordon Street bridge for the Baseline (circa 2023/24) conditions as well as with the addition of Thrumster WWTP releases, with an assumed ADWF release rate of 9.2 ML/d. Water elevation data is also presented to aid interpretation.

Similarly, Figure 2-4 presents the predicted flows at Gordon Street bridge for the Background (circa 2058) conditions as well as with the addition of Thrumster WWTP releases, with an assumed ADWF release rate of 9.2 ML/d.

Key differences between the two aforementioned sets of results relate to modifications made to the future (circa 2058) scenario conditions. More specifically, changes in land use and also modifications

implemented to represent climate change. Of particular note is an assumed increase in sea level and a corresponding increase in tidal prism.

Figures 2-5 and 2-6 present the predicted instantaneous residual flows for the two time horizons due to the introduction of the Thrumster WWTP releases i.e. the difference in flow due to the inclusion of the Thrumster releases.

Table 2-1 presents the predicted average tidal flow volume that passes under the Gordon Street bridge for all the scenarios simulated. These volumes were estimated by calculating the total cumulative volume predicted by the model during the 28 day simulation period and dividing by the number of tides simulated.

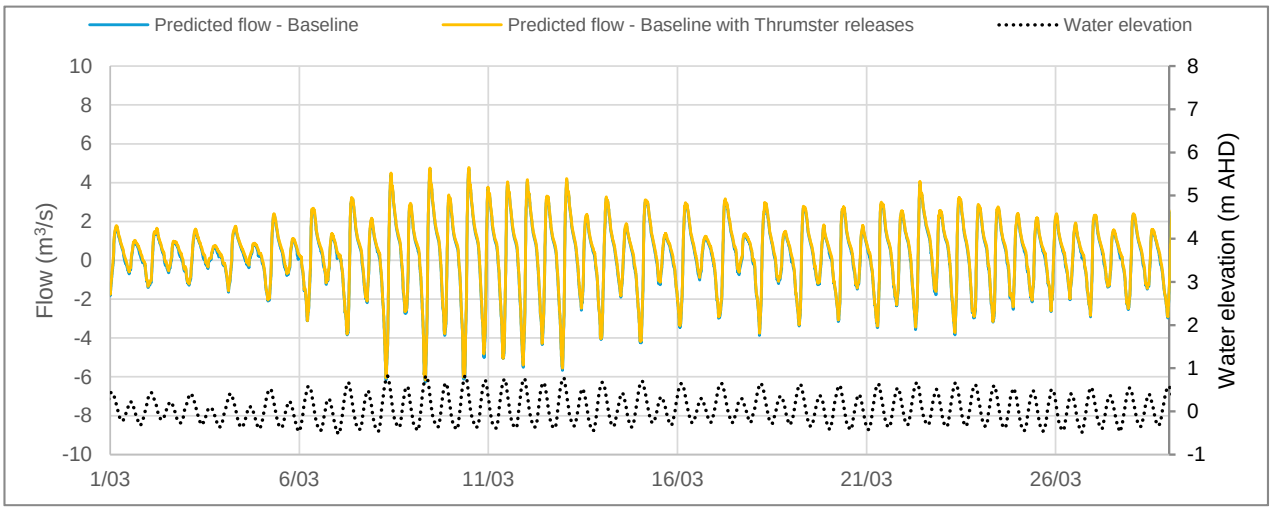

Figure 2-3 Predicted flows at Gordon Street bridge for baseline conditions (circa 2023/24) and with addition of the Thrumster releases

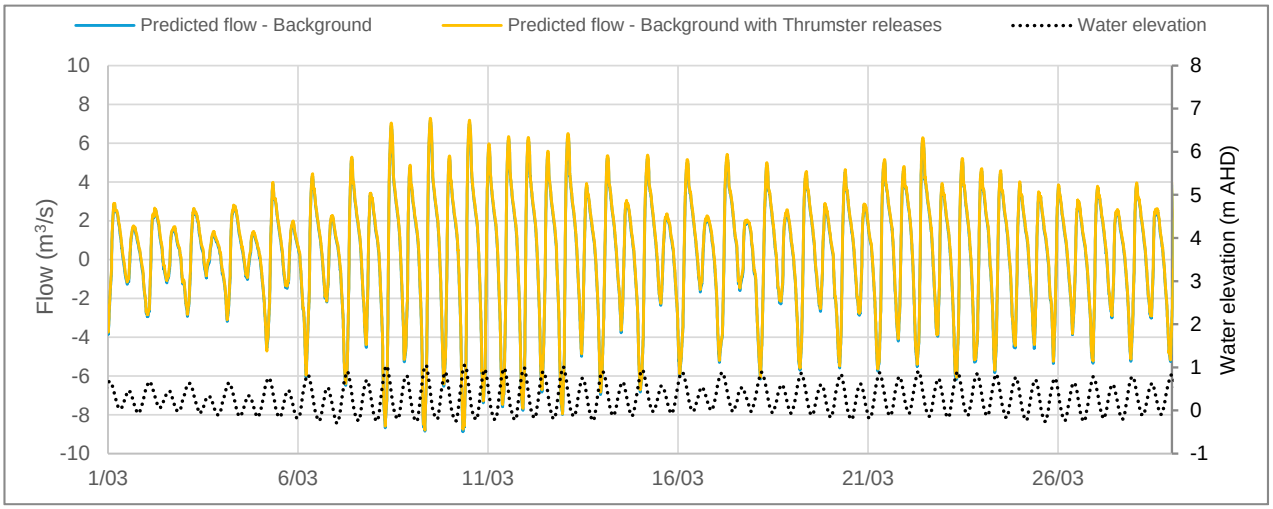

Figure 2-4 Predicted flows at Gordon Street bridge for background conditions (circa 2058) and with addition of the Thrumster releases

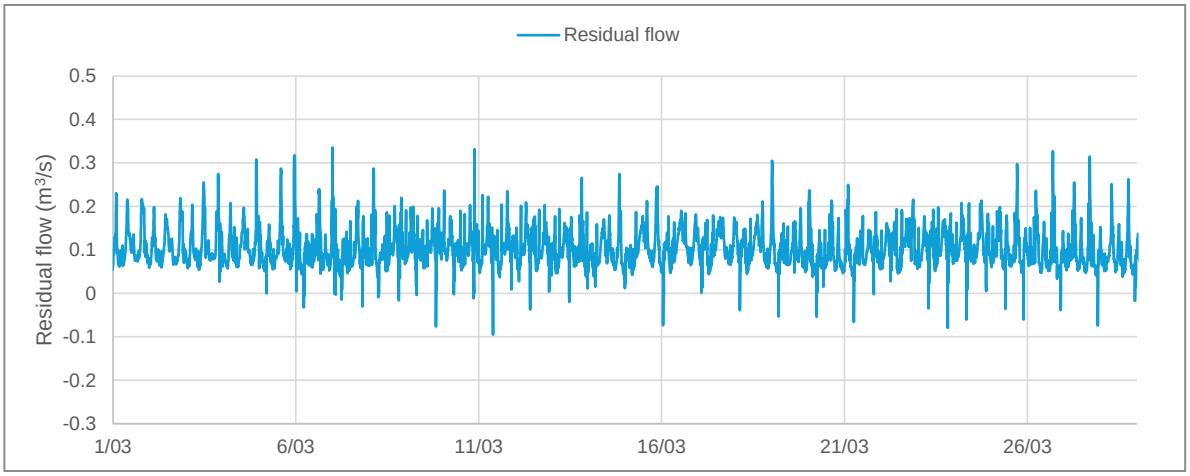

Figure 2-5 Predicted residual flows at Gordon Street bridge relative to baseline conditions (circa 2023/24)

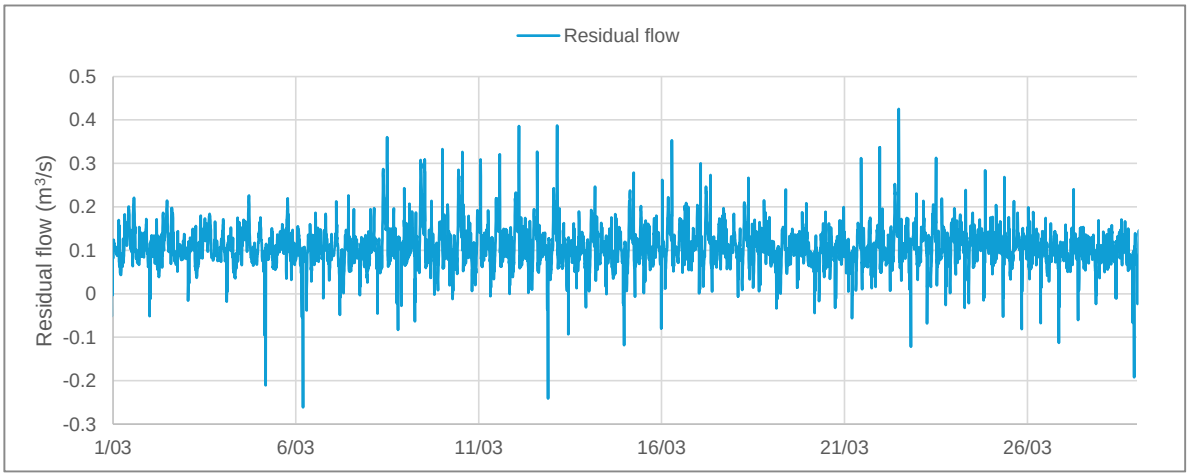

Figure 2-6 Predicted residual flows at Gordon Street bridge relative to background conditions (circa 2058)

Table 2-1 Predicted average tidal flow volume at Gordon Street bridge.

Scenario	Predicted average tidal flow volume (ML)
Baseline (circa 2023/24)	63.1
Baseline (circa 2023/24) with Thrumster releases	64.0
Background (circa 2058)	110.8
Background (circa 2058) with Thrumster releases	111.8

2.2.2 Tidal elevations

Figure 2-7 presents the predicted water elevations at Gordon Street bridge for the Baseline (circa 2023/24) conditions, as well as with the addition of Thrumster WWTP releases, with an assumed ADWF release rate of 9.2 ML/d.

Similarly, Figure 2-8 presents the predicted flows at Gordon Street bridge for the Background (circa 2058) conditions as well as with the addition of Thrumster WWTP releases, with an assumed ADWF release rate of 9.2 ML/d.

As discussed in Section 2.2.1, the key differences between the two aforementioned sets of results relate to modifications made to the future (circa 2058) scenario conditions. More specifically, changes in land use and also modifications implemented to represent climate change.

Figures 2-9 and 2-10 present the predicted instantaneous differences in water elevation for the two time horizons due to the introduction of the Thrumster WWTP releases i.e. the difference in water level predicted at the bridge due to the inclusion of the Thrumster releases.

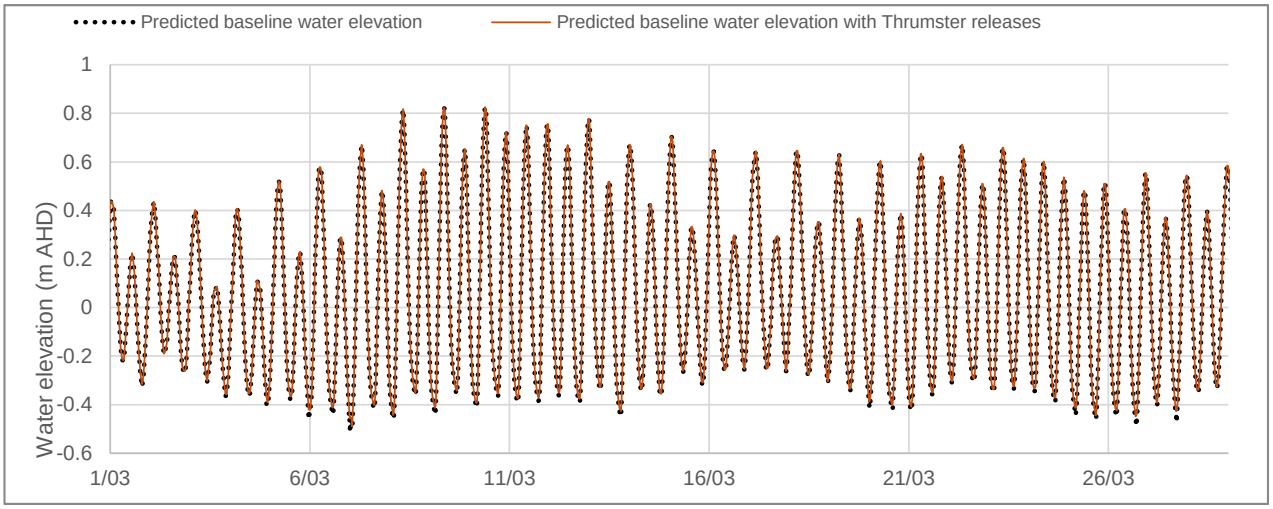

Figure 2-7 Predicted water elevations at Gordon Street bridge for baseline conditions (circa 2023/24) and with addition of the Thrumster releases

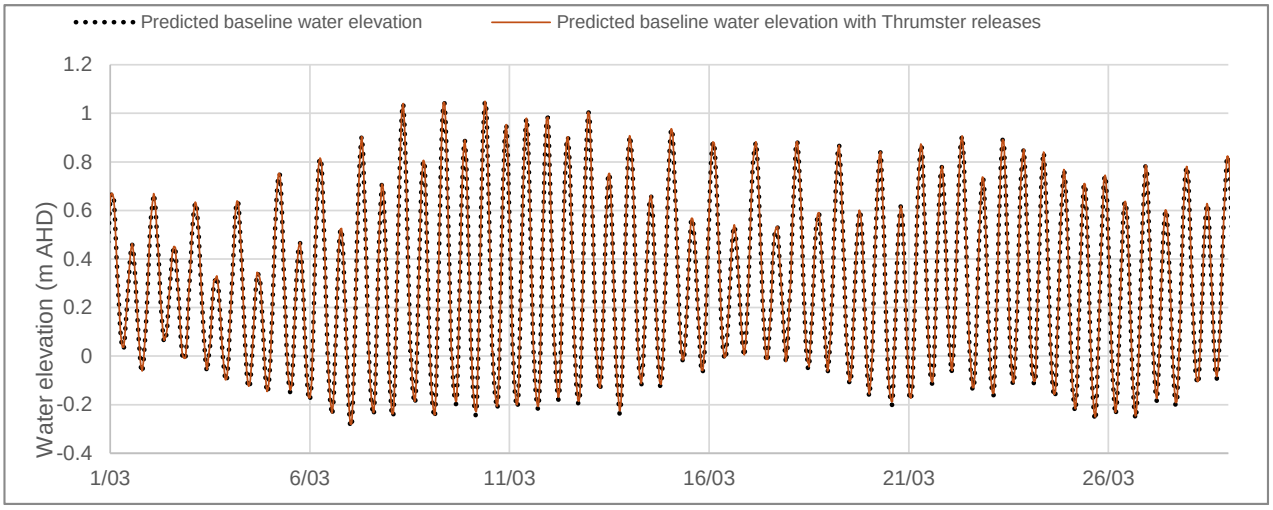

Figure 2-8 Predicted water elevations at Gordon Street bridge for background conditions (circa 2058) and with addition of the Thrumster releases

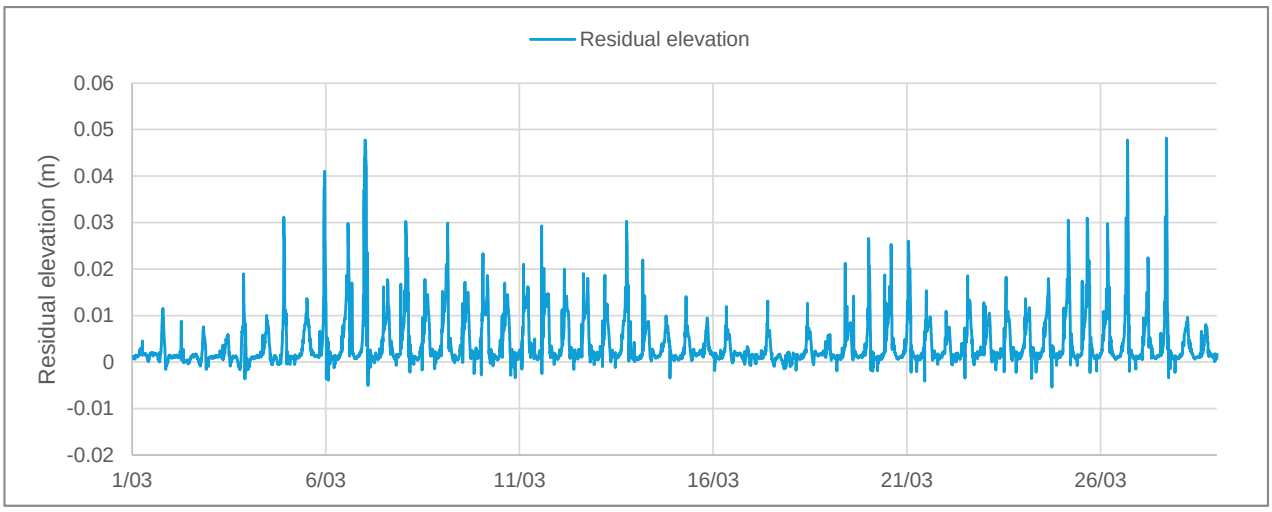

Figure 2-9 Predicted residual water elevations at Gordon Street bridge relative to baseline conditions (circa 2023/24)

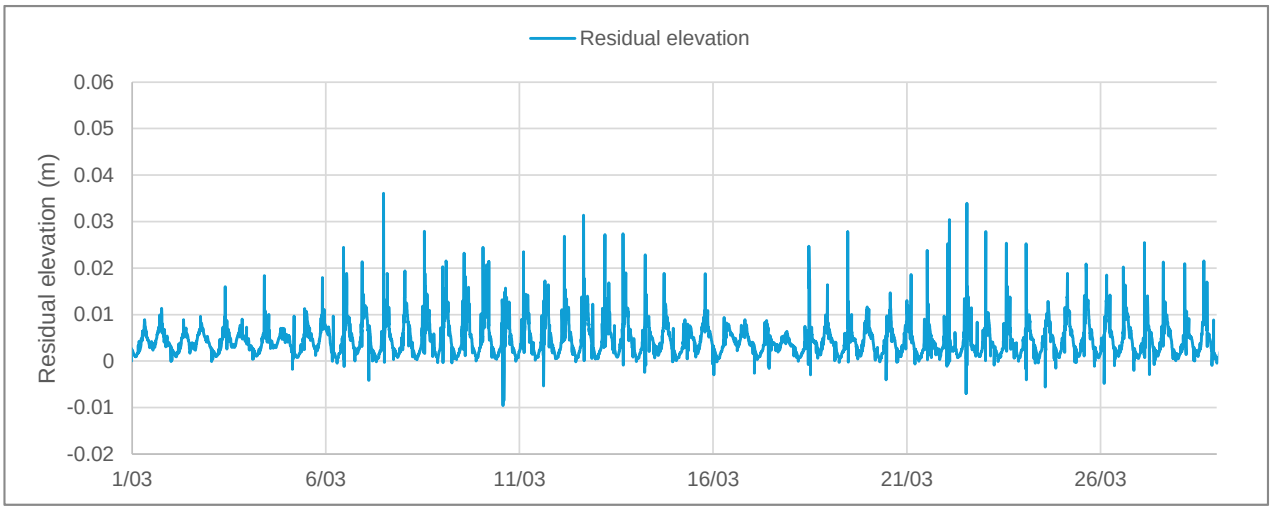

Figure 2-10 Predicted residual water elevations at Gordon Street bridge relative to background conditions (circa 2058)

2.3 Interpretation

From the model results, a prevailing semi-diurnal tidal pattern is clearly observed. As a result of the assumed sea level rise, an increase in flows within the creek is predicted under the 2058 scenario conditions relative to those assumed for the 2023/24 time horizon.

For the baseline circa 2023/24 scenarios, an average peak flow of ~2.6 m^3/s was predicted near the Gordon Street bridge, along with the following general ranges in peak tidal flows:

- Neap tides: 0.5 to 2 m^3/s
- Spring tides: 3 to 6 m^3/s

For the background circa 2058 scenarios, an average peak flow of ~4.3 m^3/s was predicted near the bridge, along with the following general ranges in peak tidal flows:

- Neap tides: 1 to 4 m^3/s
- Spring tides: 5 to 9 m^3/s

The results indicate there is generally limited influence from the Thrumster WWTP releases on the flow regime predicted in the vicinity of the Gordon Street bridge. While residual flows due to the addition of the Thrumster WWTP releases vary within and across tidal cycles, the average residual flow at the bridge is predicted to be 0.103 and 0.105 m^3/s relative to the baseline and background scenarios respectively. This correlates with the ADWF release volume from the Thrumster WWTP of 9.2 ML/d (~0.106 m^3/s).

Analysis of the estimated average volumes per tide at the bridge indicates an increase of approximately 1 ML per tidal cycle. This represents an increase in predicted tidal volume of ~1.5% and ~0.9% for the 2023/24 and 2056 time horizons respectively.

The predicted water elevations also indicate a relatively limited impact on water levels in the vicinity of the Gordon Street bridge. The maximum level of increase in water level due to the introduction of the Thrumster WWTP releases was predicted to be below 5 cm under the 2023/34 scenario, and under 4 cm for the 2058 scenario. The average predicted increase was however below 0.5 cm for both sets of scenarios.

3 Assumptions and limitations

The hydrodynamic modelling has been undertaken in line with accepted industry standard practices. However, in line with all similar impact assessment studies, the modelling undertaken for the EIS assessment should be considered as a representative approximation to the real world and not without accepted levels of uncertainty. It should therefore be understood that each model is based on a series of assumptions, and also dependent on the accuracy of its input data. The model results should therefore be interpreted as indicative of impacts, responses and trends in the receiving waters and not absolutes. Further discussion regarding relevant assumptions, limitations and levels of uncertainty is provided in the Water Quality Impact Assessment (Intrawater, 2024).

In relation to the findings of the hydrodynamic analysis presented in this technical note, the accuracy of the assessment results will be dependent on the resolution of the model mesh and accuracy of the underlying bathymetry data. It is noted that both these components are derived from relatively limited datasets including the Hastings River flood model, LiDAR data, boating chart data and spot levels provided by PMHC.

It is also noted that the analysis has been undertaken for predominantly dry periods. Under rainfall events, the volumes of treated wastewater released and the levels of runoff from the surrounding catchments will be expected to increase and influence the hydrodynamics and relative influence of the Thrumster releases. The potential differences in rainfall distribution between the Kooloonbung Creek catchment and the Thrumster WWTP sewerage catchment may also influence the relative contributions to flows in the creek.

C-2 Aquatic Ecology

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18 February 2025

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Re: Response to Submissions on Thrumster Wastewater Scheme

1. Background

H2O Consulting Group prepared a Technical Report - Aquatic Ecology Assessment dated 26 July 2024 as part of the Environmental Impact Statement (EIS) for the Thrumster Wastewater Scheme (TWWS) in Port Macquarie, NSW. The EIS has since been submitted and exhibited. This letter addresses issues raised by the Department of Planning, Housing and Infrastructure (DPHI) and joint responses from the Biodiversity, Conservation and Science Group (BCS) of the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) and the National Parks and Wildlife Service (NPWS).

2. Response to Relevant Comments from DPHI

a. The wave and current regimes are not clearly addressed with regards to aquatic ecology. Provide additional information outlining wave and current in relation to impacts on aquatic ecology.

Additional modelling has been performed by Intrawater using the previously prepared Water Quality Response Model (WQRM) (Intrawater 2024a). A typical tidal cycle was simulated over four weeks during March 2016 to analyse contributions from the Wastewater Treatment Plant (WWTP) and tidal influences under baseline (circa 2023/24) and background (circa 2058) scenarios, focused around the Gordon Street Bridge in Kooloonbung Creek, approximately 1,600 m downstream of the discharge outlet.

The results indicated:

- Average tidal flow volumes per tide at Gordon Street Bridge with releases from the proposed Thrumster WWTP is predicted to result in an increase of 0.9 ML (~1.5%) for baseline scenarios and 1.0 ML (~0.9%) for background scenarios.
- The average additional peak flow is predicted to be +0.103 m^3/s under baseline scenarios and +0.105 m^3/s under background scenarios.
    - The existing average peak flow without Thrumster releases were predicted to be 2.6 m^3/s for baseline scenarios (varying between 0.5-2 m^3/s during neap tides and 3-6 m^3/s during spring tides).
    - The existing average peak flow without Thrumster releases were predicted to be 4.3 m^3/s for background scenarios (varying between 1-4 m^3/s during neap tides and 5-9 m^3/s during spring tides).
- Average increase in depth at the Gordon Street Bridge, which has a typical daily tidal variation of 1.2m, from releases from the proposed Thrumster WWTP is predicted to be ~5 mm for both baseline and background scenarios. The maximum increase in depth for baseline scenarios is predicted to be up to 50 mm and for background scenarios up to 40 mm.

The results from the additional modelling indicate that the Thrumster WWTP releases are expected to have a generally limited influence on the flow and current regime in Kooloonbung Creek, in vicinity of the Gordon Street Bridge.

Considering the minimal increases in average tidal flow volumes, additional peak flow and additional depth from the Thrumster WWTP releases, the minimal shifts in the current regime of Kooloonbung Creek are not expected to significantly impact on aquatic ecology. The timing and tidal flow volumes of water flowing through the lower Kooloonbung Creek is not predicted to significantly change, thus is not expected to detrimentally impact on the transport of sediments and nutrients or movement of biota in the creek. Additionally, changes will be limited to habitats within the tidal reaches of Kooloonbung Creek where estuarine biota are adapted to varying flow and water depths.

b. Outline how surrounding land uses may affect the aquatic environment.

Fernbank Creek, Thrumster and Port Macquarie and the wider Port Macquarie-Hastings region encompasses a diverse range of land uses including significant areas of environmental conservation and management, primary production, residential, commercial, industry, tourism, recreation, infrastructure and some National Parks and Nature Reserves. A number of these land uses have potential to place ongoing or intermittent stress on surrounding aquatic ecosystems.

Partridge and Fernbank Creeks

The site of the proposed WWTP along Patridge Creek, Patridge Creek itself and its associated wetlands, as well as adjoining areas to the north towards the Hastings River and to the east to the Port Macquarie Airport are Environmental Conservation/Management areas, which largely coincides with mapped Coastal Wetland Areas under the Hazards and Resilience SEPP 2021. Other land use adjoining and adjacent to the proposed WWTP site are primary production lots with cattle grazing, including unrestricted cattle access to Partridge Creek along the man-made connection with Fernbank Creek. Aquatic ecosystems in streams with cattle access can experience various detrimental impacts, the most prominent being elevated inorganic sediment and nutrient inputs, habitat alteration from physical disturbance, reduced oxygen concentration and increased water temperatures (Conroy et. al., 2016). It is likely that the man-made connection of Partridge to Fernbank Creek occasionally experiences increased organic loads and nutrient inputs from cattle manure, where it is deposited along creek banks, within the creek or transported after rain events (Conroy et. al., 2016). As these organic loads are decomposed, the aquatic environment may experience some localised decreases in oxygen levels, whilst increases in available nutrients may increase preferential conditions for algal blooms.

Low lying lands on the flood plains around Partridge and Fernbank Creeks have also been historically subject to construction of drainage channels to support grazing and agricultural usage. This has resulted in lowering of the water table and increased exposure to Potential Acid Sulphate Soils. Water that accumulates in the drains can be of poor quality due to elevated concentrations of potential contaminants e.g. nutrients and contain very low pH and dissolved oxygen. The low pH waters also have greater capacity to absorb any heavy metals from the soils, which can be toxic to fish and other aquatic life. These drains act as existing point sources of pollution into Partridge and Fernbank Creeks and Council has been actively managing since 2001 with the installation of a hydraulic gate to control water levels and flow.

Additionally, the Port Macquarie Airport lays approximately 900 m to the east of Partridge Creek. Runoff from airports and runways can typically include hydrocarbons, heavy metals, suspended solids, nutrients and other chemicals such as pesticides, fire-fighting foams or de-icing chemicals. Runoff from the Port

Macquarie Airport is directed through a series of bioretention swales and managed under a stormwater management plan, before flowing into a tributary of the Hastings River.

Land uses surrounding upstream tributaries of Partridge Creek predominantly consist of primary production, forestry and environmental management areas, with some general industrial and residential areas. Major roads cross a number of these tributaries, including the Pacific Highway, Fernbank Creek Road and Sancrox Drive. To facilitate this infrastructure streams have been disturbed by the construction of concrete lined culverts, with the natural drainage paths and natural flow regimes of many 1st and 2nd order streams likely to have been altered over time.

Kooloonbung Creek

Kooloonbung Creek upstream of Ocean Drive is protected under the Lake Innes Nature Reserve, whilst downstream reaches are classed as an Environmental Conservation/Management areas. Surrounding land includes residential, primary production, recreation and wastewater infrastructure, including the existing Port Macquarie Wastewater Treatment Plant (PMWWTP). As discussed in the Aquatic Ecological Assessment (AEA) Technical Report (H2O Consulting Group 2024), Kooloonbung Creek currently receives treated effluent discharge from the PMWWTP (at a volumetric limit of 37.4 ML/Day), whilst an overflow drain discharging balance tank, inlet works and an overflow weir discharge to Cattle Brook Creek and thereafter to Kooloonbung Creek (confluence of Cattle Brook Creek is ~300 m upstream of discharge outlet). Water quality of these discharges from the past eight years are summarised in Appendix 3. At times the PMWWTP results in pulse disturbances to the water quality of Kooloonbung Creek, predominantly associated with elevated pH, elevated ammonia concentrations, elevated nitrogen levels and elevated total suspended solids.

Upstream areas of Kooloonbung Creek are contained within the Lake Innes Nature Reserve, however, still receive stormwater runoff from surrounding residential areas. Downstream of the proposed discharge outlet, land use includes Environmental Conservation/Management areas along the creek, bordered by high density residential, commercial and local centres and public recreation areas. Stormwater runoff from these areas likely contribute some nutrients, toxicants (including hydrocarbons from fuel) and debris to downstream receiving wates of Kooloonbung Creek, following rainfall events.

c. The photos provided in Technical Report 6 are not at high and low tide as per the SEARs. Please update as required.

Survey sites investigated in the AEA (H2O Consulting Group 2024) included seven sites within the tidal limit of Kooloonbung Creek (K01-K07) and one site at the estimated tidal limit of the Partridge/Fernbank Creek man-made connection (K08). Other sites at Partridge Creek are freshwater habitats above the tidal limit and not affected by tides (P09-P12). Photos facing upstream and downstream at high and low tide at the 8 sites noted are provided in Appendix 1.

d. The cumulative impacts to aquatic ecology do not appear to have been adequately addressed. Aquatic ecology is not specifically addressed within Section 24 of the EIS and other developments and cumulative impacts are not addressed within the aquatic ecology assessments.

This response should be read in conjunction with 4a (ii) – Response to relevant comments from NPWS, which addresses cumulative impacts associated with Kooloonbung Creek.

Impacts to Water Quality – Overflow Events in Partridge and Fernbank Creek

Impacts to Partridge and Fernbank Creek are not expected to occur during the normal operation of the WWTP and are expected to be limited to pulse events of storm storage pond overflow, associated with extreme and prolonged rainfall events. During high rainfall periods, excess storm flows will be stored in a 25 ML storm storage pond and returned to the WWTP for full treatment once flow inputs reduce, however, in the case of prolonged and high-volume rainfall events, overflow from the storm storage pond will be conveyed by constructed swales to Partridge Creek upstream of the existing hydraulic gate. Modelling that considered the capacity of the storm storage pond concluded that overflow events are only likely to occur during rainfall events of 400 and 500 mm over 8 to 9 consecutive days. The typical water quality expected during these overflows is detailed in Table 1 (Intrawater 2024b).

Table 1: Assumed wastewater quality for Thrumster WWTP storm storage pond overflow releases (Intrawater 2024b).

Parameter	Partridge Creek releases
Total Nitrogen (mg/L)	7.1 – 12.7
Ammonia (mg/L)	5.4 – 9.6
Oxidised Nitrogen (mg/L)	0.0 – 0.2
Organic Nitrogen (mg/L)	1.7 – 3.1
Total Phosphorus (mg/L)	1.25 – 2.25
Filterable Reactive Phosphorus (mg/L)	0.90 – 1.50
Organic Phosphorus (mg/L)	0.35 – 0.65
Organic Carbon (mg/L)	23 – 42
pH	6.5 – 8.5
Biochemical Oxygen Demand (mg/L)	40 – 70
Dissolved Oxygen (mg/L)	5.0 – 5.2
Enterococci (cfu/100mL)	30,000 – 50,000

The ranges presented for the Partridge Creek releases relate to minimum and maximum concentrations predicted from retention in the storm storage pond, the minimum equating to higher dilution, the maximum to lower dilution (Intrawater 2024b).

The Hastings River and the lower floodplain are historically prone to flooding, with a 1-in-100 Annual Exceedance Probability (AEP) experienced in March 2021, an additional flood event in November 2021 and two in 2022. Flood waters typically contain a range of contaminants, transported as urban, agricultural and industrial areas are flooded. Contaminants may include waste, chemicals, hydrocarbons, pesticides and debris with high levels of nutrients, bacteria and toxicants, whilst suspended solids also significantly increase. Overflows from sewage and septic tanks can also contribute to reduced water quality. Modelling of the overflow releases from the storm storage pond indicated that overflow would contribute to elevated concentrations of nutrients and pathogens in Partridge and Fernbank Creek during bypass events, including (Intrawater 2024b):

- Total Nitrogen: ~0.37 mg/L increase relative to background conditions,
- Inorganic Nitrogen: ~0.30 mg/L increase relative to background conditions,
- Total Phosphorus: ~0.07 mg/L increase relative to background conditions,
- Inorganic Phosphorus: ~0.05 mg/L increase relative to background conditions; and
- Enterococci: ~750 cfu/100 mL increase relative to background conditions.

Considering the significantly increased flushing and flow that would be associated with such rainfall events, modelling also indicated that the elevated concentrations of the above parameters would return to background levels shortly following cessation of releases, with impacts to water quality expected to be immeasurable once flows reach the Hastings River (Intrawater 2024b). Nevertheless, overflows are expected to further contribute to elevated nutrient and pathogen levels in Partridge and Fernbank Creeks in addition to that of flooding/high rainfall events. Topography in the vicinity of the proposed WWTP is relatively flat, with land and wetlands surrounding Partridge Creek and Fernbank Creek typically between 1-

3 m AHD. Whilst constructed swales are anticipated to direct overflow towards Partridge Creek, the creeks and swales may already be at capacity from environmental flows or flooding by the time overflow is released, thus overflow may instead disperse across the adjoining wetland habitat.

Wetlands facilitate nutrient cycling through a combination of physical, chemical and biological processes such as biomass accumulation, denitrification, deposition, absorption/desorption, fixation, mineralisation, sedimentation and food chain transfer (DESIQ 2021). As these ecosystems are highly efficient at cycling nutrients, both natural and constructed wetlands have widely been used as part of wastewater treatment. As discussed in the AEA (H2O Consulting Group 2024), excessive inputs of limiting nutrients (predominantly nitrogen and phosphorus) to freshwater habitats can promote growth of algae and detrimentally impact on water quality. Where overflow and flood waters pool in freshwater areas of the creek without tidal exchange or in low lying areas on the floodplain, aquatic habitats may receive inputs with highly concentrated nutrients loads.

Changing climate patterns are leading to shifts in hydrological cycles and biogeochemical cycles, with freshwater wetlands vulnerable to a range of variables associated with climate change. These are predicted to include a decline in winter and spring rainfall, an increase in extreme rainfall, an increase in evaporation and sea level rise and saltwater inundation (DCCEWW 2024). Changes in wetland functioning and the efficiency of ecological processes in wetlands in response to climate change may alter their efficacy as buffer environments over time, which in turn could exacerbate long-term pressures on water quality.

Other Developments

Projected development in the Port Macquarie-Hastings region over the next 25 years (by 2058) includes an expected new urban area of 5.04 km^2 in the Fernbank catchment and 17.35 km^2 in the Kooloonbung catchment. Development in surrounding catchment including the Haydons, Hibbard, King, Mortons, Pembrooke and Yippin catchments are expected to equate to new urban areas of approximately 17.92 km^2 (Intrawater 2024b). Urban development in the region over the next 25 years may place increased stress on aquatic habitats in these catchments. The physical ongoing construction works will likely result in disturbances to tributaries of the Hastings River catchment and may include disturbances such as habitat damage, erosion, sedimentation or destruction of riparian corridors. The increased area of urban land use will increase non-permeable areas, with additional potential for increased loads of urban and industrial runoff, nutrients, toxicants, debris and dissolved solids. New stormwater networks will be required as part of these developments, which will increase discharges and transport of these contaminants to local waterways, which may include Partridge and Kooloonbung Creek and their tributaries as well as other sub-catchments of the Hastings River. Changes in land use and decreased permeability may also change hydrology of the local catchments as flow inputs during rain events are altered by shifts in areas with soil absorption capacity. The TWWS has been designed to accommodate for the wastewater expected to be produced as a result of these projected developments, however, it is likely that catchments will experience increased pressures over time and may experience a general decrease in water quality from increased catchment runoff.

Other current major developments in the surrounding area with potential to contribute to cumulative impacts include the following:

- Proposed Cowarra Water Supply Scheme (SSI-57056461) – proposed pipeline running from Cowarra, through Thrumster and to Port Macquarie. Project is under assessment with construction likely to overlap with the Thrumster Wastewater Scheme.

- Proposed Gordon Street Port Macquarie Affordable Housing (SSD-71373460) – at Gordon Street, in town at Port Macquarie close to the mouth of the Hastings River. Project is in progress of EIS preparation and not expected to overlap in footprint with the Thrumster Wastewater Scheme. Proposed project will involve construction of a residential flat building with approximately 94 new dwellings.
- Proposed Rosewood Eco Park (SSD-64492477) – at Rosewood, Port Macquarie. Project is in progress of EIS preparation and is expected to be confined to existing quarry site; unlikely to overlap with the Thrumster Wastewater Scheme.
- Proposed Sancrox Quarry Expansion Project (SSD-7293) - at Sancrox, Port Macquarie. Nature of the proposal is confined to the quarry and not expected to overlap proposed Thrumster Wastewater Scheme.
- Hastings Secondary College Port Macquarie Campus Upgrade (SSD11920082) – at Owen Street, Port Macquarie. Works are mostly complete, with no potential for overlap.
- Port Macquarie Health and Education Precinct (SSD-19888478) - area bounded by John Oxley Drive to the west, Lake Road to the north, the industrial area and Lake Innes Nature Reserve to the east, and the southern boundary of St Columba Anglican School, Port Macquarie. Works are complete for this project.
- Cairncross Waste Management Facility Expansion (SSD-5792) – at Telegraph Point Road, Pembrooke. Works are complete for this project.
- John Oxley Drive Upgrade (Port Macquarie Hastings Council) – at John Oxley Drive between Kingfisher Road and The Ruins Way. Depending on assessment and design approvals, construction works may occur concurrently with the proposed Thrumster Wastewater Scheme, however, are not expected to overlap in footprint.

The proposed Cowarra Water Supply Scheme (CWSS) and the TWWS pipeline routes both cross headwaters of Partridge Creek and of an unnamed tributary of the Hastings River that runs through the Port Macquarie Airport. The sections of the TWWS pipeline that will transverse Partridge Creek and its associated wetlands are proposed to be constructed using HDD, with open trenching expected at the top end of one 1st order tributary upstream. The CWSS is expected to result in open trenching of seven 1st or 2nd order tributaries and HDD of three 1st or 2nd order tributaries of Partridge Creek. Similarly, multiple sections of the unnamed Hastings River tributary will be trenched by both projects. Both projects are required to prepare and implement appropriate Sediment and Erosion Management Plans (SEMP), however, the trenching and bunding of multiple tributaries of the same system at once increases the risk of water quality impacts. Where sedimentation and increased turbidity does occur as a result of works in multiple tributaries, environmental effects may become accumulative in downstream areas where higher volumes of sediment are deposited, which may lead to smothering of aquatic flora and fauna. This may be exacerbated if multiple tributaries are also bunded at the same time, reducing the flow into the main creek to dissipate sedimentation effects. Considering the distance between tributaries and the proposed project delivery timing, it is not expected that multiple tributaries will be trenched and bunded at the same time that may lead to the above impacts. Thus, cumulative water quality impacts with potential to affect aquatic habitat quality as a result of the two projects are considered unlikely.

Additionally, maintenance dredging of the lower Hastings River may be periodically undertaken to maintain the navigational channel, which may include an area of the seabed at the confluence of Kooloonbung Creek. Dredging is likely to result in temporary, pulse reductions in water quality in the vicinity of dredging works, however, would not be expected to significantly impact on water quality within Kooloonbung Creek.

e. **Are any offsets proposed to be applied? Provide information about how offsets may be proposed to be applied.**

An updated Project Area with altered footprint for the Thrumster WWTP and pipeline was provided by Port Macquarie-Hastings Council (PMHC) following the EIS Submission (see Appendix 2 – Figure 1). The updated Project Area reduces the amount of KFH that will be directly and indirectly impacted by the proposed scheme, with new areas shown in Table 2. This includes a modification of the proposed compound/laydown area at the Thrumster WWTP site to predominantly avoid the mapped Coastal Wetlands along Partridge Creek. Adjustments in the pipeline alignment also now avoids some sections of Type 1 KFH (as mapped Coastal Wetlands) and Type 3 KFH along the RTEP, SRM and RWM to the east of the Airport adjacent to Boundary Street and the RTEP, SRM and RWM in two small areas north of the Port Macquarie Racecourse.

Table 2: Updated approximate direct and indirect impacts to Key Fish Habitat as a result of construction works.

KFH Type	Approximate Direct Impact Area (m^2)	Potential Indirect Impact Area (m^2)
Type 1 KFH/Coastal Wetlands	13	4,535
Type 3 KFH	52	1,001

The remaining direct impacts to Type 1 and Type 3 KFH occur in a small pocket of KFH on the northern side of Port Macquarie Racecourse. As identified in the Aquatic Ecology Assessment (H2O Consulting Group 2024), habitat in this area was highly degraded, ephemeral and unlikely to provide permanent habitat for aquatic species, with species observed predominantly being terrestrial weeds. *In situ* verification during surveys would have attributed this Type 1 KFH as Type 3 KFH without it being mapped as a Coastal Wetlands Area. Considering the lack of habitat value this area provides and the lack of freshwater vegetation present, offsets for impacts to this area of Type 1 KFH are not required.

3. Response to Relevant Comments from BCS

a. **The project has the potential to cause a Serious and Irreversible Impact (SAII) on Giant Dragonfly and BCS recommends the proponent make further effort to avoid and minimise the impacts. We note that this issue has a simple resolution documented in Attachments B and C.**

The proposed TWWS Project Area has been amended to minimise the area of the proposed compound/laydown area at the Thrumster WWTP site to reduce impacts to the Type 1 KFH associated with the Partridge Creek Wetlands (see Appendix 2 – Figure 1), which contains potential Giant Dragonfly habitat. Indirect impacts are expected to occur to approximately 137 m^2 of the southern edge of the Partridge Creek wetlands.

4. Response to Relevant Comments from NPWS

a. **The EIS and Technical Reports 1A and 1B confirm there are potential operational impacts of the project relating to treated effluent discharged via the Treated Effluent Pipeline into existing drainage infrastructure at Kooloonbung Creek. A potential risk of toxicity is predicted at the Lake Road release point and within the upstream reaches of the creek, including within Lake Innes Nature Reserve, which may impact highly sensitive Key Fish Habitat and the Coastal Wetlands mapped under the SEPP (Resilience and Hazards). NPWS is concerned around the operational risk of the scheme with regards to increased flows into Kooloonbung Creek that may occur in the event of asset failure. NPWS recommended actions:**

Revising the EIS, and all relevant technical reports, to identify and detail:

i. potential upstream impacts of the effluent discharge to Kooloonbung Creek, including any proposed mitigation strategies to protect water quality in Key Fish Habitats, Coastal Wetlands and Lake Innes Nature Reserve.

The water quality modelling detailed in Technical Report 1B (Intrawater 2024b) identified water quality impacts to occur up to 3.4 km upstream of Kooloonbung Creeks confluence with the Hastings River. Changes in water quality are generally confined to minor increases in total nitrogen and inorganic nitrogen. These changes are predicted to return to modelled baseline/background conditions within ~750 m upstream of the discharge outlet. Exceedances in ammonia and nitrate levels in accordance with a 95% Level of Species Protection are also predicted up to ~200 m upstream of the discharge point, referred to in the Technical Report 1B as the 'mixing zone'.

As discussed in the AEA (H2O Consulting Group 2024), upstream habitats (within ~750 m of outlet) where tidal flushing is more limited and where Sea Level Rise (SLR) may not sufficiently buffer increased nutrients from releases are likely to experience elevated risk of eutrophication. This may lead to reductions in ecological health and faunal diversity, growth of nuisance species and fish kills (refer to Section 5.2.1.2 of AEA). Where ammonia and nitrate levels exceed guidelines within the ~200 m upstream buffer for 95% Level of Species Protection, upstream habitats may experience reduced faunal diversity and pollution sensitive taxa, and greater prevalence of more resilient species (refer to Section 5.2.1.3 of AEA). It is expected that the ongoing tidal exchange in Kooloonbung Creek will provide sufficient flushing of nutrients before eutrophication process can commence, provided nutrient levels in effluent discharge stay within expected effluent quality concentrations. Also considered in the AEA (H2O Consulting Group 2024) was the potential for mangroves to uptake some of the nutrient loads discharged from effluent releases in both upstream and downstream areas. The mangrove limit extends between 180 – 200 m upstream of Lake Road, which is not expected to change with modelled conditions by 2058 and may act as an ecological buffer to more sensitive habitats upstream. Potential impacts to estuarine vegetation in the Kooloonbung Creek wetlands have been discussed in Section 5.2.4 of the AEA.

The tidal limit in Kooloonbung Creek is ~900 m upstream of Lake Road, which is ~1,050 m upstream of the discharge outlet and sits on the most northern boundary of the Lake Innes Nature Reserve. It is possible that impacts to water quality may extend upstream to this extent, beyond the modelled impact distance, however, impacts to Kooloonbung Creek further upstream than the tidal limit would be considered unlikely given the lack of any tidal exchange. The exception would be during flood or high rainfall events where water levels are elevated, and some increased mixing may occur. However, considering that the catchment would be draining towards the Hastings River and increased water volumes may provide increased dilution of nutrients, impacts to water quality in upstream areas of Kooloonbung Creek specifically from releases would be considered relatively minor in these instances.

A Water Quality Monitoring Program and various Ecological Monitoring Programs (relevant to upstream habitat included Riparian and Shoreline Assessment and Infauna Assessment) have been recommended in the AEA (H2O Consulting Group 2024) to monitor and protect water quality, KFH, wetlands and general surrounding aquatic habitat. This included the establishment of monitoring sites both upstream and downstream of the discharge and the establishment of site-specific trigger values that could trigger review of effluent water quality and processes if exceeded during operation (refer to Section 6.2 of AEA). The implementation of these recommendations will be important in allowing adaptive management to manage any potential upstream impacts of the effluent discharge to Kooloonbung Creek.

ii. **operational risks of the scheme, and specifically the Treated Effluent Pipeline, with an assessment around the likelihood of asset failure and emergency intervention measures, with a consideration of how this will potentially affect Kooloonbung Creek and upstream flows into Lake Innes Nature Reserve.**

An assessment of the potential operational risks of the Thrumster Wastewater Scheme associated with the treatment plant and discharge outlet/discharges in respect to ecological water quality and flow (salinity, nutrients, toxicants, dissolved oxygen, biological oxygen demand, altered flow regimes and marine debris), key fish habitat and coastal wetlands, riparian condition, aquatic macrophytes and aquatic fauna, including threatened species, was considered in the AEA (H2O Consulting Group 2024). Operational risks of the proposed Thrumster WWTP will also be addressed in an operational management plan for the project. It is expected that the risk of asset failure will be greatly reduced as the PMHC's wastewater network is modernised as part of the proposed scheme. Should asset failure occur along the Treated Effluent Pipeline, the release rates and mass loading would not be expected to change at Kooloonbung Creek, as discharge rates will be governed by the proposed treatment plant at Thrumster. Should asset failure occur, the operational management plan is expected to include capacity and procedures for treated effluent to be temporarily stored in the proposed storm overflow storage pond until the asset is repaired.

The Treated Effluent Pipeline does hold potential operational risks throughout the lifetime of the scheme. As various assets (including the return treated effluent pipeline (RTEP), sewer rising main (SRM), pumping stations and supporting infrastructure) age or other works disturb these assets, asset failure may result in pipe bursts or leaking of treated effluent and untreated sewage/wastewater into aquatic habitats along the pipeline route. This has potential to result in pulses disturbances of discharges containing high nutrient loads, high organic loads or faecal concentrations. Near to the WWTP at Fernbank Creek, the RTEP and SRM is proposed to pass underneath Patridge Creek and its associated wetlands, installed via horizontal directional drilling (HDD) (GHD 2024). The RTEP and SRM are also proposed to cross two tributaries each and lay adjacent to a number of pockets of Coastal Wetland Areas mapped under the Hazards and Resilience SEPP (2021). The bursting or leaking of the RTEP and SRM has potential to result in the unplanned discharge of treated effluent and untreated sewage/wastewater, respectively, into adjacent aquatic environments.

Wastewater being pumped through the SRM is expected to include both domestic wastewater (including sewage, showers, kitchen, laundry etc) and industrial wastewater, which can contain high levels of organics and nutrients. In the event of asset failure of the SRM, unexpected discharges of untreated wastewater into or adjacent to aquatic habitats has potential to lead to sudden decreases in dissolved oxygen levels as organic matter (e.g. faecals or food waste) is decomposed (Wear et. al., 2021). These untreated discharges would also be expected to contain high concentrations of nitrogen (as organic nitrogen and ammonia) and phosphorus. As discussed in relation to operational impacts in the AEA (H2O Consulting Group 2024), increased nutrients in waterways can enhance aquatic plant and algae growth and biomass that in turn results in rapid levels of decay when this material breaks down, increasing the biological oxygen demand and depleting the waterway of oxygen (Clarke 2011). Considering that inputs of organic matter could potentially have two sources during an asset failure event of the SRM, the depletion of oxygen during decomposition processes may occur to the extent of hypoxic or anoxic conditions. This is particularly applicable in aquatic habitats along the SRM route that are ephemeral in nature and/or lack good connectivity with surrounding aquatic habitats, with less potential for flushing and the dilution of nutrients and organic matter. In these more ephemeral habitats aquatic fauna present at the time of asset failure will likely at a minimum experience reduced habitat quality, with potential for hypoxic or anoxic stress, which may result in mortality for some species. In more semi-permanent or permanent habitats such as the wetlands associated with Partridge Creek, aquatic fauna may experience temporary reduced habitat quality

and hypoxic stress at the source of asset failure and would likely, where possible, disperse from the disturbance. Wastewater can also contain a complex mixture of chemicals such as metals, polycyclic aromatic hydrocarbons (PAHs), pesticides and volatile organic compounds, which in high concentrations can be toxic to aquatic life. The severity of impacts on aquatic ecosystems along the SRM route will be determined by the magnitude of asset failure (small leak vs complete burst), the emergency intervention time and the current flow conditions of the system (dry vs recent rainfall). At the least this will amount to short-term habitat disturbances, with potential to amount to fish/invertebrate kills in more extreme cases.

The RTEP will transport effluent that has undergone treatment at the Thrumster WWTP to the discharge point within Kooloonbung Creek. The treated effluent is expected to meet water quality objectives as set out in the EIS Technical Report 1B (Intrawater 2024b), however, is still expected to contain elevated concentrations of nutrients and potential toxicants (ammonia and nitrate), compared to ANZECC Guidelines (2000). In the case of asset failure of the RTEP, whilst effluent will be treated, water with elevated nutrients may still have potential to result in eutrophication of waterways, potential algal blooms and associated depletions in oxygen levels. Additionally, ammonia and nitrate present in effluent may result in the toxification of aquatic habitats where adequate aquatic environment is not available to facilitate dilution or flushing and particularly where pH is more alkaline (H2O Consulting Group 2024). Impacts of ammonia and nitrate toxicity on aquatic fauna is detailed in Section 5.2.1.3 of the AEA (H2O Consulting Group 2024). As identified above, these impacts of asset failure may be magnified in habitats along the RTEP route that are more ephemeral and have less opportunity for flushing or dilution, or for fauna to disperse. The RTEP traverses one 1st order tributary that drains into the upstream section of Kooloonbung Creek within the Lake Innes Nature Reserve. This tributary is a small drainage line and receives inputs from the industrial area to the north of Lake Road, before draining into Kooloonbung Creek just upstream of the tidal limit (~500 m). If an asset failure were to occur in the vicinity of this tributary, treated effluent would be released into the tributary and thereafter into Kooloonbung Creek, approximately 1.4 km upstream of the proposed discharge outlet. As the confluence of the tributary is above the tidal limit, flushing would be reliant on upstream flow.

There is potential that an asset failure in this location could compound water quality impacts in the vicinity of the discharge outlet in Kooloonbung Creek. Effluent with potential for elevated nutrients and elevated toxicants would be discharging from the failed asset, Thrumster WWTP outlet and the Port Macquarie WWTP outlet, whilst the 1st order tributary may also include some nutrients and toxicants from the industrial area. This may result in localised eutrophication and create favourable conditions for an algal bloom, resulting in depletion of oxygen levels. Ammonia is more toxic under low oxygen concentrations, whilst it is also more toxic under higher temperatures and alkaline pH levels, with treated effluent expected to have a pH of 6.5-8.5. In a worst-case scenario where an asset failure occurs, the compounding inputs and associated impacts could result in a temporary dead zone of high toxicity between in the vicinity of discharge outlets and the 1st order tributary. However, the severity and magnitude of this would be highly variable and affected by a complex interaction of factors including, but not limited to: volume of failure discharges, volume of Thrumster and Port Macquarie WWTP discharges of that day, ambient creek conditions (temperature, pH, dissolved oxygen, nutrients), creek flow, recent rainfall (considering both flow and transport of nutrients/toxicants from stormwater), tide, amount of detritus in the creek, emergency response time, and levels of nitrogen, phosphorus and ammonia in effluent at the time.

Unexpected treated effluent or sewerage discharges would be expected to have lesser impacts in the Partridge Creek wetlands compared to other aquatic habitats along the pipeline routes. Natural and constructed wetlands, particularly with emergent macrophytes, have been utilised for wastewater treatment globally for decades. Impacts to these wetlands in the event of asset failure would likely be similar to those identified throughout Section 5.2 of the AEA (H2O Consulting Group 2024) in the event of episodic overflows. However, as flood waters may not be present to dilute and flush the effluent from the wetlands,

the likelihood of algal blooms, ecotoxicity and decreased dissolved oxygen would be increased, with the magnitude of impact dependent on ambient water levels in the wetlands and recent weather patterns.

The operational management plan should include a strong operational maintenance schedule with suitable frequency of asset inspections over the scheme lifespan to prevent the likelihood of asset failure along with regular water quality monitoring that includes sampling of relevant ecological indicators.

iii. the cumulative impacts of the proposal, as this project will significantly increase the amount of treated effluent already discharged into the creek.

The design flows and hydraulic contributions for the proposed Thrumster WWTP have been calculated in the EIS, with the expected commissioning Average Dry Weather Flow expected to be 6 ML/Day, increasing to 9.2 ML/Day at Stage 1 and 18.4 ML/Day at Stage 2 (GHD 2024). Kooloonbung Creek currently receives treated effluent discharge from the PMWWTP (at a volumetric limit of 37.4 ML/Day), whilst an overflow drain discharging balance tank, inlet works and an overflow weir discharge to Cattle Brook Creek and thereafter to Kooloonbung Creek. Annual data from Environmental Compliance Reports for the Port Macquarie Wastewater Treatment Plant from 2021 to 2024, showed that average daily effluent flow ranged between ~15.6 ML/Day to 21.3 ML/Day across the last four years.

The below sections address potential cumulative impacts of the proposal in Kooloonbung Creek, particularly in reference to cumulative water quality impacts that may affect aquatic fauna or flora. The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000 and ANZG 2018) are referenced in these sections to provide some context to potential ecological stressors. It is noted that the guideline values should be applied to the receiving environment at the edge of a mixing zone and are not designed to apply to the point of discharges (GHD 2024). However, the mixing zone in Kooloonbung Creek for toxicants of concern is estimated to extend a total of 1 km (for 95% Level of Species Protection) and will extend across the entire width of the waterway. As this may pose potential chemical and/or environmental barriers to fish passage between freshwater and estuarine/marine habitats, it is important that trigger or guideline values are still given consideration within this zone.

<u>Ammonia</u>

Existing data from Port Macquarie Wastewater Treatment Plant Environmental Compliance Reports from 2017-2024 shows that average ammonia concentrations in PMWWTP discharges ranged between 0.7-1.59 mg/L. Maximum concentrations varied between years, with the highest concentrations recorded at 20.1 mg/L (2017-2019), 8.83 mg/L (2023) and 6.7 mg/L (2024). Trigger values for ammonia are calculated based on different pH values, as pH affects the toxicity of ammonia. The average pH values for the PMWWTP discharges from 2017-2019 ranged between 7.3-7.8, with the highest values recorded at 9.3 (2017-2019), 8.6 (2023) and 8.4 (2024). At a pH of 7.5, the freshwater trigger value for ammonia is 1.61 mg/L and the marine trigger value is 2.15 mg/L (ANZG 2018). Thus, average pH values of the PMWWTP discharges from 2017-2024 have typically been within the trigger values for both freshwater and marine habitats considering an average pH of 7.5. However, when considering individual measurements, the discharge exceeds these trigger values numerous times throughout each year. Ammonia is a non-persistent and non-cumulative toxicant to aquatic life (ANZG 2018). The Thrumster WWTP discharges will contribute another source of ammonia to Kooloonbung Creek, which will increase the total load of ammonia, however, may not necessarily increase the concentration of ammonia as the added discharge provides more water for dilution. Even without a significant increase in concentration, increased loads of ammonia have potential to result in greater toxicity under certain conditions (temperature and pH). When considered with the existing PMWWTP, the addition of the TWWTP discharges to Kooloonbung Creek increases the likelihood that ammonia ecotoxicity may occur within the mixing zone. There is potential that

at times over the operation of both treatment plants, both discharges may have elevated levels of ammonia as well as more alkaline pH levels, resulting in pulse disturbances with spikes in ammonia concentration that could significantly exceed trigger values for freshwater and marine species. As ammonia is non-cumulative, these disturbances would likely be temporary until ammonia concentrations in discharges decrease or the effluent is flushed/diluted, with magnitude affected by ambient environmental conditions. A higher ammonia load also means that over time organisms in Kooloonbung Creek (likely predominantly limited to within the mixing zone) could be exposed to a steady or sustained level of ammonia, where even if concentrations remain low, chronic exposure could be harmful for sensitive species. The potential impacts of high and/or toxic levels of ammonia on aquatic fauna as a result of the additional Thrumster discharges is discussed in Section 5.2.1.3 the AEA, which also details the potential that chronic low ammonia levels from the combined inputs may result in reduced diversity, dominated by more resilient species (H2O Consulting Group 2024).

Nitrogen and Phosphorus

Existing data from Port Macquarie Wastewater Treatment Plant Environmental Compliance Reports from 2017-2024 shows that average Total Nitrogen (TN) concentrations from existing PMWWTP discharges ranged from 3.67-5.29 mg/L whilst average Total Phosphorus (TP) concentrations ranged from 0.27-0.41 mg/L. Both maximum TN and TP concentration peaked during 2017-2019 at 24.9 mg/L and 2.44 mg/L. The existing PMWWTP discharges contain elevated levels of TN and TP that are well above the ANZECC Guidelines (2000); the TN lowland river trigger value is 0.5 mg/L and marine trigger value is 0.12 mg/L and the TP lowland river trigger value is 0.05 mg/L and marine trigger value is 0.025 mg/L. As with ammonia, the Thrumster WWTP discharges will increase the total load of TN and TP, however, may not necessarily increase the concentration, with increased dilution. Both nitrogen and phosphorus are limiting nutrients for aquatic flora and as has been discussed in other responses and in Section 5.2.1.2 of the AEA (H2O Consulting Group 2024), there is potential that the addition of the Thrumster discharges may result in an over-enrichment of nutrients within Kooloonbung Creek, leading to eutrophication. The potential cascade impacts of eutrophication have been discussed in detail in Sections 5.2.1.2 and 5.2.1.4 of the AEA, which in summary include an increased risk of excessive algal growth, rapid increases in Biological Oxygen Demand, rapid decreases in Dissolved Oxygen, reductions in ecological health, reductions in faunal diversity, fish kills, chemical barriers to fish passage and areas of hypoxic or anoxic waters. It is generally expected that as the discharge outlets are within the tidal limit of the creek, tidal flushing and the dilution of nutrients from the discharge waters will provide sufficient mixing before eutrophication occurs. Risks of eutrophication are increased particularly in instances where effluent from both plants exceed effluent quality concentrations and guidelines concurrently.

It should also be noted that whilst immediate eutrophication events may be generally unlikely based on modelling, both nitrogen and phosphorus can accumulate. Ongoing loading of nitrogen and phosphorus in Kooloonbung Creek over years of operation may eventually lead to nutrient saturation or high ambient nutrient loads that trigger algae blooms when the right environmental conditions occur. Additionally, a projected development area of 17.35 km^2 in the Kooloonbung Creek catchment over the next 25 years will likely contribute further sources of nitrogen and phosphorus to the creek.

Sincerely,

Author	Reviewer
Alex Swanson, Lead Aquatic Ecologist	Dr David Cummings, Principal Aquatic Ecologist

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Appendix 1

Plate 1: a) Site K01 facing upstream of Kooloonbung Creek, b) Site K01 facing downstream of Kooloonbung Creek at High Tide and Low Tide.

HIGH TIDE

LOW TIDE

Plate 2: a) Site K02 facing upstream of Kooloonbung Creek, b) Site K02 facing downstream of Kooloonbung Creek at High Tide and Low Tide.

HIGH TIDE

LOW TIDE

Plate 3: a) Site K03 facing upstream of Kooloonbung Creek, b) Site K03 facing downstream of Kooloonbung Creek at High Tide and Low Tide.

HIGH TIDE

LOW TIDE

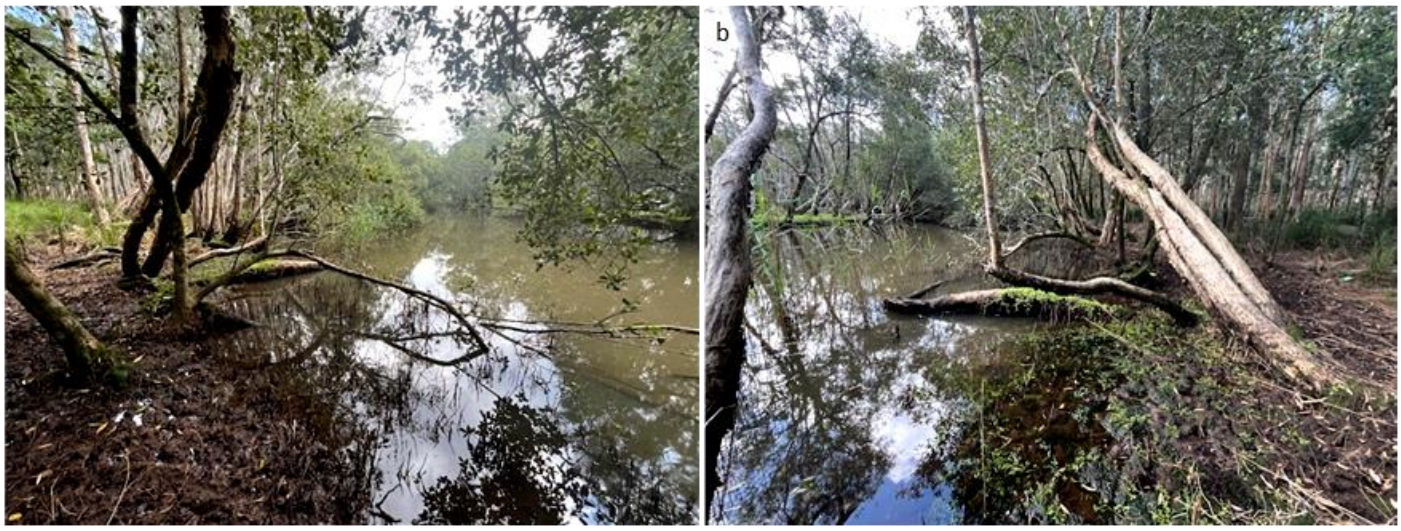


Plate 4: a) Site K04 facing upstream of Kooloonbung Creek, b) Site K04 facing downstream of Kooloonbung Creek at High Tide and Low Tide.

HIGH TIDE

LOW TIDE

Plate 5: a) Site K05 facing upstream of Kooloonbung Creek, b) Site K05 facing downstream of Kooloonbung Creek at High Tide and Low Tide.

HIGH TIDE

LOW TIDE

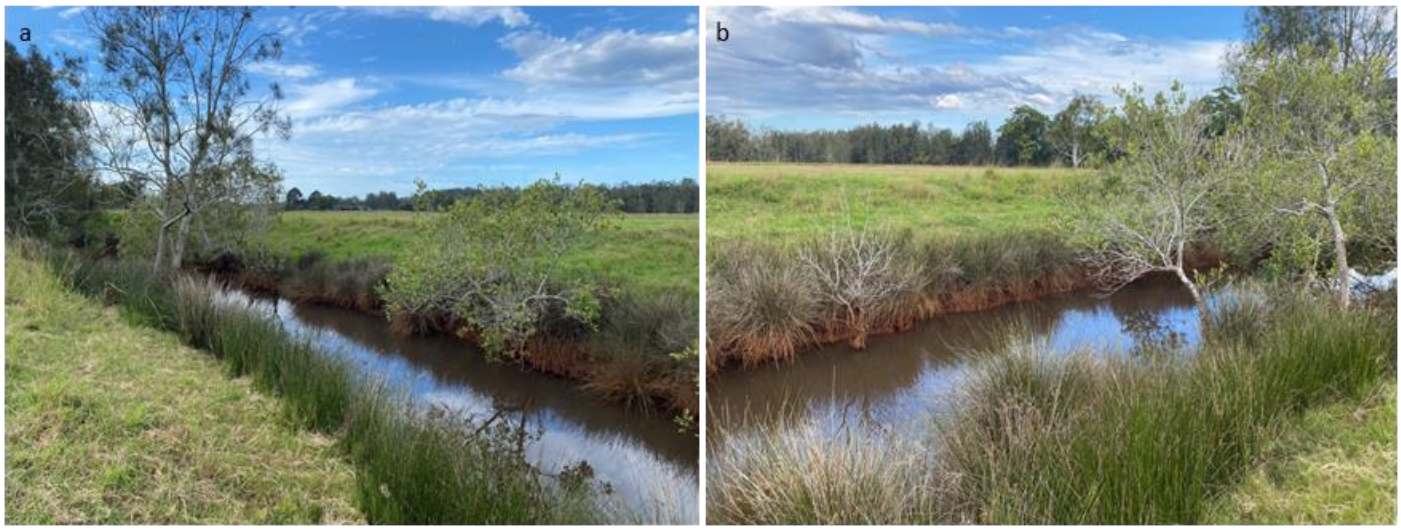
Plate 6: a) Site K06 facing upstream of Kooloonbung Creek, b) Site K06 facing downstream of Kooloonbung Creek at High Tide and Low Tide.

HIGH TIDE

LOW TIDE

Plate 7: a) Site K07 facing upstream of Kooloonbung Creek, b) Site K07 facing downstream of Kooloonbung Creek at High Tide and Low Tide.

HIGH TIDE



LOW TIDE

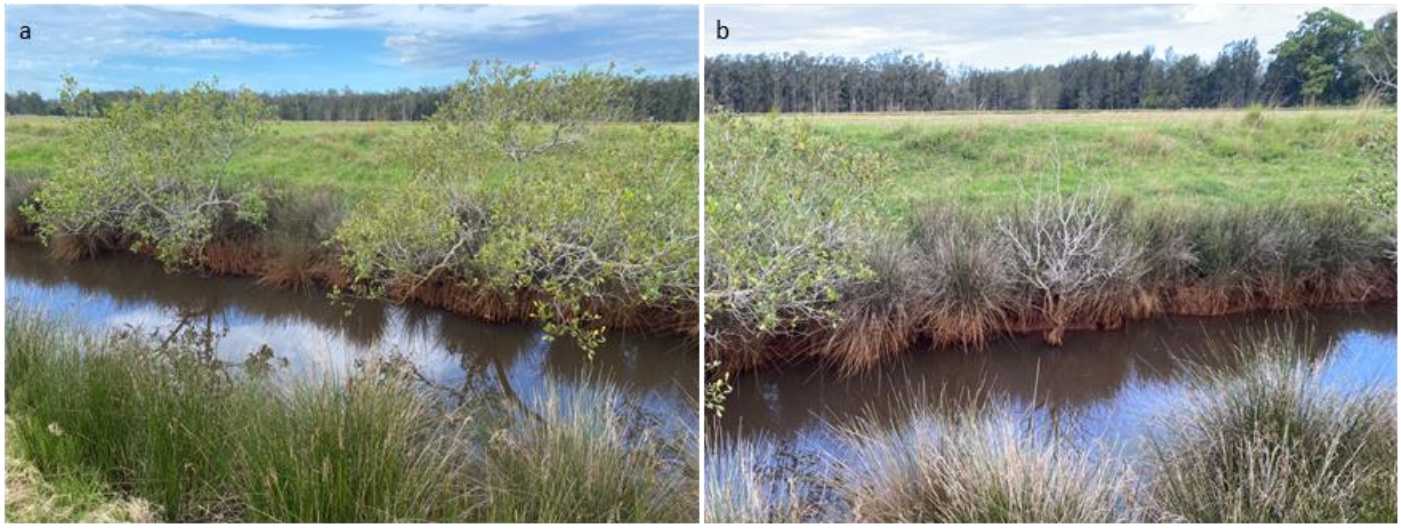


Plate 8: a) Site K08 facing upstream of Kooloonbung Creek, b) Site K08 facing downstream of Kooloonbung Creek at High Tide and Low Tide

Appendix 2

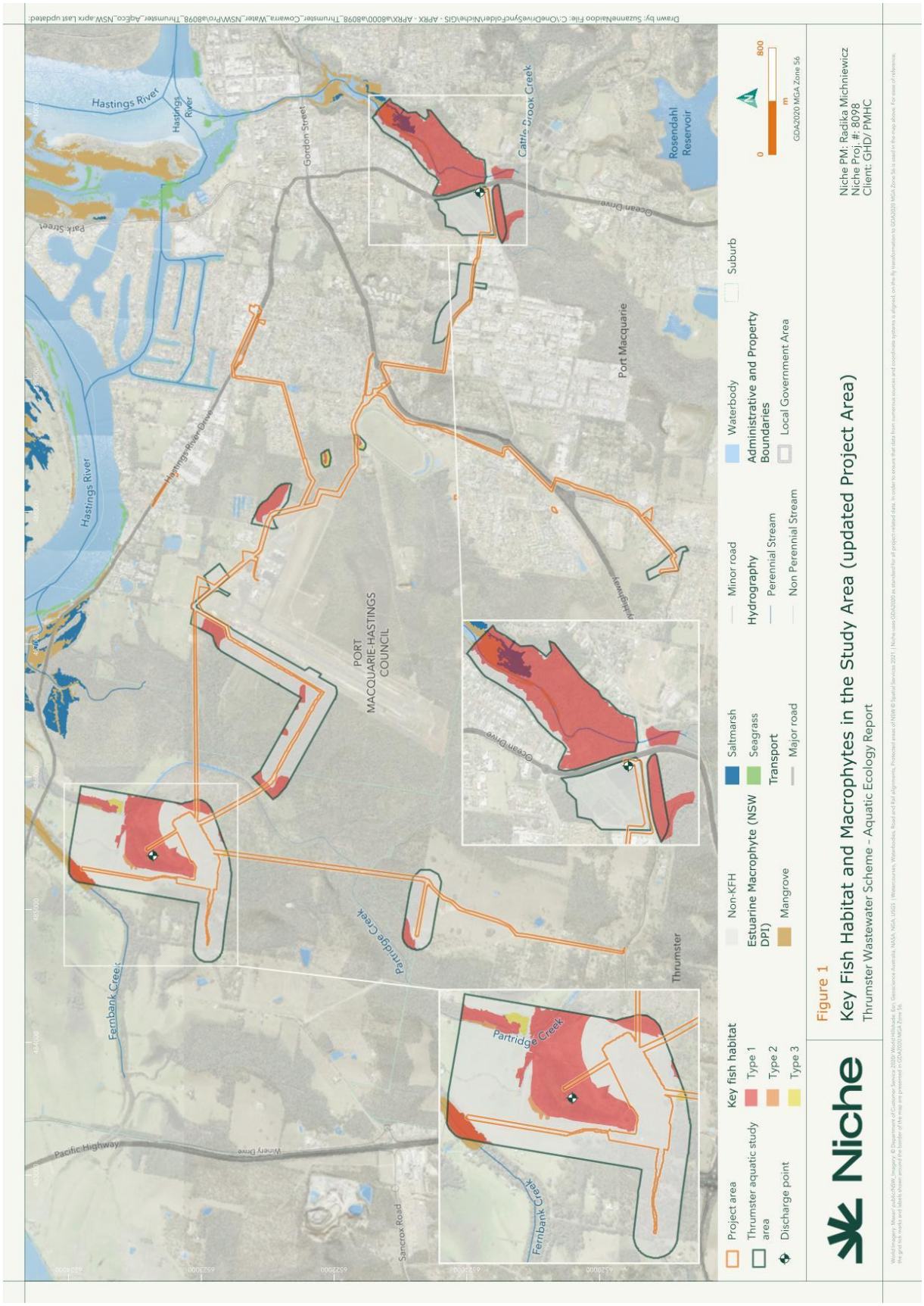


Figure 1: Key Fish Habitat and Macrophytes in the Study Area with updated Project Area

Appendix 3

Table 1: Average water quality values per monitoring period from Port Macquarie Wastewater Treatment Plant Environmental Compliance Reports

Period	Thermotolerant Coliforms (cfu 100mL -1)	pH (pH units)	Total Suspended Solids (mg L-1)	Biochemical Oxygen Demand (mg L-1)	Total Nitrogen (mg L-1)	Ammonia as N (mg L-1)	Total Phosphorus (mg L-1)	Oil and Grease (mg L-1)
Jan 2017 - Dec 2019	216.7	7.8	5	5	4.86	0.7	0.4	0
Jan 2021 - Dec 2021	339	7.5	3.5	5	4.63	0.76	0.27	0
Jan 2022 - Dec 2022	33	7.3	2.9	5	3.67	0.71	0.32	0
Jan 2023 - Dec 2023	196	7.6	5	5	5.29	1.59	0.41	0
Jan 2024 - Current	122	7.5	5	5	4.5	1.27	0.3	0

Table 2: Maximum water quality values per monitoring period from Port Macquarie Wastewater Treatment Plant Environmental Compliance Reports

Period	Thermotolerant Coliforms (cfu 100mL -1)	pH (pH units)	Total Suspended Solids (mg L-1)	Biochemical Oxygen Demand (mg L-1)	Total Nitrogen (mg L-1)	Ammonia as N (mg L-1)	Total Phosphorus (mg L-1)	Oil and Grease (mg L-1)
Jan 2017 - Dec 2019	25000	9.3	21	15	24.9	20.1	2.44	10
Jan 2021 - Dec 2021	9500	8.3	15	5	6.87	2.9	0.84	0
Jan 2022 - Dec 2022	130	7.6	4	5	5.35	2.8	0.87	0
Jan 2023 - Dec 2023	3800	8.6	20	15	11.7	8.83	0.83	0
Jan 2024 - Current	2800	8.4	18	5	8.84	6.7	1.22	0

Table 3: Effluent flow values per monitoring period from Port Macquarie Wastewater Treatment Plant Environmental Compliance Reports

Period	Average Effluent Flow (KL per day)	Maximum Effluent Flow (KL per day)
Jan 2021 - December 2021	19,731	36,122
Jan 2022 - December 2022	21,257	35,452
Jan 2023 - December 2023	15,589	33,667
Jan 2024 - Current	17,534	34,344

C-3 Environmental Risk Assessment

Introduction

This section identifies the key environmental and social issues associated with the project and applies a risk screening matrix to rank issues in terms of their relevance and importance to the assessment of the potential impacts of the project. The results of the risk screening exercise are reflected in the level of assessment of each of the key issues within the Thrumster EIS Report (GHD, 2024).

Approach to Identification of Key Environmental Issues

An initial screening of potential issues for consideration in the EIS was undertaken as part of the *Thrumster Wastewater Scheme Scoping Report – State Significant Infrastructure*, submitted to DPHI on 28 March 2023 (GHD, 2023). The initial screening process has been re-evaluated to include additional information that has been received regarding the key environmental and social issues associated with the project, and to also include additional issues of concern that have been identified as part of the EIS and associated community consultation process.

Risk screening

The preliminary risk screening for the project was undertaken using the EIS scoping worksheet to consider the likelihood of an environmental impact occurring and the consequence of that impact should it not be mitigated.

The impact rating guide was used to determine the characteristic of each potential impact (refer Table C.1).

Table C.1 Impact rating guide

Characteristic	Definition	Material effect examples (indicative only, not exhaustive)
Extent	The geographical area affected by the impacts (or the number or proportion of people or population groups who are affected)	– Impacts beyond the site boundary. – Impacts on moderate to large geographical areas (e.g. suburb or region, or larger). – Impacts affect a large proportion of a population group. – Impacts will have ripple effects on multiple matters.
Duration	The geographical area affected by the impacts (or the number or proportion of people or population groups who are affected)	– Permanent impact. – Life of the project or longer. – Specific project phase (or multiple). – Frequently occurring impact.
Severity	Scale or degree of change from the existing conditions as a result of an impact.	– Scale or extent of change from existing condition is substantial. – Will take substantial time and effort to reverse or ameliorate. – Ecological or community function, process, health, lifestyle or livelihood is expected to change substantially or be substantially disrupted/come to a halt.

Characteristic	Definition	Material effect examples (indicative only, not exhaustive)
Sensitivity	Susceptibility or vulnerability of people, receivers or receiving environment to adverse changes caused by the impact, or the importance placed on the matter being affected. Attributes of sensitivity include: – Conservation status – Intactness – Uniqueness or rarity – Resilience to change and capacity to adapt – Replacement potential – Impacts on vulnerable people – Of value or importance to the community.	– Disturbance of listed heritage, including Aboriginal cultural heritage. – Impacts on sensitive receivers (e.g. hospital, school, residential area). – Unique or widely recognised assets or values will be disturbed.

Screening of Environmental Assessment Significance

The preliminary risk screening process determined the key issues of environmental assessment significance to the project as shown in Table 1 below.

This screening allows for general prioritisation of environmental assessment issues based on their potential significance and does not take into account the application of mitigation measures to minimise and manage potential impacts. Reasonable and feasible mitigation measures would be applied to the project to minimise potential impacts.

Environmental Impact Statement (EIS) scoping worksheet for:			*Thrumster wastewater scheme - Port Macquarie Hastings Council* hh						10-Aug-22	29-Jul-24
What matters might be impacted?			**What activities might cause an impact?**		**What are the characteristics of the impact?**				**What level of assessment and engagement is required in the EIS preparation phase?**	
Social and environmental matters I.e. natural or human assets or values aggregated at the level most appropriate for informing management and assessment requirements *Click on the matter for a description, or the link above for full glossary*			**Without any mitigation, is the proposal likely to impact on the matter? *(Select from list)***	**If there is a 'likely' impact: 1. list the activities expected to cause the impact; and 2. if applicable, list the receptor being impacted and its status. *E.g. construction noise will be heard at nearby school* If 'unlikely', briefly explain why. Has the impact been actively avoided through project design or site location? *(Manual entry)***	**Is the impact, without mitigation, expected to cause a material effect with regard to its... *(Answer 'Y', 'N' or '?')* *Click on characteristic for description, or the link above for further detail***				**Does the impact need assessment in the EIS? *(Auto fills)***	**Expected level of assessment and/or engagement required *(Auto fills)***	**Updated following completion of specialist assessment**
					extent?	**duration?**	**severity?**	**sensitivity?**			
		acoustic	Likely	Construction noise would be heard at nearby sensitive receivers including schools, residences. Confirm operational noise	?	?	N	?	Unknown	Other Issue	Noise and vibration is identified as a key issue and raised by the community. A Noise and Vibration Impact Assessment (NVIA) has been prepared for the project. Outcomes of this NVIA identified that noise from WWTP and pipeline construction was predicted to exceed noise management levels (NML) at nearby sensitive receivers. Analysis indicated that daytime road traffic noise levels at at nearby sensitive receivers along Fernbank Creek Road south of Hastings River Drive and Hastings River Drive east of Winery Drive were predicted to exceed the controlling criterion of 55 dBA LAeq, (1 hour) and 60 dBA LAeq, (15 hour), respectively. Noise modelling predictions indicated no adverse impacts during the operation of the project at surrounding sensitive receivers. The relative increases in road traffic noise levels associated with the operation of the WWTP are predicted to be less than 0.5 dBA. These changes are compliant with the guidance contained in the RNP (EPA 2011). Mitigation measures for construction and operational noise impacts are identified in the NVIA to minimise potential impacts.
		visual	Likely	Construction only. Likely but unavoidable during works. Confirm visual impact at STP site	Y	Y	?	?	Yes	Other Issue + CIA	Visual impact is identified as a key issue and raised as a potential issue near to the proposed WWTP. A Landscape Character and Visual Impact Assessment report has been prepared for the project. Views towards the WWTP would be predominantly screened from the public view by existing dense native bushland. During construction of the network infrastructure minor, temporary potential impacts were identified. Cumulative impacts during construction are expected to be minor. The impacts on the landscape character and visual amenity of the project have been assessed as negligible for construction and mainly negligible during operation, with moderate impacts expected in close proximity to the WWTP.
	AMENITY	odour	Likely	STP will be odour source and impacts will be subject to nearest sensitive receivers and airshed behaviour	Y	Y	?	Y	Yes	Key Issue + Focussed Engagement	Odour has been assessed as part of the Air Quality Impact Assessment report (AQIA). Assessment of odour impacts was undertaken based on a review of the operational activities, review of the recommended separation distances, estimation of odour emissions based on review of similar operating plants, and prediction of impacts at the nearest sensitive receptors using dispersion modelling. Three scenarios were modelled with varying use of the odour control unit (OCU). Predicted concentrations complied with the criteria at all receptors for all modelled scenarios, with increased use of the OCU leading to reduced odour impacts at the receptors. Based on this, the risk of odour impacts at nearby sensitive receptors is considered to be low. Management and mitigation measures have been proposed for general operation of the project to further reduce risk of odour emissions.
		microclimate	n/a	Project is not of a sufficient extent or structure to influence microclimate in locality	N	N	N	N	No	No assessment necessary - Worksheet only	NA

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Social and environmental matters **I.e. natural or human assets or values aggregated at the level most appropriate for informing management and assessment requirements** ***Click on the matter for a description, or the link above for full glossary***			**Without any mitigation, is the proposal likely to impact on the matter?** ***(Select from list)***	**If there is a 'likely' impact:** **1. list the activities expected to cause the impact; and** **2. if applicable, list the receptor being impacted and its status.** *E.g. construction noise will be heard at nearby school* **If 'unlikely', briefly explain why. Has the impact been actively avoided through project design or site location?** ***(Manual entry)***	**Is the impact, without mitigation, expected to cause a material effect with regard to its...** ***(Answer 'Y', 'N' or '?')*** ***Click on characteristic for description, or the link above for further detail***				**Does the impact need assessment in the EIS?** ***(Auto fills)***	**Expected level of assessment and/or engagement required** ***(Auto fills)***	**Updated following completion of specialist assessment**
					extent?	**duration?**	**severity?**	**sensitivity?**			
What does the proposal mean for people?		*other - please specify*	n/a							No assessment necessary - Worksheet only	Vibration: A NVIA has been prepared for the project. Vibration from the construction of the WWTP identified no existing sensitive receivers within the structural damage safe working distances. During pipeline trenching construction, residential and non-residential receivers that are nearby may potentially experience vibration levels above the DIN 4150 structural damage safe working distances. At the WWTP work location, sensitive receivers were identified to potentially experience vibration levels above the British Standard and Assessing Vibration: a technical guideline (AVTG) (2006). AVTG daytime human comfort criteria during the access road construction activities. During trenching construction activities, residential and non-residential receivers that are nearby may potentially experience vibration levels above the British Standard and AVTG daytime human comfort criteria. No operational vibration impacts are anticipated given the distance between the nearest sensitive receivers to the WWTP and the pipelines will be buried underground. Mitigation measures for construction and operational vibration impacts are identified in the NVIA to minimise potential impacts.
	ACCESS	access to property	Likely	Construction only, where pipeline installation works are in road easement, driveway access to be considered	Y	N	N	Y	Yes	Other Issue + Focussed Engagement	A Traffic and Transport Assessment (TTA) has been prepared for the project. Access to properties may be restricted temporarily for certain activities, however these activities would be short-term and undertaken in consultation with landowners and/or relevant property managers. Mitigation measures would be implemented prior to and during construction to minimise impacts on traffic and transport networks and minimise environmental impacts associated with the movement of vehicles during construction, including the development of a TMP. This is particularly key for management of potential safety risks associated with the intersection of Hastings River Drive and Fernbank Road and is expected to include construction zone speed reductions, use of signage and traffic controllers to support turning of large vehicles.
		utilities	Likely	Construction requiring route selection to consider existing utilities such as in corridors	Y	Y	N	?	Yes	Other Issue + CIA	Utilities are addressed in TTA report. It is anticipated that some assets may require relocation to facilitate the installation of the pipeline. Determination of any required asset relocation would be undertaken during detail design.
		road and rail network	Likely	Construction works in road easement for pipeline installation; road verge would be temporarily unavailable in some urban areas; possible traffic controls temp part road closures	Y	Y	N	Y	Yes	Other Issue + CIA	Utilities are addressed in TTA report. Once fully operational it is anticipated that three to four FTE employees would be required to manage the onsite operations at the WWTP, which is similar to the existing Port Macquarie WWTP. The impacts of the WWTP operational traffic on the adjoining road network are expected to be negligible.
		offsite parking	Unlikely	Construction only. Parking areas could be considered as options for laydown areas and construction compounds. Personnel parking to be considered	N	N	N	N	No	Other Issue + CIA + Focussed Engagement	NA
		other - please specify	n/a							No assessment necessary - Worksheet only	NA
	BUILT ENVIRONMENT	public domain	Unlikely	Public built assets not expected to intersect with works after construction	N	N	N	?	No	Scoping Report	NA
		public infrastructure	Likely	Public infrastructure (Port Macquarie Airport) is adjacent to pipeline footprint . Construction impacts more relevant	Y	N	N	Y	Yes	Key Issue + Focussed Engagement	New public infrastructure is assessed in the Land Use and Property seciton of the EIS. The project would require the use of land both temporarily and permanently. While the permanent land requirements would commence during construction, these impacts would be long-term and relate to the operation and maintenance of the new infrastructure.
		other built assets	Likely	Pipeline route passes adjacent to Port Macquarie Racecourse , rifle range - Crown Land	Y	N	N	Y	Yes	Key Issue + CIA + Focussed Engagement	
		other - please specify	n/a							No assessment necessary - Worksheet only	NA
		natural	n/a	Not located in natural heritage areas. Potential related issues addressed by Coastal Wetland and biodiversity assessments						No assessment necessary - Worksheet only	

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Social and environmental matters I.e. natural or human assets or values aggregated at the level most appropriate for informing management and assessment requirements *Click on the matter for a description, or the link above for full glossary*			Without any mitigation, is the proposal likely to impact on the matter? *(Select from list)*	If there is a 'likely' impact: 1. list the activities expected to cause the impact; and 2. if applicable, list the receptor being impacted and its status. *E.g. construction noise will be heard at nearby school* If 'unlikely', briefly explain why. Has the impact been actively avoided through project design or site location? *(Manual entry)*	Is the impact, without mitigation, expected to cause a material effect with regard to its... *(Answer 'Y', 'N' or '?')* *Click on characteristic for description, or the link above for further detail*				Does the impact need assessment in the EIS? *(Auto fills)*	Expected level of assessment and/or engagement required *(Auto fills)*	Updated following completion of specialist assessment
					extent?	duration?	severity?	sensitivity?			
	HERITAGE	cultural	n/a		N	N	N	?	No	No assessment necessary - Worksheet only	Cultural heritage is identified as a key issue. A Historic Heritage Assessment was prepared for the project. Overall, the project would have a negligible to low direct, visual and cumulative impact on historical heritage values within the project area. There would be no impacts to World, National, Commonwealth, State or locally listed heritage as a result of the construction or operation of project. Mitigation measures are required for indirect impacts and unexpected finds.
		Aboriginal cultural	Likely	Heritage items mapped within and near study area - AHIMS search	Y	Y	Y	Y	Yes	Key Issue + CIA + Focussed Engagement	Aboriginal cultural heritage is identified as a key issue. An Aboriginal Cultural Heritage Assessment (ACHA) was undertaken for the project. Four Aboriginal cultural heritage sites were recorded within the project area, and one along the border of the project area. One site has been previously destroyed and one appears to have the artefacts associated with the item previously collected. Two sites would require establishment of exclusion zones to ensure no direct impacts. One remaining site, Thrumster PAD 1 occurs within a culturally sensitive landform on raised, level ground adjacent to an area of extensive wetlands associated with a range of resources to support Aboriginal occupation and use The design proposed for the WWTP and ancillary infrastructure would intercept a portion of the PAD area. A test excavation program would be undertaken prior construction in accordance with the Testing Methodology.
		built	Unlikely	some pipeline installataion works are adjacent to Cemetery, LEP Heritage sites	N	N	N	?	No	Other Issue	Built heritage is considered in the Historic Heritage Assessment, which was prepared for the project. While the project area transects the northernmost extent of the former RNE listed Port Macquarie Rifle Range, no relics or built heritage items related to the historic period were noted within the project area during the site inspection.
		other - please specify	n/a							No assessment necessary - Worksheet only	NA
	COMMUNITY	health	Unlikely	Project not likely to affect human health except for risks in the case of emergency or hazard management planning. Operationally no significant standard issues. Separate industry and technical guidance for STPs and recycled water use at post-approval stage. Consideration of treated water for environmental management may be included in the assessment.	N	N	N	Y	No	Other Issue + Focussed Engagement	A health impact assessment has been prepared for the project. This assessment looked at the potential for impacts to community health due to the project. The SIA found that the key social benefits of the project were primarily related to the provision of wastewater infrastructure and utilities to the community which may improve overall health and wellbeing of Port Macquarie residents, both existing and future.
		safety	Likely	Construction stage in urban areas will require safety and exclusion measures. Safety measures during construction stage required all locations.	N	Y	N	Y	Yes	Other Issue	Safety has been considered as part of the EIS in a number of sections including: Preliminary Hazard Analysis (PHA) Report, flood assessment, Health Impact Assessment and Bushfire Risk Assessment.
		services and facilities	n/a	project unlikely to impede, change or limit community services and facilities.						No assessment necessary - Worksheet only	Services and facilities have been considered as part of the EIS. A Social Impact Assessment (SIA) was prepared for the project. A key project outcome is the provision of wastewater infrastructure and utilities to the community. These services and facilities are required to serve the growing populating of the region.
		cohesion, capital and resilience	n/a	Project is unlikely to affect community cohesion capital and resilience. STP footprint has limited disturbance area and is not prominent after completion						No assessment necessary - Worksheet only	NA
		housing	n/a	No housing affected or housing areas						No assessment necessary - Worksheet only	NA
		other - please specify	n/a							No assessment necessary - Worksheet only	NA
	ECONOMIC	natural resource use	n/a	Construction materials use will be selected based on mininimising consumption and waste. No ongoing resource consumption other than electricity and standard water connection TBA	N	N	N	N	No	No assessment necessary - Worksheet only	NA
		livelihood	n/a	Project supports long term livelihood of locality due to improved capacity of wastewater system, support growth, create employment on site	N	N	N	N	No	No assessment necessary - Worksheet only	NA
		opportunity cost	n/a	Project does not remove opportunities for economoic development						No assessment necessary - Worksheet only	NA
		other - please specify	n/a							No assessment necessary - Worksheet only	NA

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Social and environmental matters **I.e. natural or human assets or values aggregated at the level most appropriate for informing management and assessment requirements** ***Click on the matter for a description, or the link above for full glossary***			**Without any mitigation, is the proposal likely to impact on the matter?** ***(Select from list)***	**If there is a 'likely' impact:** **1. list the activities expected to cause the impact; and** **2. if applicable, list the receptor being impacted and its status.** *E.g. construction noise will be heard at nearby school* **If 'unlikely', briefly explain why. Has the impact been actively avoided through project design or site location?** ***(Manual entry)***	**Is the impact, without mitigation, expected to cause a material effect with regard to its...** ***(Answer 'Y', 'N' or '?')*** ***Click on characteristic for description, or the link above for further detail***				**Does the impact need assessment in the EIS?** ***(Auto fills)***	**Expected level of assessment and/or engagement required** ***(Auto fills)***	**Updated following completion of specialist assessment**
					extent?	**duration?**	**severity?**	**sensitivity?**			
What does the proposal mean for the natural environment?	AIR	particulate matter	Likely	Construction stage at pipeline may generate dust that could affect sensitive resceivers (residential)	N	Y	N	Y	Yes	Other Issue	An air quality impact assessment has been prepared for the project. A qualitative assessment was undertaken to estimate the impacts of dust emissions for the construction stage in accordance with the Guidance on the assessment of dust from demolition and construction (Institute of Air Quality Management, 2024). Emissions from demolition, earthworks, construction and trackout were identified as low risk for all dust soiling and human health impacts, and medium risk for ecological impacts for construction of the WWTP. General management and mitigation measures have been proposed for construction to further reduce risk of dust emissions. Additional mitigation measures have been proposed for construction in areas within 20 metres of the nearest sensitive receptors.
		gases	n/a	Construction stage may generate vehicle emissions						No assessment necessary - Worksheet only	A Greenhouse Gas Assessment has been prepared for the project. This assessment identified the greenhouse gas emission sources during construction and operaiton of the project.
		atmospheric emissions	n/a	No other specific atmospheric emissions e.g. exhaust or stacks associated with the project, odour mgmt separate issue						No assessment necessary - Worksheet only	A Greenhouse Gas Assessment has been prepared for the project. This assessment identified the greenhouse gases and the correspodning global warming potential.
		other - please specify	n/a							No assessment necessary - Worksheet only	NA
	BIODIVERSITY	native vegetation	Likely	Clearing for construction, APZ, possible pipeline route clearing	?	Y	?	Y	Yes	Key Issue + Focussed Engagement	Biodiversity is identified as a key issue for the project. A biodiversity development assessment report (BDAR) has been prepared for the project. This assessment has been undertaken in accordance with the Biodiversity Assessment Method (BAM).
		native fauna	Likely	Clearing for construction, APZ, possible pipeline route clearing	?	Y	?	Y	Yes	Key Issue + Focussed Engagement	Biodiversity is identified as a key issue for the project. A biodiversity development assessment report (BDAR) has been prepared for the project. This assessment has been undertaken in accordance with the Biodiversity Assessment Method (BAM).
		other - please specify	n/a							No assessment necessary - Worksheet only	Aqautic ecology has been identifed as a key issue. An aquatic ecology assessment has been prepared for the project. Construction works have been designed to avoid direct impacts on KFH via locating required infrastructure outside these areas where possible and utilizing horizontal directional drilling methods to minimise disturbance where pipelines need to cross creeks and waterways between the plant and discharge point. Potential operational impacts of the project are primarily related to the discharge of effluent into Kooloonbung Creek. Given the assimilation capacity of mangroves and saltmarsh plants and the minimal impacts on water quality, the magnitude of impact on the health of these ecological communities is predicted to be minimal and typically confined to edge effects around the creek banks.
	LAND	stability and/or structure	n/a	Project would not modify or shape landform or ground surface in way that subtantially would affect land stability or ground structure						No assessment necessary - Worksheet only	NA
		soil chemistry	Likely	Acid sulfate soils in project area. Construction stage Excavation and levelling of treatment plant site. Pipeline installation	y	y	y	y	Yes	Key Issue	Soils are assessed as part of the Preliminary Site Investigation (PSI) report and via desktop method in the EIS.
		capability	Unlikely	Rezoning of small area of RU1 land to IN zoning at STP site. Land not in use for agriculture. Other land use not limited by pipeline installation - largely within easements. Consideration of treated water for environmental management may be included in the assessment.	N	N	N	Y	No	Other Issue + CIA	Land capability is addressed in multiple chapters of the EIS.
		topography	n/a	No significant changes to topography, views, drainage / landform	N	N	N	Y	No	No assessment necessary - Worksheet only	Topography is assessed via desktop method in the EIS and as part of the Preliminary Site Investigation (PSI) report.
		other - please specify	n/a							No assessment necessary - Worksheet only	NA
	WATER	water quality	Likely	construction stage will interact with drainage lines and coastal wetland and proximity area; operational management for hazards/risk	N	N	?	Y	Unknown	Other Issue + CIA + Focussed Engagement	Water quality has been identified as a key issue for the project. The impacts associated with discharges of effluent to receiving waters has been assessed by Intrawater in Technical Report 1B – Operational Water Quality assessment through the application of a project specific Water Quality Response Model (WQRM). Mitigation measures have been recommended for the project, including CEMP, OEMP and FMP. On the basis of the in-built measures and with the implementation of the identified additional mitigation measures, the project is not anticipated to result in unacceptable impacts on receiving environments in relation to water.
		water availability	n/a	project is water treatment project thus will intrinsically depend on water availability, however the work itself does not consume water in significant volumes, water availability expected to increase as a result fo project (recyled water)	N	N	N	?	No	No assessment necessary - Worksheet only	Water availability is addressed in the Technical Report 1A – Water Resources and Flooding assessment.

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					extent?	**duration?**	**severity?**	**sensitivity?**			
		hydrological flows	Unlikely	Hydrological regimes are not expected to be affected by the project although works are adjacent to CW / in flood area	N	N	N	?	No	Key Issue + CIA	Hydrology and flooding are considered in the Technical Report 1A – Water Resources and Flooding, and Technical Report 1B – Technical Report 1B – Operational Water Quality Impact Assessment.
		other - please specify	n/a							No assessment necessary - Worksheet only	NA
What risks does the proposal face?	RISKS	coastal hazards	n/a	Not in coastal hazard mapped area	N	N	N	Y	No	No assessment necessary - Worksheet only	Coastal hazards has been considered in the EIS as a desktop assessment. The outcomes of the assessment identify there is no significant risk that the project would result in impacts to coastal erosion during construction or operation. Similarly, there is no significant risk that the construction or operational activities would be impacted by coastal erosion.
		flood waters	Likely	Flood zone at site may present project risk	Y	Y	Y	Y	Yes	Key Issue	Flooding is identified as a key issue for the project. A Water Resources and Flooding Assessment has been prepared for the project. Flood Planning Levels identified in the PMHC Flood Policy (2018) will be adopted to set proposed pad levels for the WWTP and provide a flood evacuation route via the alternative access to the WWTP. The two-tiered pad design will provide opportunity locate commercial and industrial facilities above the 1% AEP flood level including climate change and 0.5 metre freeboard critical infrastructure will be located on the second tier of the pad which is located above the Probable Maximum Flood as defined by the 2006 flood study. Additionally, pipe infrastructure would be located below ground and will be suitably designed to manage impacts during flood conditions. - A Flood Management Plan (FMP) is to be developed as part of the SWMP or CEMP to manage flooding during construction and a Flood Emergence Response Plan will be developed to manage flood risk during operation of the site.
		bushfire	Likely	Construction stage risks for bushfire ignition on site and from off site. Operational risks to built infrastructure. Dangerous goods storage additional hazard	Y	Y	Y	Y	Yes	Other Issue + CIA + Focussed Engagement	A bushfire risk assessment has been prepared for the project. Based on the assessment, the bushfire risk of the proposed WWTP are Low and can reasonably be considered tolerable. The assessment details the methods to avoid and reduce bushfire risks, as well as mitigation measures to address residual impacts. The assessment also assesses potential bushfire ignition risks associated with construction works and WWTP operation.
		undermining	n/a	no underground or deep excavations						No assessment necessary - Worksheet only	NA
		steep slopes	n/a	Project is located on flat ground						No assessment necessary - Worksheet only	NA
		other - please specify	n/a							No assessment necessary - Worksheet only	NA

Issues Prioritisation

Based on the risk screening presented in Table 1, key issues for consideration as part of the environmental impact assessment of the project have been identified. The SEARs identified the following as key issues for the EIS:

– Water – quality and resource
– Water – flooding and hydrology
– Aboriginal cultural heritage
– Non-Aboriginal heritage
– Social
– Ecologically sustainable development including greenhouse gas emissions
– Biodiversity
– National Parks Estate
– Aquatic ecology
– Traffic and transport
– Air quality
– Soils and contamination
– Waste and chemicals
– Noise and vibration
– Land use and property
– Health and public safety
– Visual and design
– Crown Lands

These issues have been discussed in further detail in the relevant sections of the project EIS (GHD, 2024).

Based on the impact assessments carried out for the EIS, a number of reasonable and feasible mitigation measures have been identified for the project to minimise those risks identified as of high or medium priority. Mitigation measures developed during the assessment process are summarised in Chapter 25 of the Thrumster EIS (GHD, 2024).

C-4 Acid Sulphate Soil Management Plan requirements

An ASSMP will be prepared as part of the CEMP for this project. The ASSMP will outline ASS management procedures to address the following DPHI comment:

– *"The development area includes works within mapped acid sulphate soils. Provide details of proposed treatments and methods of disposal." (DPHI)*

Purpose of the ASSMP

The purpose of the ASSMP is to inform the handling and treatment of ASS disturbed during construction works for the Project. This ASSMP will be prepared in accordance with *National Acid Sulfate Soils Guidance: National Acid Sulfate Soils Sampling and Identification Methods Manual* (Sullivan et al, 2018a) and national best practice as outlined in *National Acid Sulfate Soils Guidance: A synthesis* (Sullivan et al, 2018b). The NSW Department of Planning and Environment indicates that these updated guidance document supplement the existing NSW *ASSMAC* guidelines.

The ASSMP will be a 'living document' that is to be referred to and updated on an ongoing basis throughout the duration of the construction programme as works progress and site-specific information for the various works being undertaken becomes available.

Ownership of the ASSMP

The ASSMP will be referred to and updated by the site environmental manager/project manager on an ongoing basis throughout the construction period.

Proposed disturbance activities

Search of the NSW Planning Industry and Environment eSpade site for ASS potential indicated that portions of the project are classified as H1, high probability of ASS <1 m below ground surface and L2, low probability of ASS between 1-3 below ground surface. The ASS in the area was a product of artificial drainage works in Partridge Creek between 1890 to 1989 which resulted to an enhanced oxidation of ASS in the area. The ASS potential for each segment is presented on Figure A-1, Appendix A and summarised below.

Segment	ASS Probability of Occurrence
1	Majority of the WWTP and its compound is located in an area with low probability of ASS occurrence (L2(p)) within 1-3 m below ground surface while the access road located north of the WWTP, and portions of the emergency discharge line are located in an area with high probability of ASS occurrence (H1) <1 m below ground surface.
2	Approximately 1.2 km of Segment 2 (from the WWTP) is located in a low (L2(p)) probability 1-3 m below ground surface and high (H1) probability of ASS occurrence <1 m below ground surface.
3	This segment is located in an area with high probability of ASS occurrence (H1) <1 m below ground surface.
4	The first 0.6 km length of this segment (from the WWTP) is located in areas of both low (L2(p)) from 1-3 m below ground surface and high probability of ASS occurrence <1 m below ground surface (H1), and the last 0.2 km of the segment (towards the point of intersection with Segments 3 and 5) is located in an area with high probability ASS occurrence <1 m below ground surface (H1). The rest of the segment is located in an area with no known occurrence of ASS.
5	The first 0.2 km of the segment (from the point of intersection with Segments 3 and 4) is located in area with high probability of ASS occurrence <1 m below ground surface (H1), while the last 0.7 km of this segment (towards Hastings River Dr) is located in an area with low probability of ASS occurrence from 1 - 3 m below ground surface (L2). The rest of the segment is located in an area with no known occurrence of ASS.
6	The first 0.6 km of this segment (from the point of intersection with Segments 5) is located in an area with no known ASS occurrence. The rest of the area were not classified.
7	South of the last 0.4 km of this segment is an area with low probability of ASS occurrence from 1-3 m below ground surface (L2(p)).

As detailed above in Section 15.3.1.1 of the EIS, HDD would be undertaken in areas of environmental sensitivity whereby trenching is deemed unsuitable. HDD is an alternative method of installation involving minimal disturbance of soil and due to no open trenching or dewatering required and can effectively exclude oxygen from soil during service installation minimising potential impacts associated with ASS disturbance. It is considered that the potential impacts associated with ASS can be managed through the implementation of HDD in areas of high ASS probability in conjunction with the mitigation measures detailed in Section 15.5 of the EIS. At typical depths of >15 m for the majority of the pipeline works, HDD may well be below ASS risk horizons for the majority of the segments.

The length of ASS impacted area to be disturbed along the construction route is approximately 3.6 km. HDD will disturb soil within a diameter of approximately 1 m. The HDD will also involve the excavation of entry and receival pits at either end of each of the relevant segments. It is estimated that approximately 3,000 tonnes of ASS could be disturbed during the HDD. Approximately 720 tonnes (~400 m^3) of ASS will also be excavated during the construction of the pump station on Boundary St. As outlined in the ASSMAC guidelines, projects that disturb great than 1000 tonnes of ASS with equal to or greater than 0.03% oxidisable sulfur or equivalent existing acidity, will require a detailed ASSMP.

General management approach

Avoiding or minimising disturbance of ASS will be the primary method of management, which will be undertaken through the use of HDD. Where avoiding disturbance is not possible, management techniques available for ASS can include:

– Chemical neutralisation (use of pure fine agricultural lime (AgLime) or a similar neutralising agent).
– Anoxic storage or placement of Potential Acid Sulphate Soils (PASS) below the water table and beneath clean non-ASS fill.
– Hydraulic separation of pyrite from the soil (high maintenance process suitable for coarse grained sediment).

The addition of agricultural lime is the most common amelioration technique applied to acid producing soils, where mechanical mixing is completed by plough or excavator to provide adequate homogeneity of the soil/sediment-lime mix.

The Construction Contractor will undertake the HDD in stages with the excavated and bored material treated and stockpiled in a bunded area. Following confirmation by laboratory testing, that the soils have been neutralised, soils can be disposed/re-used on site unless contaminated, in which case soils will be managed in accordance with a CEMP.

Acid sulfate soil assessment

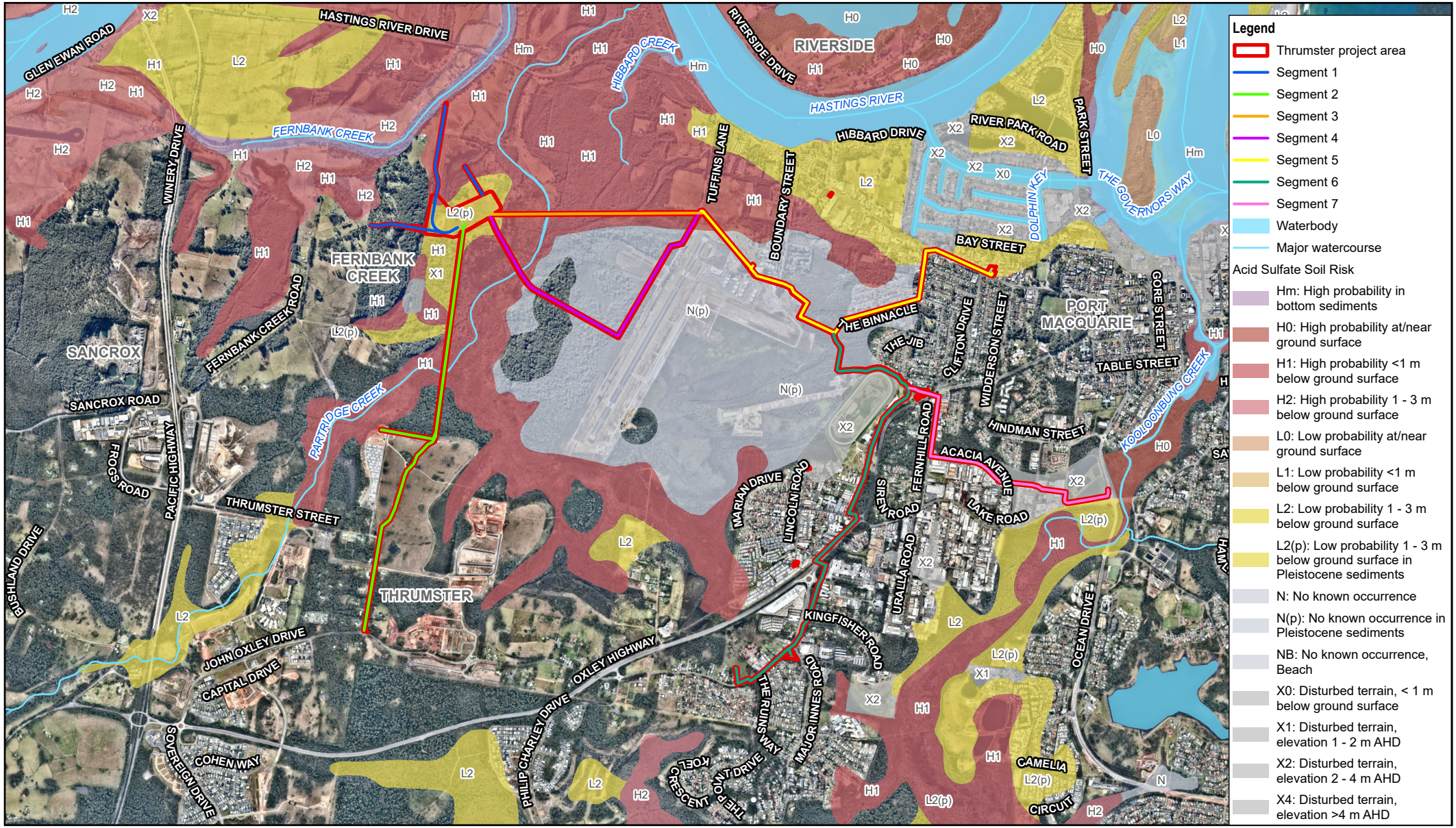
As ASS testing has not been undertaken within the Project area and ASS disturbance is likely to occur as part of construction works, a soil sampling program will be required to assist in characterising the extent and severity of ASS prior to construction. The soil sampling program shall be undertaken in accordance with the *National Acid Sulfate Soils Guidance -National acid sulfate soils sampling and identification methods manual* (Sullivan et al.,2018) and Net Acidity results, obtained from chromium reducible sulfur (CRS) laboratory analysis, compared to action criteria provided in Table 5.4 of the guidance to determine if the ASSMP will be triggered.

Requirements of the ASSMP

Once laboratory results have been obtained and the presence of ASS confirmed, an ASSMP will be prepared by a suitably qualified person detailing the specific management requirements to be adopted during construction works. A list of general requirements for the ASSMP are listed below:

– Provide a specification of the neutralising agents to be used in addition to liming rates to be adopted for soil neutralisation.
– Outline how soil stockpiles will be managed including, but not limited to, identification of an ASS treatment area, appropriate controls to prevent acidic runoff and seepage and runoff/seepage water management.

- Development of a monitoring program to verify that the proposed mitigation strategies are effective in minimising negative environmental impacts due to acid generation, which will include performance criteria for treated soil validation and any acidified water generated requiring treatment.
- A contingency plan that will be implemented, if the procedures outlined in the ASSMP fail to adequately treat stockpiled ASS, control discharge of ASS from the Project area and/or protect receiving environments from low pH/dissolved metals. The contingency plan will include both remedial and restoration actions.
- Outline occupational and environmental risk management procedures.
- Detail reporting requirements.



Paper Size ISO A4

0 0.35 0.7 1.05 1.4

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD

Port Macquarie-Hastings Council
Thrumster Wastewater Scheme
Soils and Contamination
Preliminary Site Investigations

Project No. **12611129**
Revision No. **0**
Date **26/06/2024**

Acid Sulfate Soils Risk probability map

FIGURE A.1

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Print date: 26 Jun 2024 - 12:42

Data source: NSW Government: DPE Acid Sulfate Soil Risk, 2022; PMHC: Infrastructure data, 2024; LPI: DTDB / DCDB, 2023; Nearmap WMS Server: Aerial imagery - date extracted 12/10/2023. Created by: fmackay

C-5 Response to Agency RFI, Technical memo (BecaHh20, 2024)

To:	Ali Ranjbar Major Projects Lead Port Macquarie Hastings Council	From:	David Perry Thrumster WWTP - Project Manager Beca HunterH2O
Copy to:	Damon Emerson – Beca HunterH2O Rana Kashif – PMHC	Date:	22 November 2024
Subject:	Response to Agency RFIs – Section 60 Review		

This memorandum provides response and additional information as requested from the Department of Climate Change, Energy, Environment and Water (DCCEEW) during the section 60 review and approval process.

1 Introduction

Port Macquarie Hastings Council (PMHC) has been developing the provision to construct the Thrumster Wastewater Treatment Plant (TWWTP) since the early 2000s to service this additional growth. An overview of the Thrumster Wastewater Scheme is shown below. The proposed Thrumster Wastewater Treatment Plant provides a treatment facility that serves the areas of greater Sancrox, Fernbank Creek, Thrumster as well as a number of existing catchments areas currently serviced by the PMWWTP.

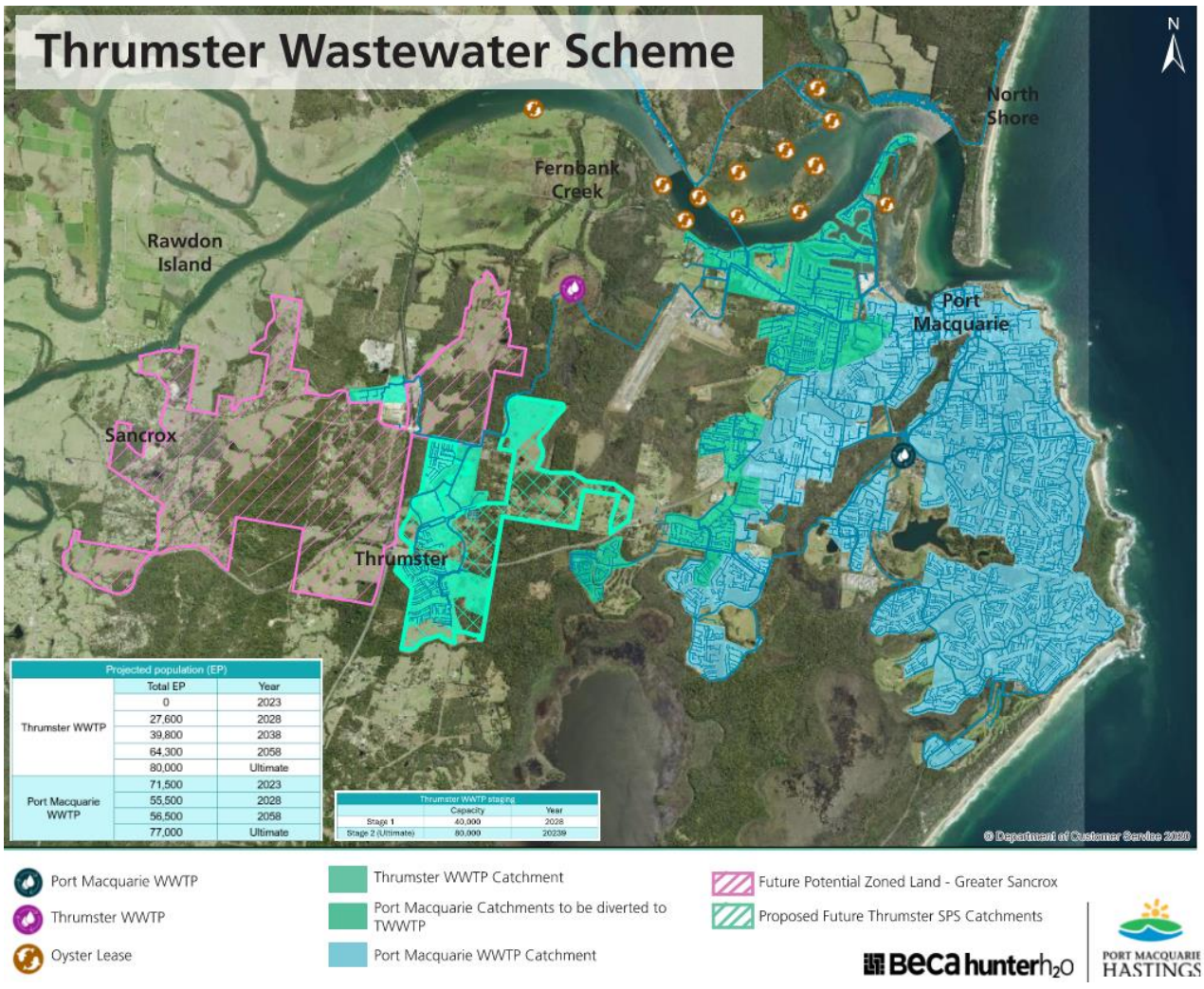

Figure 1: Overview of the Thrumster Wastewater Scheme

2 Response to Agency RFI

To support PMHC in preparing a response to the RFI, Beca HunterH2O has been asked to provide the following:

a table demonstrating:

a) volumetric discharge to the Kooloonbung Creek in different months / season for average dry weather and wet weather conditions, and discharge amount of the contaminants (Nitrogen, enterococci, … kg / day)

b) the improving impact of the reduction of the contaminants by diversion of sewer from PMWWTP to THWWTP by improvement in treatment level and reuse of the recycled water (Quantitively assessment indicating reduction in parameters / contaminants) during average weather condition. X

- b.1) Flows with higher treatment from TWwTP (diversions in place) + additional Thrumster flows due to growth - what is improvement due to higher treatment
- b.2) Reduced flows with RW diverted from TWwTP - what is improvement again with reduction in discharge.

a graph demonstrating:

- C) Base flows from PMWwTP to be presented in graph vs year (would potentially increase up to what the licence limit is for discharge flows to represent an increased load that is allowed under the EPL)

Data presented in this report considers the nutrient loads discharged to Kooloonbung Creek based on a dry, average and wet rainfall years to align with the WQIA and EIS. The WQIA adopted modelling over a financial year, as such the years presented are 2018/2019 (dry), 2015/2016 (average) and 2011/2012 (wet). To ensure consistency, the loads assessed have been taken from the same data set used in the WQIA.

2.1 *Monthly Volumetric Flow and Load Data (to address item a)*

Further analysis has been conducted to determine monthly and seasonal volumetric loads discharged from the Thrumster and Port Macquarie WWTPs. The data presented assumes no reuse flows occurred during the 12 month period and storm pond discharges (if any) occur at the storm pond location. The modelled parameters are for the design population (40,000EP).

Data for cumulative flow, total nitrogen and total phosphorus are presented in Table 2 and Table 3, all other modelled parameters are presented in Attachment A.

- For Thrumster WWTP, the data presented assumes no reuse flows occurred during the 12 month period and storm pond discharges (if any) occur at the storm pond location.
- For Port Macquarie WWTP, the data presented assumes no reuse flows and no evaporation from the lake road lagoons occurred during the 12 month period.

2.2 *Reduced loads due to improved quality from Thrumster compared with Port Macquarie WWTP (to address item b.1)*

Modelled effluent quality for Thrumster WWTP and Port Macquarie WWTP are similar. The median results adopted are presented in Table 1.

- The Thrumster WWTP quality has been based on the nominated requirements to achieve the “Accepted Modern Technology”. Median concentrations adopted align with the required performance to achieve the

90%ile concentrations adopted in the Thrumster WWTP concept design report and later modelled during the WQIA.

- The Port Macquarie WWTP effluent quality is based on the historical monthly results.

Table 1: Median concentrations adopted for WQIA modelling for Thrumster and Port Macquarie WWTP

Parameter	Median Concentrations (mg/L)	
	Thrumster WWTP	Port Macquarie WWTP
Total Nitrogen	6.0	5.5
Total Phosphorus	0.52	0.62

Reduced nitrogen loads may be possible for the Thrumster WWTP due to the adopted conservative oxidation ditch configuration. This configuration was adopted due to time constraints with the delivery (i.e. EIS and concept design completed in parallel without known final effluent quality). Therefore, it may be possible to get a 20 to 30% reduction in the nitrogen loads from the plant due to removal of nitrates.

PMHC have committed to the oxidation ditch configuration but adopting a lower median design target for nitrogen from Thrumster WWTP at this stage presents risks to the timing, specifications and delivery of the treatment plant. Any reduction in loads should be considered once the plant is fully operational plant over several years.

2.3 *Reduced discharge flows from Thrumster (to address item b.2)*

It was requested that the loads discharged to Kooloonbung Creek consider reuse of effluent within the dual reticulation system. Analysis presented in Table 4 was conducted to determine reduced monthly and seasonal volumetric loads discharged from the Thrumster WWTP because of dual reticulation reuse demand. Data for cumulative flow, total nitrogen and total phosphorus, all other modelled parameters are presented in Attachment A.

Reuse volumes have been considered for the plant discharge with respect to rainfall years. The reuse flows have been calculated for each day based on the inverse of the normalised flow factor, meaning when dry weather flows are received, the reuse demand is higher and when the wet weather flows are received, the demand is lower. The overall average demand over 12 years has been made equal to the calculated average demand presented in the design report.

2.4 *Projected discharge flows for the development years (to address item c)*

Discharge flows to Kooloonbung Creek from both Thrumster and Port Macquarie WWTP have been presented in Figure 2. The flows adopt PMHCs philosophy of Thrumster WWTP receiving most of the future growth and Port Macquarie remaining relatively constant for the design horizon.

The flows presented are based on the following assumptions:

- Equivalent population increases are based on growth predictions established during the Thrumster WWTP peer review and during the Port Macquarie WWTP capacity assessment.
- The ADWF loading is multiplied by 120% for both plants to account for wet weather flows discharged throughout the year. This figure was determined based on historical flows from Port Macquarie WWTP.
- The Thrumster WWTP will divert all required load between January 2028 to January 2029.

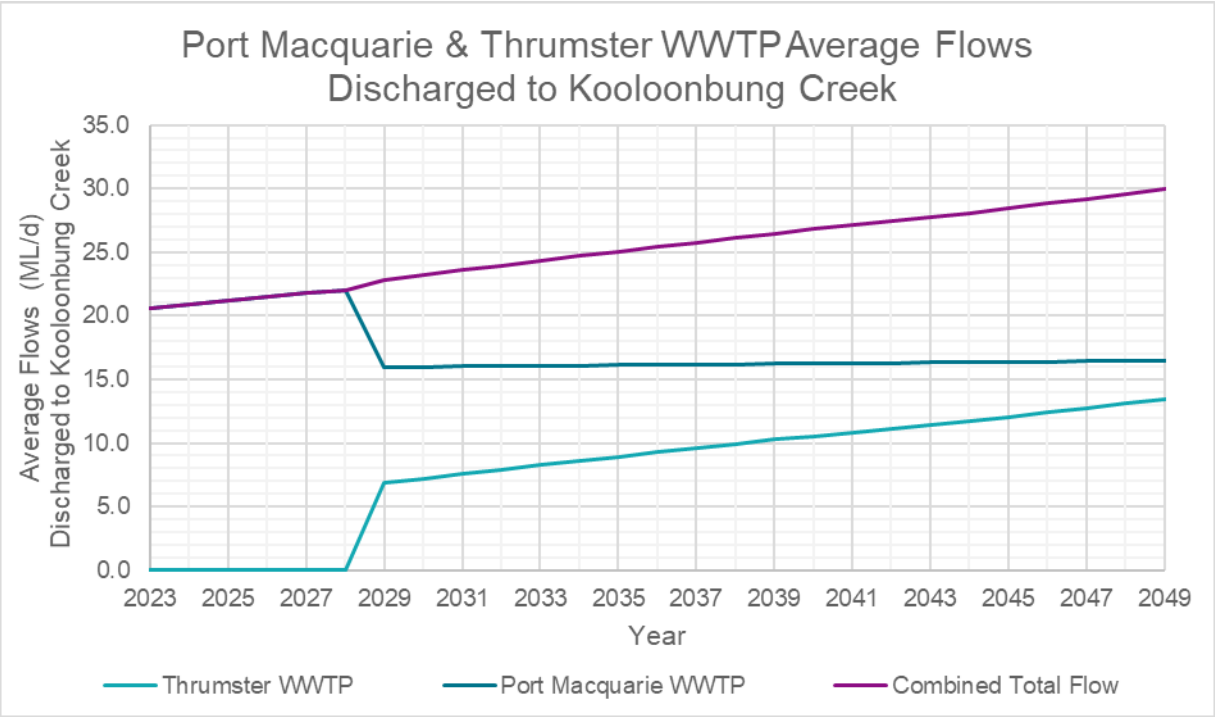

Figure 2: Thrumster and Port Macquarie WWTP Average Discharge Flow to Kooloonbung Creek

Table 2: Thrumster WWTP: Predicted discharge loads for total nitrogen and phosphorus based on modelled dry, average and wet rainfall years

Month	Discharged During Dry Year (2018/2019)			Discharged During Average Year (2015/2016)			Discharged During Wet Year (2011/2012)		
	Cumulative Monthly Flow (ML/Month)	Total Nitrogen (kg/month)	Total Phosphorus (kg/month)	Cumulative Monthly Flow (ML/Month)	Total Nitrogen (kg/month)	Total Phosphorus (kg/month)	Cumulative Monthly Flow (ML/Month)	Total Nitrogen (kg/month)	Total Phosphorus (kg/month)
July	314	1,886	163	434	2,602	225	404	2,426	210
August	269	1,615	140	320	1,918	166	349	2,096	182
September	261	1,563	135	292	1,754	152	361	2,169	188
October	283	1,700	147	301	1,803	156	387	2,324	201
November	268	1,608	139	397	2,381	206	428	2,568	223
December	270	1,623	141	354	2,125	184	366	2,198	191
January	290	1,739	151	346	2,074	180	331	1,986	172
February	253	1,521	132	313	1,880	163	482	2,894	251
March	283	1,697	147	278	1,670	145	347	2,085	181
April	274	1,643	142	274	1,644	143	396	2,376	206
May	278	1,669	145	269	1,611	140	334	2,005	174
June	271	1,629	141	296	1,776	154	440	2,641	229
Total	3,315	19,892	1,724	3,873	23,238	2,014	4,628	27,767	2,407
Seasonal Accumulation									
Winter (Jun, July, Aug)									
Spring (Sept, Oct, Nov)									
Summer (Dec, Jan, Feb)									
Autumn (Mar, Apr, May)									

Table 3: Port Macquarie WWTP: Predicted discharge loads for total nitrogen and phosphorus based on modelled dry, average and wet rainfall years

Month	Discharged During Dry Year (2018/2019)			Discharged During Average Year (2015/2016)			Discharged During Wet Year (2011/2012)		
	Cumulative Monthly Flow (ML/Month)	Total Nitrogen (kg/month)	Total Phosphorus (kg/month)	Cumulative Monthly Flow (ML/Month)	Total Nitrogen (kg/month)	Total Phosphorus (kg/month)	Cumulative Monthly Flow (ML/Month)	Total Nitrogen (kg/month)	Total Phosphorus (kg/month)
July	452	2,488	280	627	3,446	388	582	3,211	363
August	389	2,140	241	461	2,538	286	502	2,761	311
September	374	2,059	232	419	2,305	260	518	2,926	339
October	407	2,237	252	433	2,382	268	556	3,202	381
November	386	2,120	239	569	3,130	353	610	3,494	411
December	390	2,143	242	505	2,815	321	526	2,894	326
January	419	2,304	260	495	2,723	307	474	2,608	294
February	365	2,008	226	448	2,465	278	688	4,055	495
March	407	2,238	252	402	2,209	249	499	2,745	309
April	395	2,170	245	393	2,163	244	567	3,204	371
May	401	2,207	249	388	2,134	241	482	2,650	299
June	389	2,142	241	424	2,332	263	629	3,536	407
Total	4,774	26,254	2,960	5,565	30,641	3,458	6,634	37,286	4,306
Seasonal Accumulation									
Winter (Jun, July, Aug)									
Spring (Sept, Oct, Nov)									
Summer (Dec, Jan, Feb)									
Autumn (Mar, Apr, May)									

Table 4: Thrumster WWTP: Predicted discharge loads accounting for reuse for total nitrogen and phosphorus based on modelled dry, average and wet rainfall years

Month	Discharged During Dry Year (2018/2019)			Discharged During Average Year (2015/2016)			Discharged During Wet Year (2011/2012)		
	Cumulative Monthly Flow (ML/month)	Total Nitrogen (kg/month)	Total Phosphorus (kg/month)	Cumulative Monthly Flow (ML/month)	Total Nitrogen (kg/month)	Total Phosphorus (kg/month)	Cumulative Monthly Flow (ML/month)	Total Nitrogen (kg/month)	Total Phosphorus (kg/month)
July	212	1,269	110	361	2,169	188	324	1,945	169
August	154	921	80	224	1,346	117	260	1,558	135
September	148	888	77	188	1,129	98	276	1,655	143
October	172	1,034	90	197	1,180	102	299	1,793	155
November	159	952	83	317	1,899	165	349	2,091	181
December	155	929	81	255	1,531	133	280	1,679	146
January	182	1,094	95	250	1,501	130	235	1,411	122
February	153	918	80	221	1,327	115	417	2,503	217
March	173	1,035	90	166	998	86	257	1,541	134
April	167	1,003	87	166	998	87	315	1,892	164
May	166	997	86	153	916	79	241	1,445	125
June	162	972	84	195	1,167	101	368	2,210	192
Total	2,002	12,014	1,041	2,694	16,162	1,401	3,620	21,723	1,883
Seasonal Accumulation									
Winter (Jun, July, Aug)									
Spring (Sept, Oct, Nov)									
Summer (Dec, Jan, Feb)									
Autumn (Mar, Apr, May)									

Attachments

A. Thrumster WWTP Load Discharged – No Reuse
B. Port Macquarie WWTP Load Discharged – No Reuse
C. Thrumster WWTP Load Discharged – Reuse

Attachment A - Thrumster WWTP Load Discharged - No reuse

Thrumster WWTP Load Discharged - No Reuse - Low Rainfall											
			Cumulative Monthly WWTP Flow Discharged (ML/month)	Total Nitrogen Discharged (kg/month)	Total Phosphorus Discharged (kg/month)	NH3 (kg/month)	NOx-N (kg/month)	Org N (kg/month)	OP (kg/month)	Org-P (kg/month)	TOC (kg/month)
7	2018	July	314	1,886	163	63	1,414	409	157	6	3,335
8	2018	August	269	1,615	140	54	1,211	350	135	5	2,856
9	2018	September	261	1,563	135	52	1,172	339	130	5	2,764
10	2018	October	283	1,700	147	57	1,275	368	142	6	3,006
11	2018	November	268	1,608	139	54	1,206	348	134	5	2,843
12	2018	December	270	1,623	141	54	1,217	352	135	5	2,870
1	2019	January	290	1,739	151	58	1,305	377	145	6	3,076
2	2019	February	253	1,521	132	51	1,141	330	127	5	2,690
3	2019	March	283	1,697	147	57	1,272	368	141	6	3,000
4	2019	April	274	1,643	142	55	1,232	356	137	5	2,905
5	2019	May	278	1,669	145	56	1,252	362	139	6	2,952
6	2019	June	271	1,629	141	54	1,222	353	136	5	2,880
		Total	3,315	19,892	1,724	663	14,919	4,310	1,658	66	35,178
Thrumster WWTP Load Discharged - No Reuse - Average rainfall											
			Cumulative Monthly WWTP Flow Discharged (ML/month)	Total Nitrogen Discharged (kg/month)	Total Phosphorus Discharged (kg/month)	NH3 (kg/month)	NOx-N (kg/month)	Org N (kg/month)	OP (kg/month)	Org-P (kg/month)	TOC (kg/month)
7	2015	July	434	2,602	225	87	1,951	564	217	9	4,601
8	2015	August	320	1,918	166	64	1,438	415	160	6	3,391
9	2015	September	292	1,754	152	58	1,316	380	146	6	3,102
10	2015	October	301	1,803	156	60	1,352	391	150	6	3,189
11	2015	November	397	2,381	206	79	1,786	516	198	8	4,211
12	2015	December	354	2,125	184	71	1,593	460	177	7	3,757
1	2016	January	346	2,074	180	69	1,555	449	173	7	3,667
2	2016	February	313	1,880	163	63	1,410	407	157	6	3,325
3	2016	March	278	1,670	145	56	1,252	362	139	6	2,953
4	2016	April	274	1,644	143	55	1,233	356	137	5	2,908
5	2016	May	269	1,611	140	54	1,209	349	134	5	2,850
6	2016	June	296	1,776	154	59	1,332	385	148	6	3,140
		Total	3,873	23,238	2,014	775	17,428	5,035	1,936	77	41,096
Thrumster WWTP Load Discharged - No Reuse - High Rainfall											
			Cumulative Monthly WWTP Flow Discharged (ML/month)	Total Nitrogen Discharged (kg/month)	Total Phosphorus Discharged (kg/month)	NH3 (kg/month)	NOx-N (kg/month)	Org N (kg/month)	OP (kg/month)	Org-P (kg/month)	TOC (kg/month)
7	2011	July	404	2,426	210	81	1,819	526	202	8	4,290
8	2011	August	349	2,096	182	70	1,572	454	175	7	3,707
9	2011	September	361	2,169	188	72	1,626	470	181	7	3,835
10	2011	October	387	2,324	201	77	1,743	504	194	8	4,110
11	2011	November	428	2,568	223	86	1,926	556	214	9	4,542
12	2011	December	366	2,198	191	73	1,649	476	183	7	3,888
1	2012	January	331	1,986	172	66	1,490	430	166	7	3,513
2	2012	February	482	2,894	251	96	2,171	627	241	10	5,118
3	2012	March	347	2,085	181	69	1,563	452	174	7	3,686
4	2012	April	396	2,376	206	79	1,782	515	198	8	4,203
5	2012	May	334	2,005	174	67	1,503	434	167	7	3,545
6	2012	June	440	2,641	229	88	1,981	572	220	9	4,670
		Total	4,628	27,767	2,407	926	20,826	6,016	2,314	93	49,106

Attachment B - Port Macquarie WWTP Load Discharged - No reuse

Port Macquarie WWTP Load Discharged - No Reuse - Low Rainfall											
			Cumulative Monthly WWTP Flow Discharged (ML/month)	Total Nitrogen Discharged (kg/month)	Total Phosphorus Discharged (kg/month)	NH3 (kg/month)	NOx-N (kg/month)	Org N (kg/month)	OP (kg/month)	Org-P (kg/month)	TOC (kg/month)
7	2018	July	452	2,488	280	271	1,719	498	271	9	4,800
8	2018	August	389	2,140	241	233	1,478	428	233	8	4,128
9	2018	September	374	2,059	232	225	1,422	412	225	7	3,972
10	2018	October	407	2,237	252	244	1,546	447	244	8	4,316
11	2018	November	386	2,120	239	231	1,465	424	231	8	4,091
12	2018	December	390	2,143	242	234	1,481	429	234	8	4,134
1	2019	January	419	2,304	260	251	1,592	461	251	8	4,445
2	2019	February	365	2,008	226	219	1,387	402	219	7	3,873
3	2019	March	407	2,238	252	244	1,546	448	244	8	4,317
4	2019	April	395	2,170	245	237	1,499	434	237	8	4,187
5	2019	May	401	2,207	249	241	1,525	441	241	8	4,258
6	2019	June	389	2,142	241	234	1,480	428	234	8	4,132
		Total	4,774	26,254	2,960	2,864	18,139	5,251	2,864	95	50,652
Port Macquarie WWTP Load Discharged - No Reuse - Average Rainfall											
			Cumulative Monthly WWTP Flow Discharged (ML/month)	Total Nitrogen Discharged (kg/month)	Total Phosphorus Discharged (kg/month)	NH3 (kg/month)	NOx-N (kg/month)	Org N (kg/month)	OP (kg/month)	Org-P (kg/month)	TOC (kg/month)
7	2015	July	627	3,446	388	376	2,381	689	376	13	6,649
8	2015	August	461	2,538	286	277	1,753	508	277	9	4,896
9	2015	September	419	2,305	260	251	1,593	461	251	8	4,448
10	2015	October	433	2,382	268	260	1,645	476	260	9	4,595
11	2015	November	569	3,130	353	341	2,162	626	341	11	6,038
12	2015	December	505	2,815	321	343	1,908	566	308	13	5,511
1	2016	January	495	2,723	307	297	1,882	545	297	10	5,254
2	2016	February	448	2,465	278	269	1,703	493	269	9	4,756
3	2016	March	402	2,209	249	241	1,526	442	241	8	4,261
4	2016	April	393	2,163	244	236	1,494	433	236	8	4,173
5	2016	May	388	2,134	241	233	1,475	427	233	8	4,117
6	2016	June	424	2,332	263	254	1,611	466	254	8	4,498
		Total	5,565	30,641	3,458	3,379	21,133	6,131	3,344	114	59,195
Port Macquarie WWTP Load Discharged - No Reuse - High Rainfall											
			Cumulative Monthly WWTP Flow Discharged (ML/month)	Total Nitrogen Discharged (kg/month)	Total Phosphorus Discharged (kg/month)	NH3 (kg/month)	NOx-N (kg/month)	Org N (kg/month)	OP (kg/month)	Org-P (kg/month)	TOC (kg/month)
7	2011	July	582	3,211	363	362	2,206	643	351	13	6,221
8	2011	August	502	2,761	311	301	1,908	552	301	10	5,327
9	2011	September	518	2,926	339	402	1,937	592	322	17	5,829
10	2011	October	556	3,202	381	536	2,022	656	355	25	6,590
11	2011	November	610	3,494	411	539	2,253	712	386	24	7,090
12	2011	December	526	2,894	326	316	2,000	579	316	11	5,584
1	2012	January	474	2,608	294	285	1,802	522	285	9	5,032
2	2012	February	688	4,055	495	799	2,438	840	454	41	8,612
3	2012	March	499	2,745	309	299	1,896	549	299	10	5,295
4	2012	April	567	3,204	371	444	2,117	649	353	19	6,391
5	2012	May	482	2,650	299	289	1,831	530	289	10	5,112
6	2012	June	629	3,536	407	467	2,360	714	388	19	7,000
		Total	6,634	37,286	4,306	5,040	24,771	7,537	4,098	207	74,083

Attachment C - Thrumster WWTP Load Discharged - Reuse

Thrumster WWTP Load Discharged - Reuse - Low Rainfall											
			Cumulative Monthly WWTP Flow Discharged (ML/month)	Total Nitrogen Discharged (kg/month)	Total Phosphorus Discharged (kg/month)	NH3 (kg/month)	NOx-N (kg/month)	Org N (kg/month)	OP (kg/month)	Org-P (kg/month)	TOC (kg/month)
7	2018	July	212	1,269	110	42	952	275	106	4	2,245
8	2018	August	154	921	80	31	691	200	77	3	1,629
9	2018	September	148	888	77	30	666	192	74	3	1,571
10	2018	October	172	1,034	90	34	776	224	86	3	1,829
11	2018	November	159	952	83	32	714	206	79	3	1,684
12	2018	December	155	929	81	31	697	201	77	3	1,643
1	2019	January	182	1,094	95	36	821	237	91	4	1,936
2	2019	February	153	918	80	31	688	199	76	3	1,623
3	2019	March	173	1,035	90	35	777	224	86	3	1,831
4	2019	April	167	1,003	87	33	752	217	84	3	1,774
5	2019	May	166	997	86	33	748	216	83	3	1,763
6	2019	June	162	972	84	32	729	211	81	3	1,719
		Total	2,002	12,014	1,041	400	9,010	2,603	1,001	40	21,246
Thrumster WWTP Load Discharged - Reuse - Low Rainfall											
			Cumulative Monthly WWTP Flow Discharged (ML/month)	Total Nitrogen Discharged (kg/month)	Total Phosphorus Discharged (kg/month)	NH3 (kg/month)	NOx-N (kg/month)	Org N (kg/month)	OP (kg/month)	Org-P (kg/month)	TOC (kg/month)
7	2015	July	361	2,169	188	72	1,627	470	181	7	3,836
8	2015	August	224	1,346	117	45	1,010	292	112	4	2,381
9	2015	September	188	1,129	98	38	847	245	94	4	1,997
10	2015	October	197	1,180	102	39	885	256	98	4	2,087
11	2015	November	317	1,899	165	63	1,425	412	158	6	3,359
12	2015	December	255	1,531	133	51	1,149	332	128	5	2,708
1	2016	January	250	1,501	130	50	1,126	325	125	5	2,654
2	2016	February	221	1,327	115	44	995	287	111	4	2,346
3	2016	March	166	998	86	33	749	216	83	3	1,765
4	2016	April	166	998	87	33	749	216	83	3	1,765
5	2016	May	153	916	79	31	687	199	76	3	1,620
6	2016	June	195	1,167	101	39	876	253	97	4	2,064
		Total	2,694	16,162	1,401	539	12,122	3,502	1,347	54	28,582
Thrumster WWTP Load Discharged - Reuse - Low Rainfall											
			Cumulative Monthly WWTP Flow Discharged (ML/month)	Total Nitrogen Discharged (kg/month)	Total Phosphorus Discharged (kg/month)	NH3 (kg/month)	NOx-N (kg/month)	Org N (kg/month)	OP (kg/month)	Org-P (kg/month)	TOC (kg/month)
7	2011	July	324	1,945	169	65	1,459	421	162	6	3,440
8	2011	August	260	1,558	135	52	1,168	338	130	5	2,755
9	2011	September	276	1,655	143	55	1,241	359	138	6	2,927
10	2011	October	299	1,793	155	60	1,345	388	149	6	3,171
11	2011	November	349	2,091	181	70	1,568	453	174	7	3,698
12	2011	December	280	1,679	146	56	1,259	364	140	6	2,969
1	2012	January	235	1,411	122	47	1,058	306	118	5	2,495
2	2012	February	417	2,503	217	83	1,878	542	209	8	4,427
3	2012	March	257	1,541	134	51	1,156	334	128	5	2,726
4	2012	April	315	1,892	164	63	1,419	410	158	6	3,346
5	2012	May	241	1,445	125	48	1,084	313	120	5	2,555
6	2012	June	368	2,210	192	74	1,657	479	184	7	3,908
		Total	3,620	21,723	1,883	724	16,292	4,707	1,810	72	38,416

C-6 Terrestrial Biodiversity (de Witt, 2025)

21 February 2025

de Witt Ecology
▪ PLANNING ▪ SURVEYING
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Response to Submissions on Thrumster Wastewater Scheme (our project reference EC217)

1. Introduction

de Witt Ecology submitted a Biodiversity Development Assessment Report (BDAR) dated 24 July 2024 as part of an assessment of the Thrumster Wastewater Scheme in Port Macquarie, NSW. The BDAR was submitted as part of an Environmental Impact Statement (EIS) for the project and has since been exhibited. This letter report addresses minor issues raised by the Biodiversity, Conservation and Science Group (BCS) & National Parks and Wildlife Service (NPWS) of the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW), the Department of Planning, Housing and Infrastructure. We thank the departments for their reviews and respond to comments below.

2. Response to Comments from BCS

2.1 The project has the potential to cause a Serious and Irreversible Impact (SAII) on Giant Dragonfly and BCS recommends the proponent make further effort to avoid and minimise the impacts.

Following review of the BDAR, BCS raised concern that the project could cause a SAII for Giant Dragonfly. The BDAR had addressed Sections 7.1 and 7.2 of the BAM by reassessing the need to use the Partridge Creek Site and completely revising the method of wastewater treatment from using a treatment wetland to discharging at Kooloonbung Creek.

BCS recommended that the project area required for site compounds and laydown areas be reduced to prevent further impacts on potential Giant Dragonfly habitat. de Witt Ecology has discussed this option with the client and confirmed that further avoidance could occur in this location and has provided guidance on the extent that Giant Dragonfly habitat could be further avoided (Figure 1). The avoidance has reduced direct impacts on 1.04 ha of PCT 3967, with avoidance taken for the full extent of the vegetation zone where possible.

a) The previous design (cyan line) that impacted Giant Dragonfly habitat (light green area).

b) Current Design (cyan line) that avoids as much Giant Dragonfly habitat as possible.

Figure 1. Changes in Giant Dragonfly impact by the project.

Following this change a revised BDAR will be submitted to the department. This revised document will detail the changes and update the SAII assessment to be clear and accurate.

2.2 The subject land assessed in the Biodiversity Development Assessment Report (BDAR) does not cover the full extent of the development footprint.

BCS identified that the BDAR did not fully explain the proposed works within Fernhill Road, Acacia Avenue, and missed slivers of land within the Biodiversity Certification area that were not Biodiversity Certified or under the BioBanking Agreement.

Though some areas received minimal description as there were no biodiversity impacts, we thank the department for detecting areas that were missed during our assessment, particularly slivers within the Biodiversity Certification area that were not under Biocertification. An amended BDAR will be developed that fully describes these areas and has investigated areas that were missed during the previous assessment.

2.3 The proponent needs to revise the Plant Community Type (PCT) mapping to ensure it is consistent with the requirements of the Biodiversity Assessment Method 2020 (BAM)

Areas that were assessed as being exotic vegetation were determined based on findings from BAM Plots and interpretation of vegetation stratification by BAM Accredited Assessors. In some areas there may have been differences in GPS accuracy for interpretation of the location of the study area, particularly in narrow linear areas of the project.

de Witt Ecology has reviewed the suggested areas that could be considered native and have agreed to include them as native vegetation within relevant vegetation zones.

2.4 The project includes development within a BioBanking site which may not be permissible.

Works were initially proposed to occur within an existing access tracks within the BioBanking site as this would reduce impacts to native vegetation. However, following further advice the project has been revised such that it remains completely within the Biocertified lands when in proximity to the Port Macquarie Airport. See Figure 2 for an outline of the revised footprint.

a) The original proposed design (red line) did not stay completely within the Biocertified lands (green polygon). This avoided unnecessary vegetation removal.

b) The revised project design remains within the Biocertified land and does not intersect the BioBanking lands.

Figure 2. Change in footprint alignment to remain entirely within the Biodiversity Certified land.

2.5 The proponent needs to prepare a species polygon for *Melaleuca biconvexa*.

A species polygon for *Melaleuca biconvexa* was not prepared, as the recorded individual is not directly impacted by the proposal. Additionally, the surrounding area is under long-term management, which prevents the species from establishing within the project footprint. The presence of exotic vegetation around the recorded individual also facilitated a highly reliable survey of the footprint, further confirming its limited occurrence within the impact area. However, a species polygon has been developed for this species. This will be submitted with an amended BDAR.

2.6 The proponent needs to provide further details of the adaptive management plan for prescribed impacts to biodiversity values within Kooloonbung Creek.

Due to the uncertainties associated with the projects influence on Kooloonbung Creek, BCS requested that further details be provided within the adaptive management plan for the area.

As part of an amended BDAR, de Witt Ecology will provide greater clarity for the adaptive management plan in relation to hydrological changes, in particular considering Section 8.5 (4-5) of the BAM. The amended BDAR will provide a variety of options to mitigate any indirect or prescribed impacts caused by hydrological changes in Kooloonbung Creek.

3. Response to Relevant Comments from NPWS

The comments from NPSW considered a broad range of disciplines; the responses below directly address comments under the heading "Biodiversity values on NPWS-managed lands" that relate to biodiversity considered under the *Biodiversity Conservation Act 2016*.

3.1 The EIS needs to recognise lands reserved or acquired under the National Parks and Wildlife Act 1974 (NPW Act) in the project area.

A search of the NSW National Parks and Wildlife Service (NPWS) Estate indicated that the project is not located within any lands reserved or acquired under the National Parks and Wildlife Act. The project is approximately 2.2 km from the Innes Ruins Historic Site

Trenching will occur approximately 22 m away from the boundary of the Lake Innes Nature Reserve, separated by Lake Road. Discharge from the project will occur approximately 620 m downstream along Kooloonbung Creek from the Lake Innes Nature Reserve.

4. Response to Relevant Comments from Department of Planning, Housing and Infrastructure

4.1 Detail the proposed rehabilitation that would be outlined within a vegetation management plan.

The BDAR specifically addresses the rehabilitation that is likely to occur within Section 8.10. This includes key monitoring task such as

- Liaise with Friends of Kooloonbung Creek Nature Park
- Assessment of prescribed impact due to water drawdown from the creation of the emergency storage pond (see Figure 60).
- Assessment of Prescribed impact along trenched areas.
- Assessment of PCT 4004 Northern Melaleuca quinquenervia Swamp Forest in Kooloonbung Creek for degradation.
- Assessment of PCT4103 Sporobolus virginicus Saltmarsh in Kooloonbung Creek for degradation and invasion by Mangroves.
- Assessment of threatened flora species records identified in this BDAR.
- Assessment of lands under conservation title for impacts related to HDD.
- Monitoring of amphibian populations within Kooloonbung Creek including aural-visual and tadpole surveys from the discharge point to Gordon Street Bridge.

The key restoration tasks will include,

- Restoration of Koala Feed Trees removed by the project at a ratio of three additional trees for each tree removed. Trees should be monitored and replaced if planting fails.
- Revegetation of SRM & RWM trenches with shallow rooted species. All areas of the SRM & RWM shall be revegetated with shallow rooted species of the PCT mapped in the area by this BDAR. Where exotic vegetation is indicated in this BDAR, the restoration may be with suitable native species of a local PCT or suitable exotic species that are not listed on the High Threat Weed list ((NSW DPE, 2022) as per Dorrough, Oliver and Wall (2018)).
- Revegetation of Construction Compound locations shall be performed with the full component of species from relevant PCTs that were impacted.
- Land in a 5 m buffer around the Emergency Overflow Swale will be revegetated with native species.

- Monitoring and treatment of exotic species within restoration areas and immediately adjoining areas of impact.
- Replacement of Hollow-bearing Trees. Hollows will ideally be replaced with suitable nesting boxes, salvaged hollows or artificial hollows.
- Utilise any cut material suitable for Koala feeding by donating foliage to a Koala Hospital or local Koala preservation groups;

Additional information will be defined in full as part of the Construction Environmental Management Plan.

In general, the vegetation management plan will detail the following,

- Specific locations where types of vegetation management and rehabilitation will occur
- Fencing
- Erosion and sediment control
- Vegetation clearing and civil works supervision
- Specific flora species mixes used for rehabilitation that are suitable for use around the pipelines and infrastructure
- The soil preparation methods
- Restoration approach
- Weed management methods
- A timeline for works ensuring that the plan is performed for a minimum of 5 years.
- Monitoring process and regularity

4.2 Any proposal to fund a biodiversity conservation action

The project will not directly fund a conservation action. Rather, we understand PMHC will seek to purchase credits to offset impacts from the proposal, which will support biodiversity conservation measures in other locations.

4.3 Confirm if a biodiversity stewardship agreement is required, and if so, provide the draft details of the agreement.

A biodiversity stewardship agreement is not required for this project and the proponent has confirmed that they will not be entering into a biodiversity stewardship agreement to support this project. We understand that PMHC will elaborate further on this matter.

4.4 Justify why and how works are proposed to be undertaken within the identified biodiversity stewardship site to the east of the airport

Works were initially proposed to occur within an access tracks within the BioBanking site as this would reduce impacts to native vegetation. However, following further advice the project has been revised such that it remains completely within the Biocertified lands when in proximity to the Port Macquarie Airport. See Figure 3 for further details.

a) The original proposed design (red lines) outside Biocertified lands (green polygon). This avoided unnecessary vegetation removal

b) The revised project design remains within the Biocertified land and does not intersect the Stewardship land.

Figure 3. Change in footprint alignment to remain entirely within the Biodiversity Certified land.

4.5 Confirm if the project will impact on National Parks, or other sites protected for ecological reasons.

All areas of the project occur outside of the National Parks. Trenching will occur approximately 22 m away from the boundary of the Lake Innes Nature Reserve, separated by Lake Road. Discharge from the project will occur in Kooloonbung Creek approximately 620 m downstream from the Lake Innes Nature Reserve. The project is approximately 2.2 km from the Innes Ruins Historic Site

Sincerely,
de Witt Ecology

Robert Scanlon
Senior Ecologist

C-7 Affected properties

Table C.2 Thrumster Impacts

Project Component	Lot and DP	Property Address	Name and Freehold Status	Land Zoning	Land Use	Impact
WWTP	LOT: 10 DP: 1089078	555 Fernbank Creek Road FERNBANK CREEK	Standard Lot / FREEHOLD	RU1 - Primary Production	2.1.0 Grazing native vegetation	WWTP
	LOT: 13 DP: 1139180	Fernbank Creek Road FERNBANK CREEK	Standard Lot / FREEHOLD	RU1 - Primary Production	2.1.0 Grazing native vegetation	WWTP
					3.2.0 Grazing modified pastures	WWTP
	LOT: 14 DP: 1139180	433 Fernbank Creek Road FERNBANK CREEK	Standard Lot / FREEHOLD	RU1 - Primary Production	2.1.0 Grazing native vegetation	WWTP
					3.2.0 Grazing modified pastures	WWTP
Power	LOT: 1 DP: 1087368	Thrumster Street THRUMSTER	Standard Lot / FREEHOLD	C2 - Environmental Conservation	1.3.3 Residual native cover	Power - HDD
				C3 - Environmental Management	1.3.3 Residual native cover	Power - HDD
					2.1.0 Grazing native vegetation	Power - Trenching
				R1 - General Residential	1.3.3 Residual native cover	Power - Trenching
	LOT: 103 DP: 1127168	Tuffins Lane PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	2.1.0 Grazing native vegetation	Power - Trenching
					5.5.3 Recreation and culture	Power - Trenching
	LOT: 104 DP: 1173567	Tuffins Lane PORT MACQUARIE	Standard Lot / LOCAL GOVERNMENT AUTHORITY	SP2 Air Transport Facility - Infrastructure	5.5.2 Public services	Power - Trenching
	LOT: 121 DP: 1156615	124 Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	2.1.0 Grazing native vegetation	Power - Trenching
					5.5.3 Recreation and culture	Power - Trenching
	LOT: 14 DP: 1139180	433 Fernbank Creek Road FERNBANK CREEK	Standard Lot / FREEHOLD	C2 - Environmental Conservation	1.3.3 Residual native cover	Power - HDD
						Power - Trenching
					2.1.0 Grazing native vegetation	Power - HDD
					6.5.0 Marsh/wetland	Power - HDD
				RU1 - Primary Production	3.2.0 Grazing modified pastures	Power - HDD
	LOT: 2 DP: 1172154	Thrumster Street THRUMSTER	Standard Lot / FREEHOLD	R1 - General Residential	2.1.0 Grazing native vegetation	Power - Trenching
	LOT: 238 DP: 754434	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	C2 - Environmental Conservation	1.3.3 Residual native cover	Power - Trenching
				SP2 Air Transport Facility - Infrastructure	1.3.3 Residual native cover	Power - Trenching
					5.7.1 Airports/aerodromes	Power - Trenching
	LOT: 239 DP: 754434	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	1.3.3 Residual native cover	Power - Trenching
					5.7.1 Airports/aerodromes	Power - Trenching
	LOT: 25 DP: 1123026	99 Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	1.3.3 Residual native cover	Power - Trenching
					2.1.0 Grazing native vegetation	Power - Trenching

Project Component	Lot and DP	Property Address	Name and Freehold Status	Land Zoning	Land Use	Impact
					5.5.3 Recreation and culture	Power - Trenching
					5.7.1 Airports/aerodromes	Power - Trenching
					5.7.2 Roads	Power - Trenching
	LOT: 4 DP: 115306	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	5.7.1 Airports/aerodromes	Power - Trenching
Recycled Water	LOT: 1 DP: 1087368	Thrumster Street THRUMSTER	Standard Lot / FREEHOLD	C2 - Environmental Conservation	1.3.3 Residual native cover	Recycled Water - HDD
				C3 - Environmental Management	1.3.3 Residual native cover	Recycled Water - HDD
				R1 - General Residential	2.1.0 Grazing native vegetation	Recycled Water - Trenching
	LOT: 14 DP: 1139180	433 Fernbank Creek Road FERNBANK CREEK	Standard Lot / FREEHOLD	C2 - Environmental Conservation	1.3.3 Residual native cover	Recycled Water - HDD
					2.1.0 Grazing native vegetation	Recycled Water - HDD
					6.5.0 Marsh/wetland	Recycled Water - HDD
				RU1 - Primary Production	3.2.0 Grazing modified pastures	Recycled Water - HDD
Return Effluent to Kooloonbung Creek	LOT: 1 DP: 242345	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	5.7.1 Airports/aerodromes	Return Effluent to Kooloonbung Creek - Trenching
					5.7.2 Roads	Return Effluent to Kooloonbung Creek - Trenching
	LOT: 10 DP: 264201	Acacia Avenue PORT MACQUARIE	Standard Lot / FREEHOLD	C2 - Environmental Conservation	5.5.1 Commercial services	Return Effluent to Kooloonbung Creek - HDD
	LOT: 103 DP: 1127168	Tuffins Lane PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	2.1.0 Grazing native vegetation	Return Effluent to Kooloonbung Creek - HDD
	LOT: 104 DP: 754434	Hastings River Drive FERNBANK CREEK	Standard Lot / FREEHOLD	C2 - Environmental Conservation	6.5.0 Marsh/wetland	Return Effluent to Kooloonbung Creek - HDD
	LOT: 14 DP: 1139180	433 Fernbank Creek Road FERNBANK CREEK	Standard Lot / FREEHOLD	C2 - Environmental Conservation	2.1.0 Grazing native vegetation	Return Effluent to Kooloonbung Creek - HDD
					6.3.0 River	Return Effluent to Kooloonbung Creek - HDD
					6.5.0 Marsh/wetland	Return Effluent to Kooloonbung Creek - HDD
				RU1 - Primary Production	3.2.0 Grazing modified pastures	Return Effluent to Kooloonbung Creek - HDD
					6.5.0 Marsh/wetland	Return Effluent to Kooloonbung Creek - HDD
	LOT: 17 DP: 263203	33 Lady Nelson Drive PORT MACQUARIE	Standard Lot / FREEHOLD	R1 - General Residential	5.4.1 Urban residential	Return Effluent to Kooloonbung Creek - Trenching
	LOT: 2 DP: 1025083	Lady Nelson Drive PORT MACQUARIE	Standard Lot / LOCAL GOVERNMENT AUTHORITY	C2 - Environmental Conservation	6.5.0 Marsh/wetland	Return Effluent to Kooloonbung Creek - Trenching
	LOT: 2 DP: 547484	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	5.7.1 Airports/aerodromes	Return Effluent to Kooloonbung Creek - Trenching
	LOT: 203 DP: 754434	Tuffins Lane PORT MACQUARIE	Standard Lot / FREEHOLD	C2 - Environmental Conservation	5.5.3 Recreation and culture	Return Effluent to Kooloonbung Creek - HDD
					5.7.1 Airports/aerodromes	Return Effluent to Kooloonbung Creek - HDD
					6.5.0 Marsh/wetland	Return Effluent to Kooloonbung Creek - HDD
				RU1 - Primary Production	5.5.3 Recreation and culture	Return Effluent to Kooloonbung Creek - HDD
					5.7.1 Airports/aerodromes	Return Effluent to Kooloonbung Creek - HDD
	LOT: 239 DP: 754434	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	C2 - Environmental Conservation	6.5.0 Marsh/wetland	Return Effluent to Kooloonbung Creek - HDD

Project Component	Lot and DP	Property Address	Name and Freehold Status	Land Zoning	Land Use	Impact
	LOT: 25 DP: 1123026	99 Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	C2 - Environmental Conservation	5.7.1 Airports/aerodromes	Return Effluent to Kooloonbung Creek - HDD
					6.5.0 Marsh/wetland	Return Effluent to Kooloonbung Creek - Trenching
				SP2 Air Transport Facility - Infrastructure	2.1.0 Grazing native vegetation	Return Effluent to Kooloonbung Creek - HDD
					5.7.1 Airports/aerodromes	Return Effluent to Kooloonbung Creek - HDD
				SP4 - Enterprise	5.7.1 Airports/aerodromes	Return Effluent to Kooloonbung Creek - Trenching
					6.5.0 Marsh/wetland	Return Effluent to Kooloonbung Creek - Trenching
	LOT: 30 DP: 263203	Lady Nelson Drive PORT MACQUARIE	Standard Lot / FREEHOLD	RE1 - Public Recreation	5.4.1 Urban residential	Return Effluent to Kooloonbung Creek - Trenching
					6.5.0 Marsh/wetland	Return Effluent to Kooloonbung Creek - Trenching
	LOT: 6 DP: 790668	283 Oxley Highway PORT MACQUARIE	Standard Lot / CROWN	R1 - General Residential	5.4.1 Urban residential	Return Effluent to Kooloonbung Creek - Trenching
					5.5.3 Recreation and culture	Return Effluent to Kooloonbung Creek - Trenching
				RE2 - Private Recreation	5.5.3 Recreation and culture	Return Effluent to Kooloonbung Creek - HDD
						Return Effluent to Kooloonbung Creek - Trenching
					5.7.2 Roads	Return Effluent to Kooloonbung Creek - Trenching
	LOT: 7030 DP: 1029359	Lake Road PORT MACQUARIE	Standard Lot / CROWN	SP2 Sewerage System - Infrastructure	5.5.1 Commercial services	Return Effluent to Kooloonbung Creek - Trenching
					5.9.5 Sewage/sewerage	Return Effluent to Kooloonbung Creek - Trenching
	LOT: 7307 DP: 1154392 RES: 210029	Lake Road PORT MACQUARIE	Standard Lot / CROWN	SP2 Sewerage System - Infrastructure	5.9.5 Sewage/sewerage	Return Effluent to Kooloonbung Creek - Trenching
	LOT: 89 DP: 785605	35 Lady Nelson Drive PORT MACQUARIE	Standard Lot / FREEHOLD	R1 - General Residential	5.4.1 Urban residential	Return Effluent to Kooloonbung Creek - Trenching
Sewer Diversion from Southwestern Pump Stations	LOT: 1 DP: 242345	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	5.7.1 Airports/aerodromes	Sewer Diversion from Southwestern Pump Stations - Trenching
					5.7.2 Roads	Sewer Diversion from Southwestern Pump Stations - Trenching
	LOT: 1 DP: 772163	John Oxley Drive PORT MACQUARIE	Standard Lot / FREEHOLD	RU1 - Primary Production	2.1.0 Grazing native vegetation	Sewer Diversion from Southwestern Pump Stations - Trenching
	LOT: 10 DP: 1088869	John Oxley Drive PORT MACQUARIE	Standard Lot / FREEHOLD	RU1 - Primary Production	2.1.0 Grazing native vegetation	Sewer Diversion from Southwestern Pump Stations - Trenching
	LOT: 103 DP: 1127168	Tuffins Lane PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	2.1.0 Grazing native vegetation	Sewer Diversion from Southwestern Pump Stations - Trenching
	LOT: 104 DP: 1173567	Tuffins Lane PORT MACQUARIE	Standard Lot / LOCAL GOVERNMENT AUTHORITY	SP2 Air Transport Facility - Infrastructure	5.5.2 Public services	Sewer Diversion from Southwestern Pump Stations - Trenching
	LOT: 121 DP: 1156615	124 Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	2.1.0 Grazing native vegetation	Sewer Diversion from Southwestern Pump Stations - Trenching
	LOT: 2 DP: 1025083	Lady Nelson Drive PORT MACQUARIE	Standard Lot / LOCAL GOVERNMENT AUTHORITY	C2 - Environmental Conservation	6.5.0 Marsh/wetland	Sewer Diversion from Southwestern Pump Stations - Trenching
	LOT: 2 DP: 547484	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	5.7.1 Airports/aerodromes	Sewer Diversion from Southwestern Pump Stations - Trenching
	LOT: 25 DP: 1123026	99 Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	C2 - Environmental Conservation	6.5.0 Marsh/wetland	Sewer Diversion from Southwestern Pump Stations - Trenching

Project Component	Lot and DP	Property Address	Name and Freehold Status	Land Zoning	Land Use	Impact
				SP4 - Enterprise	5.7.1 Airports/aerodromes	Sewer Diversion from Southwestern Pump Stations - Trenching
					6.5.0 Marsh/wetland	Sewer Diversion from Southwestern Pump Stations - Trenching
	LOT: 30 DP: 263203	Lady Nelson Drive PORT MACQUARIE	Standard Lot / FREEHOLD	RE1 - Public Recreation	5.4.1 Urban residential	Sewer Diversion from Southwestern Pump Stations - Trenching
					6.5.0 Marsh/wetland	Sewer Diversion from Southwestern Pump Stations - Trenching
	LOT: 6 DP: 790668	283 Oxley Highway PORT MACQUARIE	Standard Lot / CROWN	RE2 - Private Recreation	5.5.3 Recreation and culture	Sewer Diversion from Southwestern Pump Stations - Trenching
					5.7.2 Roads	Sewer Diversion from Southwestern Pump Stations - Trenching
	LOT: 653 DP: 43940	15 Tulloch Road PORT MACQUARIE	Standard Lot / CROWN	RE2 - Private Recreation	5.5.3 Recreation and culture	Sewer Diversion from Southwestern Pump Stations - Trenching
	LOT: 678 DP: 722658	Tulloch Road PORT MACQUARIE	Standard Lot / CROWN	RE2 - Private Recreation	5.5.3 Recreation and culture	Sewer Diversion from Southwestern Pump Stations - Trenching
					5.7.2 Roads	Sewer Diversion from Southwestern Pump Stations - Trenching
Sewer Diversion from SPS 7	LOT: 1 DP: 242345	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	5.7.1 Airports/aerodromes	Sewer Diversion from SPS 7 - Trenching
	LOT: 12 DP: 867928	67 Hastings River Drive PORT MACQUARIE	Standard Lot / FREEHOLD	E3 - Productivity Support	5.5.0 Services	Sewer Diversion from SPS 7 - Trenching
					5.7.2 Roads	Sewer Diversion from SPS 7 - Trenching
	LOT: 2 DP: 547484	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	5.7.1 Airports/aerodromes	Sewer Diversion from SPS 7 - Trenching
	LOT: 220 DP: 216093	Hastings River Drive PORT MACQUARIE	Standard Lot / FREEHOLD	R1 - General Residential	5.7.2 Roads	Sewer Diversion from SPS 7 - Trenching
	LOT: 25 DP: 1123026	99 Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	C2 - Environmental Conservation	5.7.2 Roads	Sewer Diversion from SPS 7 - Trenching
					6.5.0 Marsh/wetland	Sewer Diversion from SPS 7 - Trenching
				SP4 - Enterprise	5.7.1 Airports/aerodromes	Sewer Diversion from SPS 7 - Trenching
					6.5.0 Marsh/wetland	Sewer Diversion from SPS 7 - Trenching
Sewer Gravity SPS54	LOT: 1 DP: 772163	John Oxley Drive PORT MACQUARIE	Standard Lot / FREEHOLD	RU1 - Primary Production	2.1.0 Grazing native vegetation	Sewer Gravity SPS54 - Trenching
	LOT: 10 DP: 1088869	John Oxley Drive PORT MACQUARIE	Standard Lot / FREEHOLD	RU1 - Primary Production	2.1.0 Grazing native vegetation	Sewer Gravity SPS54 - Trenching
					5.7.2 Roads	Sewer Gravity SPS54 - Trenching
	LOT: 2 DP: 234501	4 Major Innes Road PORT MACQUARIE	Standard Lot / FREEHOLD	R1 - General Residential	5.4.1 Urban residential	Sewer Gravity SPS54 - Trenching
Sewer Rising Main	LOT: 1 DP: 808448	Hastings River Drive PORT MACQUARIE	Standard Lot / FREEHOLD	R1 - General Residential	5.5.3 Recreation and culture	Sewer Rising Main - Trenching
	LOT: 103 DP: 1127168	Tuffins Lane PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	2.1.0 Grazing native vegetation	Sewer Rising Main - Trenching
					5.5.3 Recreation and culture	Sewer Rising Main - Trenching
	LOT: 104 DP: 1173567	Tuffins Lane PORT MACQUARIE	Standard Lot / LOCAL GOVERNMENT AUTHORITY	SP2 Air Transport Facility - Infrastructure	5.5.2 Public services	Sewer Rising Main - Trenching
	LOT: 12 DP: 874058 RES: 210112	176 Hastings River Drive PORT MACQUARIE	Standard Lot / CROWN	R1 - General Residential	5.5.3 Recreation and culture	Sewer Rising Main - Trenching
	LOT: 121 DP: 1156615	124 Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	2.1.0 Grazing native vegetation	Sewer Rising Main - Trenching
					5.5.2 Public services	Sewer Rising Main - Trenching
					5.5.3 Recreation and culture	Sewer Rising Main - Trenching

Project Component	Lot and DP	Property Address	Name and Freehold Status	Land Zoning	Land Use	Impact
	LOT: 14 DP: 1139180	433 Fernbank Creek Road FERNBANK CREEK	Standard Lot / FREEHOLD	C2 - Environmental Conservation	1.3.3 Residual native cover	Sewer Rising Main - HDD
						Sewer Rising Main - Trenching
					2.1.0 Grazing native vegetation	Sewer Rising Main - HDD
					6.5.0 Marsh/wetland	Sewer Rising Main - HDD
				RU1 - Primary Production	3.2.0 Grazing modified pastures	Sewer Rising Main - HDD
	LOT: 238 DP: 754434	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	C2 - Environmental Conservation	1.3.3 Residual native cover	Sewer Rising Main - Trenching
				SP2 Air Transport Facility - Infrastructure	1.3.3 Residual native cover	Sewer Rising Main - Trenching
					5.7.1 Airports/aerodromes	Sewer Rising Main - Trenching
	LOT: 239 DP: 754434	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	C2 - Environmental Conservation	1.3.3 Residual native cover	Sewer Rising Main - Trenching
				SP2 Air Transport Facility - Infrastructure	1.3.3 Residual native cover	Sewer Rising Main - Trenching
					5.7.1 Airports/aerodromes	Sewer Rising Main - Trenching
	LOT: 25 DP: 1123026	99 Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	2.1.0 Grazing native vegetation	Sewer Rising Main - Trenching
					5.5.3 Recreation and culture	Sewer Rising Main - Trenching
					5.7.1 Airports/aerodromes	Sewer Rising Main - Trenching
	LOT: 4 DP: 115306	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	5.7.1 Airports/aerodromes	Sewer Rising Main - Trenching
Water Main	LOT: 103 DP: 1127168	Tuffins Lane PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	2.1.0 Grazing native vegetation	Water Main - Trenching
					5.5.3 Recreation and culture	Water Main - Trenching
	LOT: 104 DP: 1173567	Tuffins Lane PORT MACQUARIE	Standard Lot / LOCAL GOVERNMENT AUTHORITY	SP2 Air Transport Facility - Infrastructure	5.5.2 Public services	Water Main - Trenching
	LOT: 121 DP: 1156615	124 Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	2.1.0 Grazing native vegetation	Water Main - Trenching
					5.5.3 Recreation and culture	Water Main - Trenching
	LOT: 14 DP: 1139180	433 Fernbank Creek Road FERNBANK CREEK	Standard Lot / FREEHOLD	C2 - Environmental Conservation	1.3.3 Residual native cover	Water Main - HDD
						Water Main - Trenching
					2.1.0 Grazing native vegetation	Water Main - HDD
					6.5.0 Marsh/wetland	Water Main - HDD
				RU1 - Primary Production	3.2.0 Grazing modified pastures	Water Main - HDD
	LOT: 238 DP: 754434	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	C2 - Environmental Conservation	1.3.3 Residual native cover	Water Main - Trenching
				SP2 Air Transport Facility - Infrastructure	1.3.3 Residual native cover	Water Main - Trenching
					5.7.1 Airports/aerodromes	Water Main - Trenching
	LOT: 239 DP: 754434	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	1.3.3 Residual native cover	Water Main - Trenching
					5.7.1 Airports/aerodromes	Water Main - Trenching

Project Component	Lot and DP	Property Address	Name and Freehold Status	Land Zoning	Land Use	Impact
	LOT: 25 DP: 1123026	99 Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	1.3.3 Residual native cover	Water Main - Trenching
					2.1.0 Grazing native vegetation	Water Main - Trenching
					5.5.3 Recreation and culture	Water Main - Trenching
					5.7.1 Airports/aerodromes	Water Main - Trenching
	LOT: 4 DP: 115306	Boundary Street PORT MACQUARIE	Standard Lot / FREEHOLD	SP2 Air Transport Facility - Infrastructure	5.7.1 Airports/aerodromes	Water Main - Trenching

C-8 Correspondence with Asteroid Mining Australia

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Port Macquarie
NSW Australia 2444
e council@pmhc.nsw.gov.au
ABN 11 236 901 601

PORT MACQUARIE
HASTINGS COUNCIL

20 February 2025

The Director
[redacted]

Dear Director

Exploration Licence EL9666 - Intersection with the Thrumster Wastewater Scheme

I am writing to inform you about the planned construction of the Thrumster Wastewater Scheme by Port Macquarie-Hastings Council, which will cater for the growth in the Thrumster and Sancrox areas.

The Environmental Impact Statement (EIS) for the scheme has been submitted to the NSW Department of Planning, Housing and Infrastructure (DPHI), Council are currently preparing a response to the submissions report. Further information on this State Significant Infrastructure can be found on the Department of Planning and Environment's Major Projects Portal via the following website https://www.planningportal.nsw.gov.au/major-projects/projects/thrumster-wastewater-scheme.

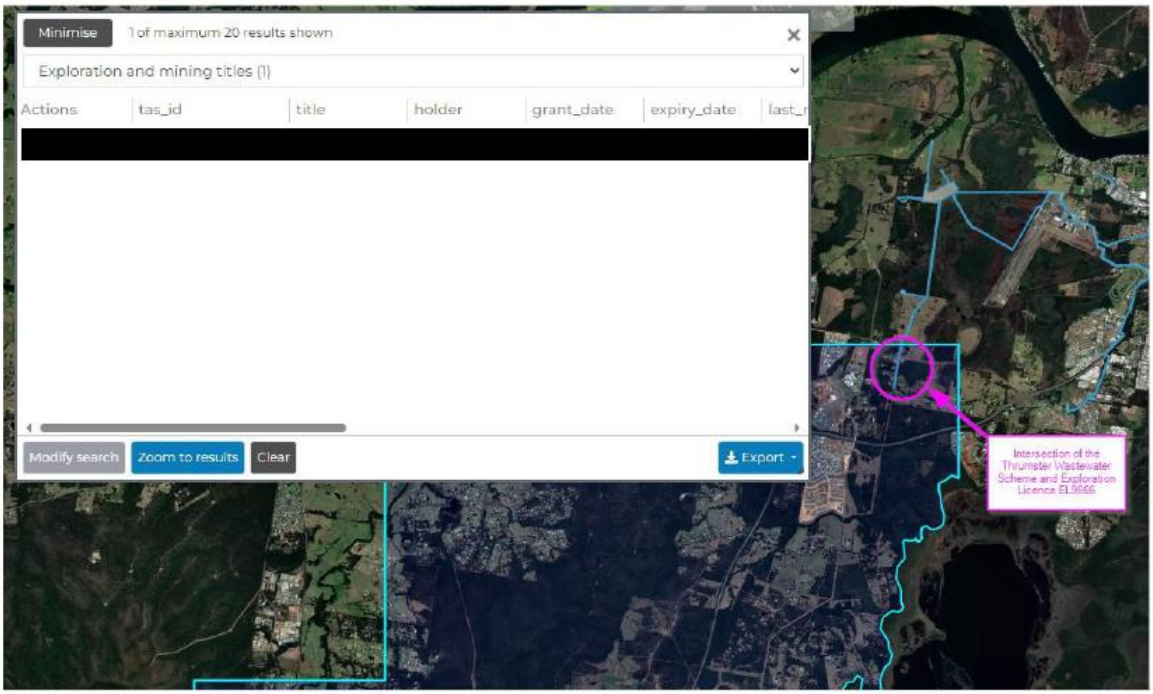
A submission received in response to the EIS from NSW Resources has identified that the footprint of the Thrumster Wastewater Scheme intersects with Exploration Licence EL9666, which was granted to [redacted] on 25 June 2024. We have attached a map showing the overall project footprint and the EL9666 licence area for your reference.

Please review and advise if you have any feedback or comments regarding the intersection of the Thrumster Wastewater Scheme and exploration licence EL9666 footprints, including if any fieldwork in this area is planned by [redacted] so we can further liaise on timing of the construction works for our pipelines.

Feel free to contact Council's Project Manager Cameron Sales at 0408 818 443 or cameron.sales@pmhc.nsw.gov.au if you have any questions or concerns.

Yours sincerely

Cameron Hawkins
Group Manager Utilities Planning & Design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Intersection of the Thrumster Wastewater Scheme and Exploration Licence EL9666

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