

Appendix J

Surface Water Assessment



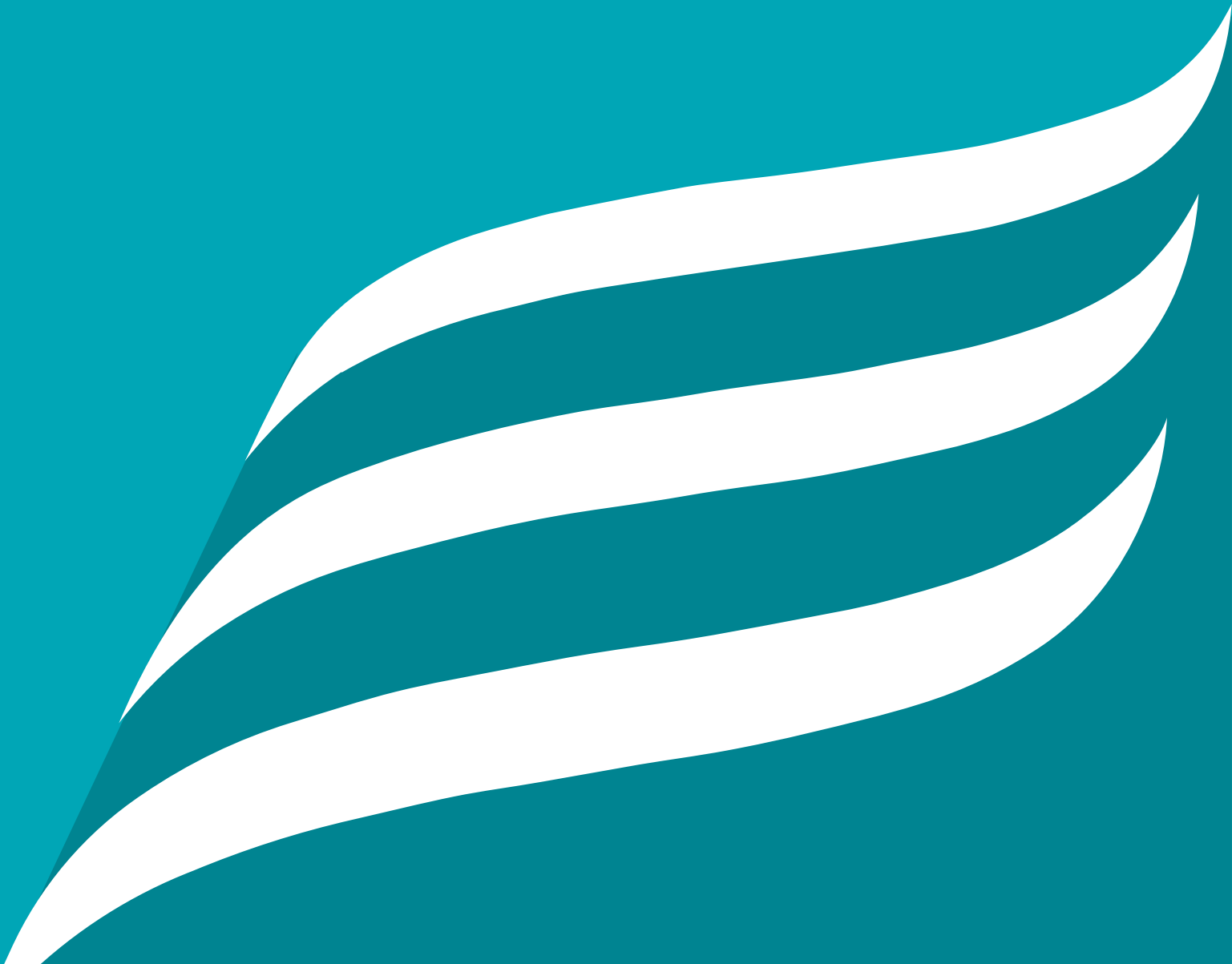
SUPAGAS PTY LTD

Supagas CO2 Plant

Surface Water Assessment

BNTL00400_0006-REP-001-1

22 MAY 2026



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1. INTRODUCTION

1.1 Overview

Supagas Pty Ltd (the Applicant) proposes to develop and operate a carbon dioxide (CO₂) plant (the Project), which would connect to the adjacent Wilga Park Power Station (WPPS) (also known as the Santos Wilga Power Station).

The Project is designated development and requires approval under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Engeny Australia Pty Ltd (Engeny) has been engaged by Onward Consulting Pty Ltd (Onward) on behalf of the Applicant prepare a Surface Water Assessment (SWA) as part of the Environmental Impact Statement (EIS) for the Project.

1.2 Project Description

The Project involves the construction and operation of a CO₂ plant, which would capture and process exhaust gases from the WPPS gas generators to produce a CO₂ product of food grade quality for export and use in the food, beverage, and other markets. The Project would produce approximately 72 tonnes per day (tpd) of liquid CO₂, with allowance for storage of approximately 800 tonnes (t) of liquid CO₂ prior to delivery off site. The Project layout is shown on Figure 1.1.

The Project area covers approximately 3 ha and will be located wholly within Lot 12 of DP 1171292 in the Narrabri Local Government Area (LGA), approximately 12 km south-west of Narrabri, NSW.

The Project activities will include:

- Subdivision of the Project area from Lot 12 of DP 1171292.
- Clearing and earthworks for site preparation and to enable construction.
- Construction of the Project, including:
 - Temporary compound facilities to support construction activities.
 - Equipment and structures to enable operation of the CO₂ plant.
 - Power connection to the WPPS electrical network.
- Operation of the Project, including export of the CO₂ product via road transport.
- Decommissioning, rehabilitation, and closure.

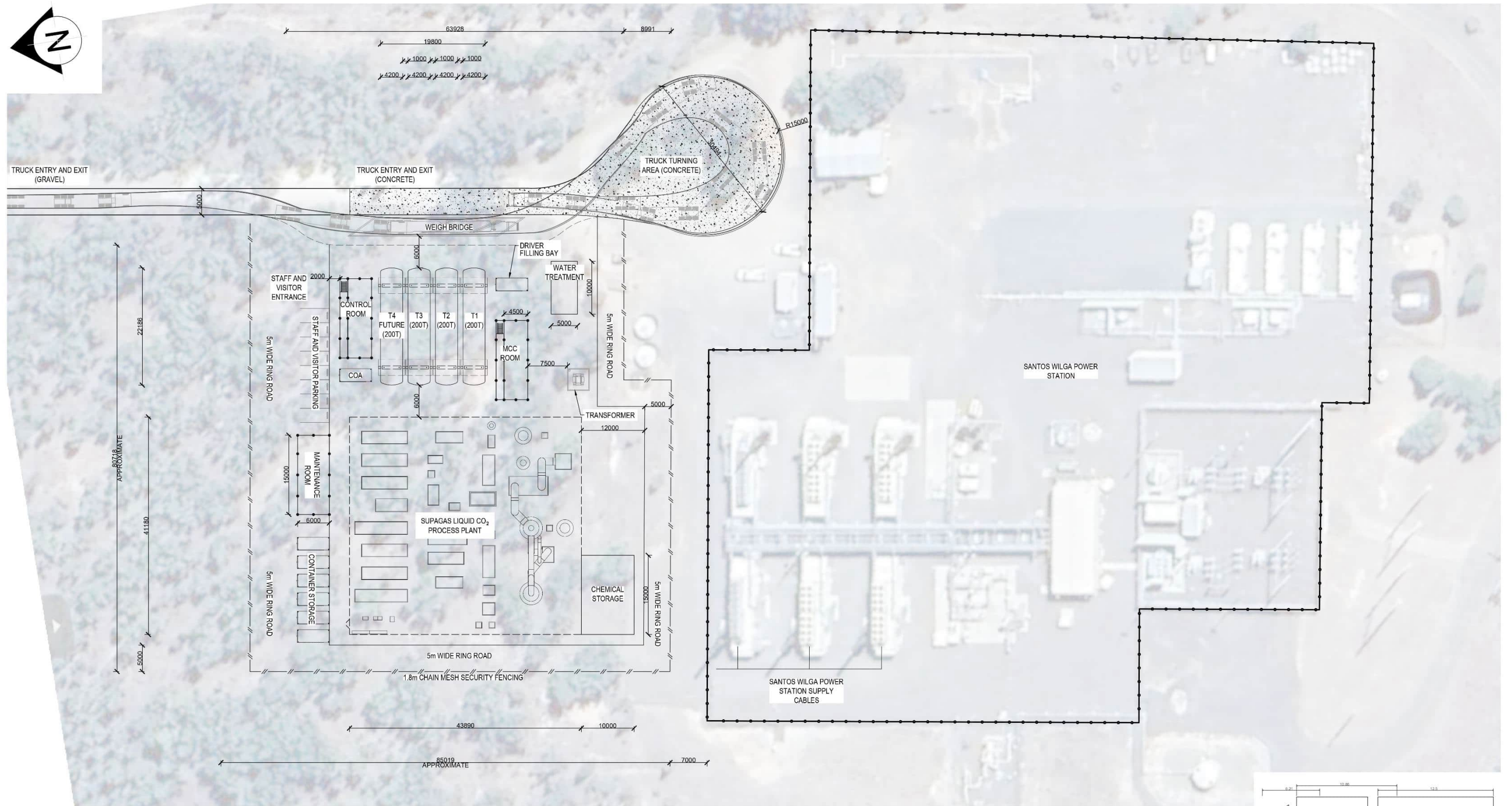


FIGURE 1.1: SITE LOCATION - PLAN

1.3 SEARs and Agency Advice

The relevant Planning Secretary's Environmental Assessment Requirements (SEARs), including where each is addressed in this report, are listed in Table 1.1. Agency submissions to SEARs related to surface water were received from the NSW Environment Protection Authority (EPA) and the former Biodiversity, Conservation and Science Group (BCS) (now Conservation Programs, Heritage and Regulation (CPHR) group) of the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) and are summarised in Table 1.2

TABLE 1.1: SEARS AND WHERE ADDRESSED

SEAR	Issue	Section Addressed in this Report
<i>Soil and Water</i>	a description of local soils, topography, drainage and landscapes	Section 2
	details of water usage for the proposal including existing and proposed water licencing requirements in accordance with the <i>Water Act 1912</i> and/or the <i>Water Management Act 2000</i>	Section 3.4
	an assessment of potential impacts on floodplain and stormwater management and any impact to flooding in the catchment	Section 4.3
	details of sediment and erosion controls	Section 3.2
	a detailed site water balance	Section 3.4
	an assessment in accordance with ASSMAC Guidelines for the presence and extent of acid sulfate soils (ASS) and potential acid sulfate soils (PASS) on the site and, where relevant, appropriate mitigation measures	Addressed by others
	an assessment of potential impacts on the quality and quantity of surface and groundwater resources	Section 4
	details of the proposed stormwater and wastewater management systems (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts	Section 5
	a description and appraisal of impact mitigation and monitoring measures.	Section 5.2

TABLE 1.2: RELEVANT REGULATORY SUBMISSION TO SEARS AND WHERE ADDRESSED

Agency	Reference and Issue	Section Addressed in this Report
<i>EPA - Water</i>	The EIS surface water quality assessment must: 7.1. Demonstrate that all practical measures to prevent, control, abate or mitigate water pollution have been implemented, including a description of options that were explored (such as reuse to avoid a discharge or treatment).	Section 5
	7.2. Provide details of the proposal that are essential for predicting and assessing potential impacts to receiving waters. This could include (but is not limited to): a. Site layout, including details of the existing and proposed water management system. b. Drainage map for the entire site identifying sub-catchments, flow paths, drainage infrastructure, design sizing of structures, water storages, discharge points, and any potential flow paths to receiving waters. c. How stormwater will be managed in all phases of the project. Information should include, where appropriate, measures to avoid or minimise erosion, leachate generation, and sediment mobilisation at the site. d. Any in-water activities (such as piling or dredging).	Section 3

Agency	Reference and Issue	Section Addressed in this Report
	7.3. Include water balance(s) for ground and surface water, including any intake and discharge locations, volumes, frequency, and duration.	Section 3.4
	7.4. Identify and estimate the quality and quantity of all pollutants that may be introduced into the water cycle by source and discharge point, including residual discharges after mitigation measures are implemented. This should be undertaken for construction and operational phases.	Section 4.2 and 3.4.1
	7.5. Include a water pollution impact assessment undertaken consistent with the guidance available at https://www.epa.nsw.gov.au/your-environment/water/managing-water-pollutionin-nsw/environment-protection-licensing/water-pollution-discharge-assessments . The level of assessment should be commensurate with the risk to the environment and human health.	Section 4.2.1
	7.6. Describe any surface water quality monitoring programs, including proposed monitoring locations, frequency, and indicators of surface water quality. Analytical limits of reporting should have regard to any identified guideline values. Water quality monitoring should be undertaken in accordance with the <i>Approved Methods for the Sampling and Analysis of Water Pollutants in NSW</i> (2004) available at: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/water/22p3488-approved-methods-for-water-inns.pdf .	Section 5.1
	7.7. The EIS must describe how stormwater will be managed in all phases of the project, including details of how stormwater and runoff will be managed to minimise pollution. Information should include measures to be implemented to minimise erosion, leachate, and sediment mobilisation at the site. The EIS should consider the guidelines <i>Managing urban stormwater: soils and construction</i> , vol. 1 (Landcom 2004) and vol. 2 (A. Installation of services; C. Unsealed roads; D. Main Roads; E. Mines and quarries) (DECC, 2008).	Section 3
BCS- Water	The EIS must map features relevant to water, including: • Rivers, streams, estuaries (as described in s4.2 of the Biodiversity Assessment Method) • Wetlands (as described in s4.2 of the Biodiversity Assessment Method) o • Groundwater • Groundwater dependent ecosystems.	Section 2
	The EIS must describe background conditions for any water resource likely to be affected by the proposal, including: • Existing surface and groundwater • Hydrology • Water Quality Objectives (as endorsed by the NSW Government) including groundwater as appropriate that represent the community's uses and values for the receiving waters. Indicators and trigger values/criteria for the identified environmental values in accordance with the ANZECC (2000) <i>Guidelines for Fresh and Marine Water Quality</i> and / or local objectives, criteria or targets endorsed by the NSW Government • <i>Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions</i> (OEH/EPA, 2017).	Section 2
	The EIS must assess the impacts of the proposal on water quality, including: • The nature and degree of impact on receiving waters for both surface and groundwater, demonstrating how the proposal protects the Water Quality Objectives where they are currently being achieved, and contributes towards achievement of the Water Quality Objectives over time where they are currently not being achieved. This should include an assessment of the mitigating effects of proposed stormwater and wastewater management during and after construction. • Identification of proposed monitoring of water quality. • Consistency with any relevant certified Coastal Management Program (or Coastal Zone Management Plan).	Section 4.2 and 5.1

Agency	Reference and Issue	Section Addressed in this Report
	The EIS must assess the impact of the proposal on hydrology, including: • Water balance including quantity, quality and source. • Effects upon rivers, wetlands, estuaries, marine waters and floodplain areas. • Effects upon water-dependent fauna and flora including groundwater dependent ecosystems. • Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (e.g. river benches) • Changes to environmental water availability, both regulated / licensed and unregulated / rules-based sources of such water.	Section 4
BCS - Flooding	The EIS must map the following features relevant to flooding as described in the Flood Risk Management Manual (NSW Government 2023) including: • Flood prone land (ie land susceptible to the probable maximum flood event). • Flood planning area, the area below the flood planning level. • Hydraulic categorisation (floodway and flood storage areas). • Flood hazard. The EIS must describe flood assessment and modelling undertaken in determining the design flood levels for events, including a minimum of the 10% Annual Exceedance Probability (AEP), 1% AEP flood levels and the probable maximum flood, or an equivalent extreme event. The EIS must model the effect of the proposal (including fill) on the current flood behaviour for a range of design events as identified above, and the 0.5% AEP and 0.2% AEP year flood events as proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change. All site drainage, stormwater quality devices and erosion / sedimentation control measures should be identified in the EIS and the onsite treatment of stormwater and effluent runoff and predicted stormwater discharge quality from the proposal should be detailed. Modelling in the EIS must consider and document: • Existing council flood studies in the area and examine consistency to the flood behaviour documented in these studies. • The impact on existing flood behaviour for a full range of flood events including up to the probable maximum flood (PMF), or an equivalent extreme flood. • Impacts of the proposal on flood behaviour resulting in detrimental changes in potential flood affection of other developments or land. This may include redirection of flow, flow velocities, flood levels, hazard categories and hydraulic categories. • Impacts of earthworks and stockpiles within the flood prone land up to the PMF level. The assessment should be based on understanding of cumulative flood impacts of construction and operational phases. • Relevant provisions of the Flood Risk Management Manual 2023 The EIS must assess the impacts on the proposal on flood behaviour, including: • Whether there will be detrimental increases in the potential flood affection of other properties, assets and infrastructure. • Consistency with Council floodplain risk management plans. • Consistency with any Rural Floodplain Management Plans. • Compatibility with the flood hazard of the land. • Compatibility with the hydraulic functions of flow conveyance in floodways and storage in flood storage areas of the land. • Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site.	Section 4.3

Agency	Reference and Issue	Section Addressed in this Report
	• Whether there will be a direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses. • Appropriate mitigation measures to offset potential flood risk arising from the proposal. Any proposed mitigation work should be modelled and assessed on the overall catchment basis in order to ensure it fits its purpose and meets the criteria of the Council where it is located, and to ensure it has no adverse impact to surrounding areas. • Any impacts the proposal may have upon existing community emergency management arrangements for flooding. These matters are to be discussed with the NSW SES and Council. • Whether the proposal incorporates specific measures to manage risk to life from flood. These matters are to be discussed with the NSW SES and Council. • Emergency management, evacuation and access, and contingency measures for the proposal during both construction and operational phases considering the full range of flood risk (based upon the probable maximum flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of Council and the NSW SES. • Any impacts the proposal may have on the social and economic costs to the community as a consequence of flooding.	

1.4 Potential Surface Water Impacts

The Project has the potential to have the following impacts on surface water resources:

- Potential adverse water quality impacts on downstream receiving waters during all phases of the Project (construction, operation and closure) as a consequence of:
 - Erosion and transport of sediment from exposed surfaces in stormwater discharges to the surrounding environment.
 - Other pollutants such as solvents, Monoethanolamine (MEA) and hydrocarbons (e.g. fuel/oil leaks or spills) entrained in stormwater discharges to the surrounding environment.
 - Application of poor quality water for dust suppression.
 - Application of Reverse Osmosis (RO) concentrate water for irrigation.
 - Uncontrolled discharge of wastewater or effluent from the Project.
- Minor change in runoff and flow regimes to the surrounding catchment as a result of:
 - Increased impervious areas within the Project area.
 - Runoff from the Project Water Management System (WMS) bunded areas being retained by the Project.

Potential surface water impacts have been assessed in subsequent sections of this report.

2. BASELINE CHARACTERISTICS

2.1 Climate

The Project is located in the North West Slopes and Plains of NSW which is characterised by a subtropical climate. Rainfall varies seasonally with periods of higher rainfall expected during summer.

The Bureau of Meteorology (BoM) operates the following stations in proximity to the Project:

- Narrabri (Mollee) Station 53026 – Approximately 11 km from the Project with rainfall data from 1926 to 2025.
- Narrabri Airport AWS Station 54038 – Approximately 16 km from the Project with rainfall data from 2001 to 2025.
- Turrawan (Wallah) Station 55058 – Approximately 28 km from the Project with rainfall data from 1910 to 2025.

Climate data for the Project was sourced from the Synthetic Information for Landholders (SILO) database. The SILO database provides interpolated raw rainfall and evaporation data from gauges managed by the BoM to provide spatially and temporarily complete datasets for site specific locations. Rainfall and evaporation (Morton's shallow lake evaporation) data was sourced for the SILO grid point closest to the Project (-30.35 latitude and 149.70 longitude), for the period between 01/01/1889 to 24/06/2025. There are only minor variations in average monthly rainfall between the nearby BoM rainfall stations and the SILO data, indicating that the SILO dataset is suitable to be used to represent long-term rainfall data for the Project.

Annual rainfall and Morton's shallow lake evaporation statistics are tabulated in Table 2.1. Daily average rainfall and evaporation depth for Project are presented in Figure 2.1 and monthly rainfall and evaporation depth ranges are shown in Figure 2.2 and Figure 2.3.

The average annual rainfall depth for the Project location is 631 mm. The average annual evaporation (1,594 mm) is over two times greater than annual average rainfall. Average monthly rainfall totals indicate that the wettest months are between December and February in the summer months and that less rainfall typically occurs throughout winter.

TABLE 2.1: ANNUAL RAINFALL AND EVAPORATION STATISTICS (SILO, 2025)

Statistic	Annual Rainfall Depth (mm)	Annual Morton's Shallow Lake Evaporation Depth (mm)
10 th Percentile	405	1,530
50 th Percentile	641	1,587
90 th Percentile	854	1,685
Average	631	1,594

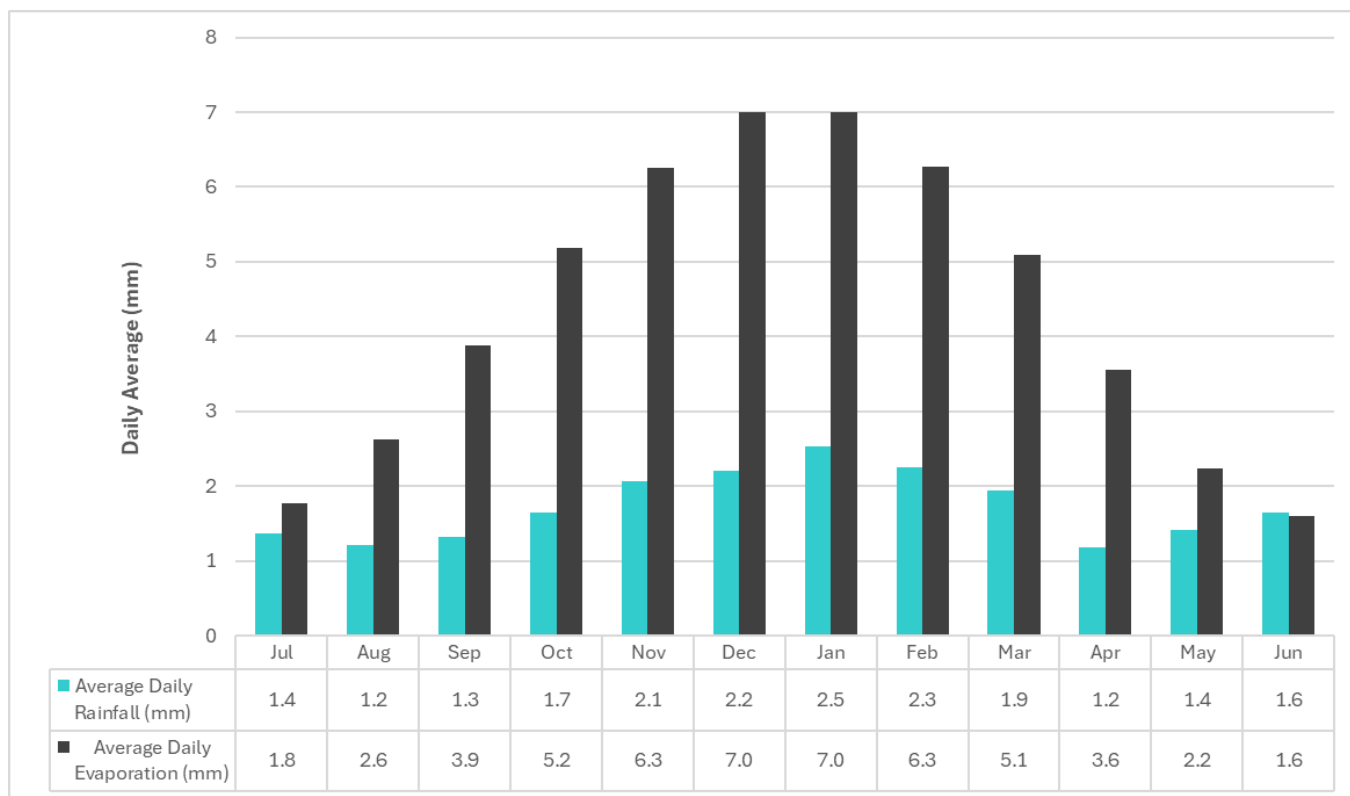


Figure 2.1: Daily Average Rainfall and Evaporation 1889 – 2025 (Source: SILO, 2025)

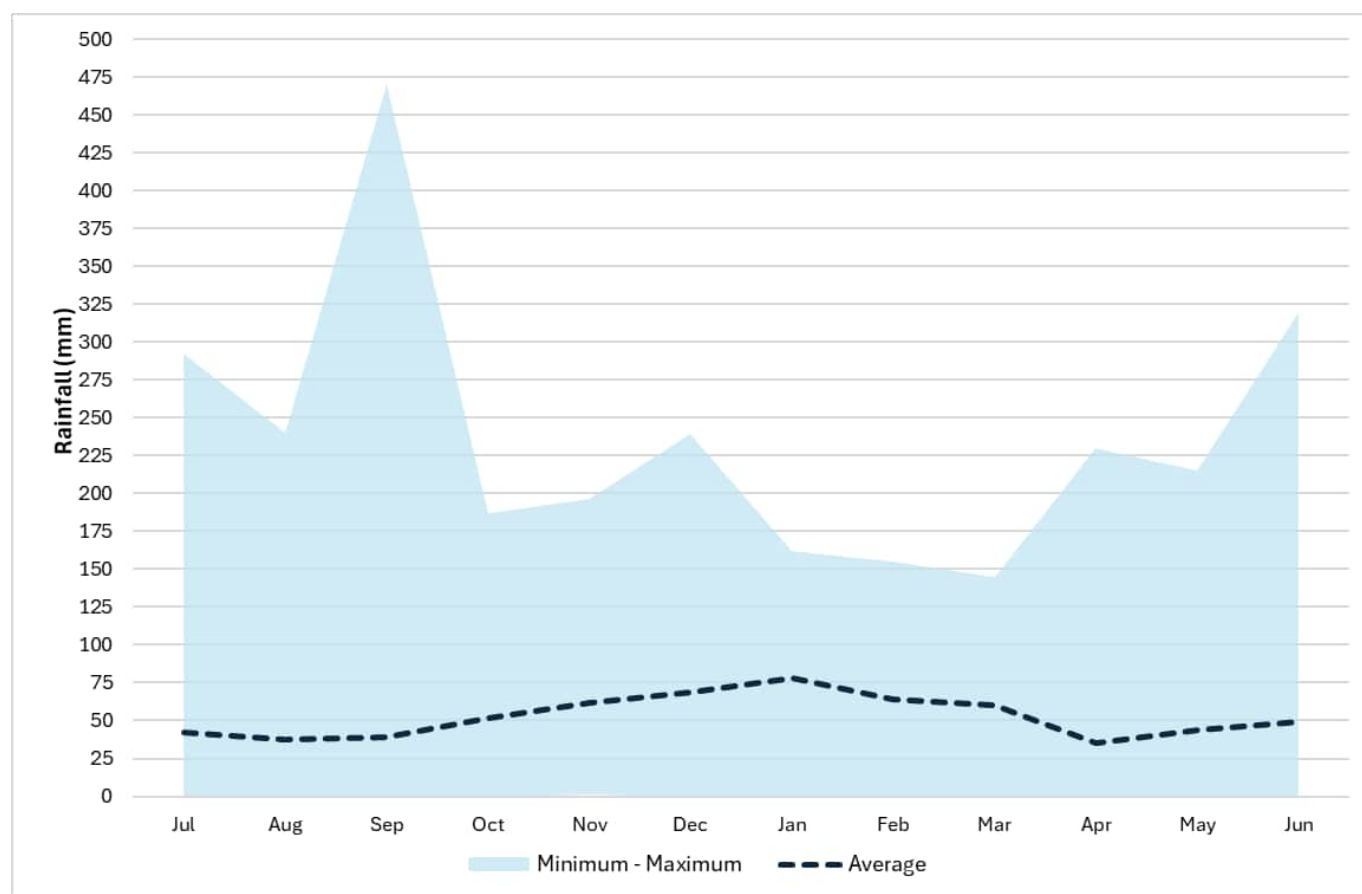


Figure 2.2: Monthly Rainfall Average and Range (Source: SILO, 2025)

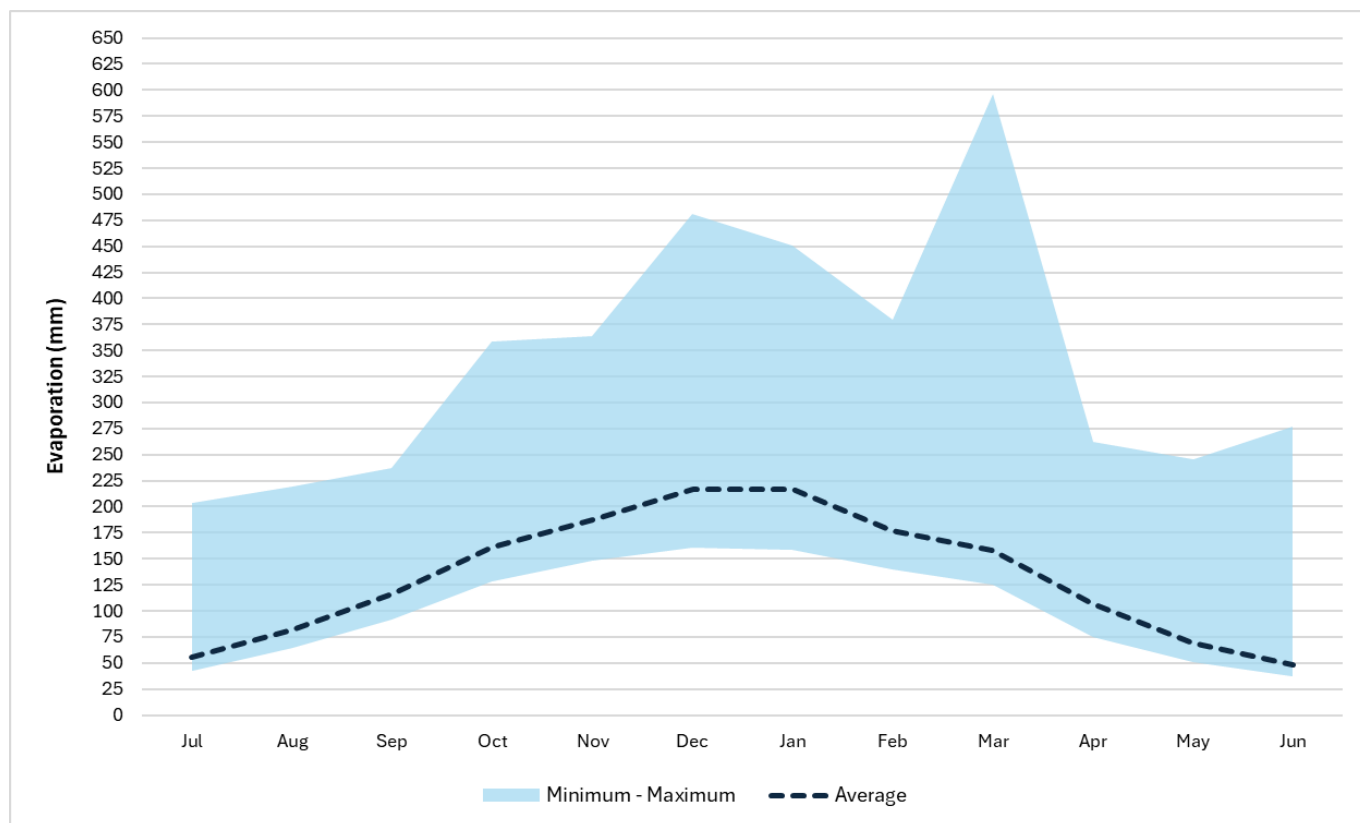


Figure 2.3: Monthly Evaporation Average and Range (Source: SILO, 2025)

2.2 Surface Water Context

2.2.1 Regional Systems

The Project is located within the Namoi River Catchment that covers an area of approximately 42,000 km². The Namoi River flows to the west from the Great Dividing Range near Tamworth, passing through towns such as Gunnedah and Narrabri, before joining the Barwon River near Walgett, NSW. Major tributaries of the Namoi River include Bohena Creek, Coxs Creek, Mooki River, and Peel River. There are no major water storages from river systems in this region (NSW Government Water, 2023).

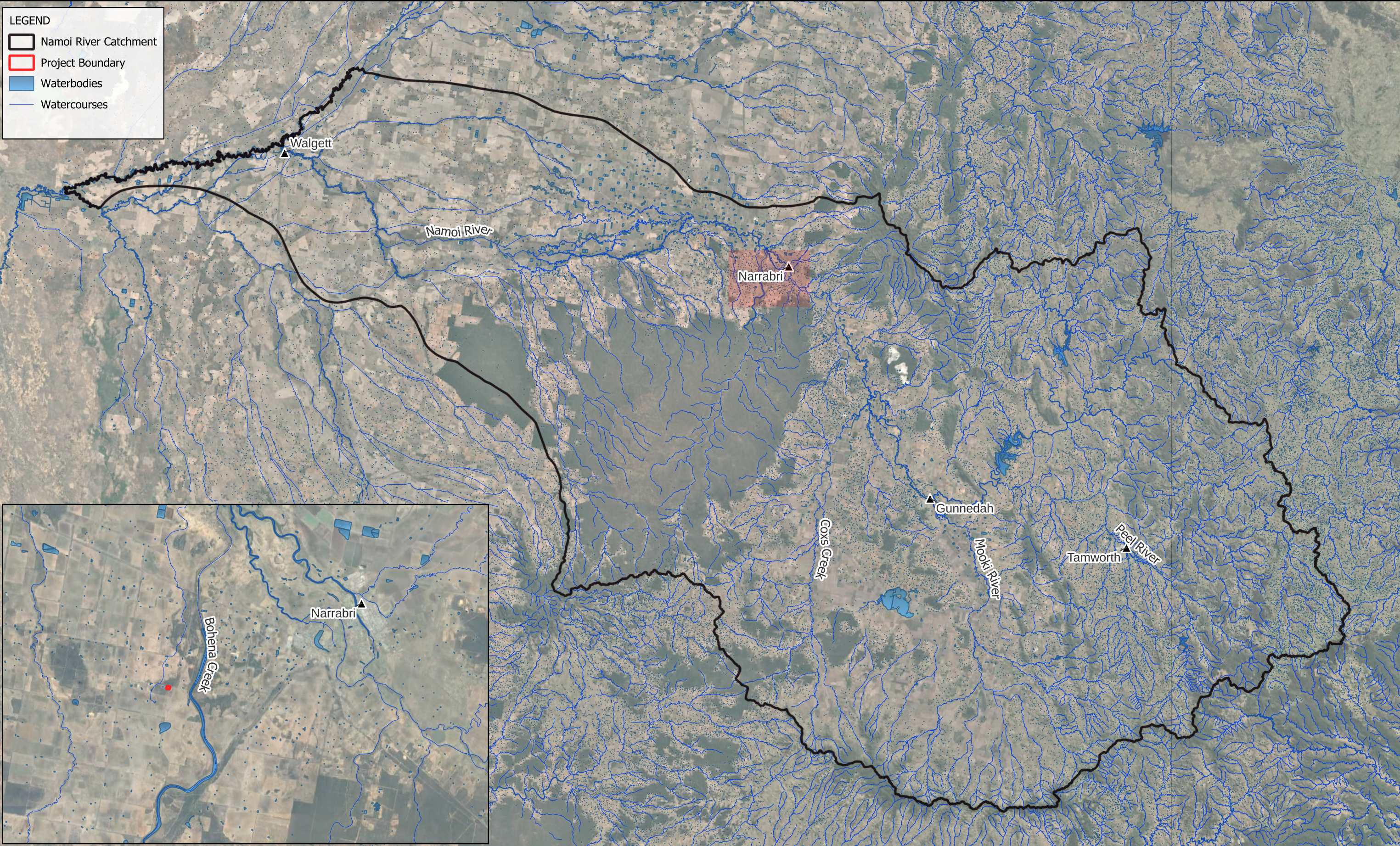
An overview of the Project area and its proximity to key regional drainage features is provided in Figure 2.4.

2.2.2 Local Systems

There is minor variation in surface level elevations within the Project area, sitting at approximately 224 mAHD (refer to Figure 2.5). The topography is generally flat, with minor elevation rises associated with the adjacent WPPS and existing roads. Surrounding the Project area, the catchment generally flows to the northwest.

Bohena Creek is located approximately 1 km east of the Project. Bohena Creek flows north and joins the Namoi River approximately 12 km downstream from the Project. Pig Creek, located around 400 m west of the Project, also flows into the Namoi River, joining approximately 3 km further downstream than Bohena Creek. Additionally, an unnamed watercourse originates from an agricultural dam located about 800 m north of the Project.

No minor or non-minor Strahler classification drainage lines are mapped within the Project.



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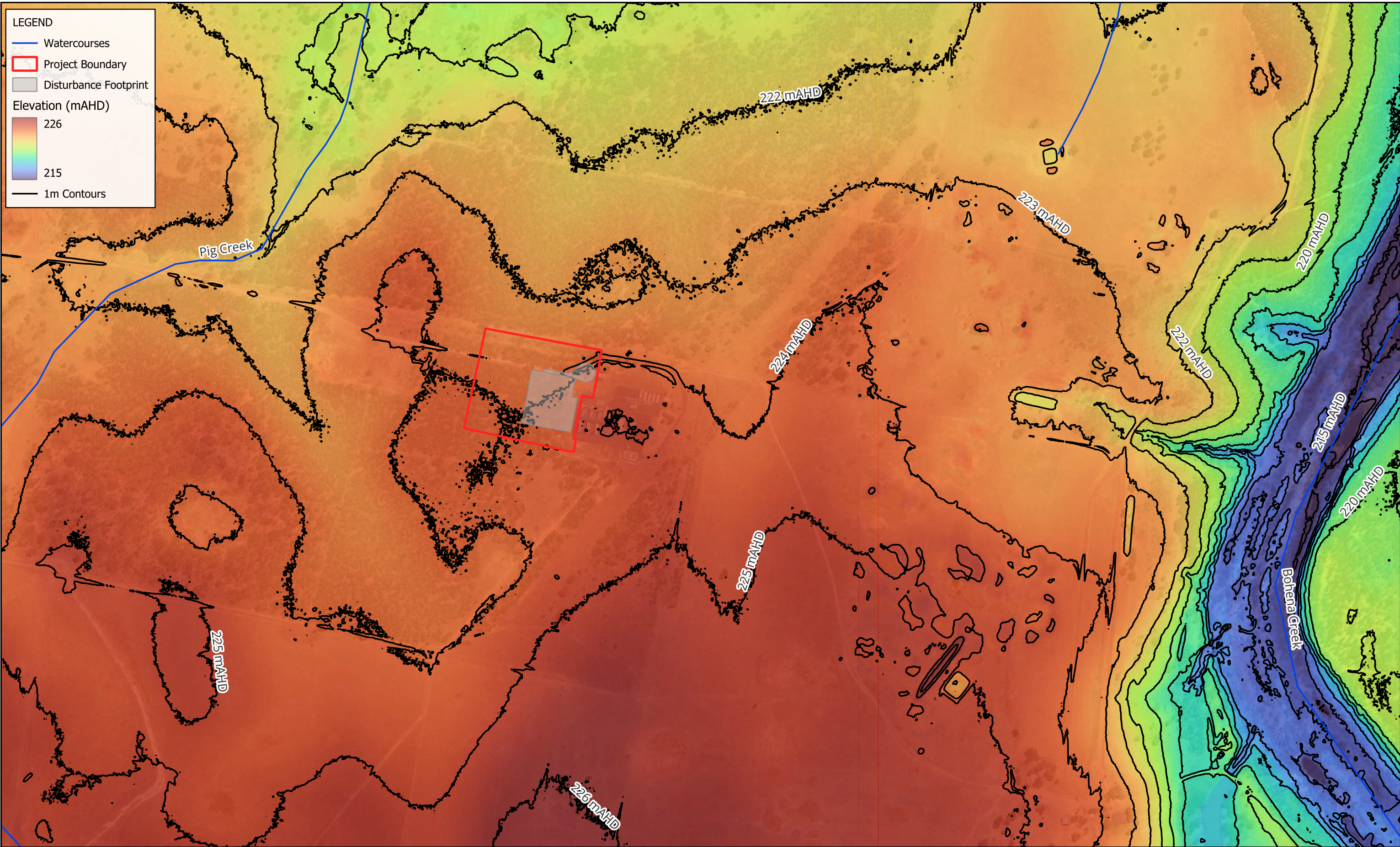
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia
Vertical Datum: Australia Height Datum
Grid: Map Grid of Australia, Zone 55

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Figure 2.4: Regional Drainage Overview

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Revision: 0
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Checked: LV
Date: 14 /8 /2025



LEGEND

- Watercourses
- Project Boundary
- Disturbance Footprint
- Elevation (mAHd)
 - 226
 - 215
- 1m Contours

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Scale in metres (1:5,500 @ A3)

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia
Vertical Datum: Australia Height Datum
Grid: Map Grid of Australia, Zone 55

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Figure 2.5: Local Drainage Overview

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Date: 30 /4 /2026

2.3 Water Quality and Flow Regimes

2.3.1 Water Quality and River Flow Objectives

The NSW Water Quality and River Flow Objectives (as published by the Office of Environment and Heritage (OEH)) are the agreed environmental values and long-term goals for NSW surface waters (OEH, 2006). The objectives consist of the NSW Water Quality Objectives (WQOs) and the NSW River Flow Objectives (RFOs), which aim to achieve the right water quality for different land uses and improve environmental results from managing the riverine system. The different Namoi River Basin WQOs and RFOs relevant to the Project are detailed in Sections 2.3.1.1 and 2.3.1.2.

2.3.1.1 Water Quality Objectives

The NSW WQOs are consistent with the agreed national framework for assessing water quality as set out in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Governments and Australian state and territory governments, 2018) (ANZG 2018). It is noted that ANZG 2018 still references Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Environment and Conservation Council, 2000) (ANZECC 2000) in relation to a range of water quality aspects including regional physical and chemical stressors and primary industries (e.g. irrigation, livestock drinking supply).

Table 2.2 present the WQOs considered most applicable to the Project with respect to the receiving environment Environmental Values and potential pollutants in offsite discharges. It is noted that the physical and chemical stressor WQOs for aquatic ecosystems presented in Table 2.2 are for upland river systems (>150 m AHD and <1,500 mAHD) in south eastern Australia, given the Project area is at an elevation of around 224 mAHD.

TABLE 2.2: RELEVANT NSW WATER QUALITY OBJECTIVES – NAMOI RIVER CATCHMENT

Objective	Indicator	Guideline Value – Upland River	Applicability to the Project
Aquatic Ecosystems - <i>Maintaining or improving the ecological condition of waterbodies and their riparian zones over the long term.</i>	Total phosphorus (TP)	20 µg/L	Low Relevance –There are no ephemeral and perennial drainage lines in close proximity to the Project that the potential to have aquatic ecosystems.
	Total nitrogen (TN)	250 µg/L	
	Chlorophyll-a	Upland rivers: not applicable	
	Turbidity	2 – 25 NTU	
	Salinity (electrical conductivity) (EC)	30 – 350 µS/cm	
	Dissolved Oxygen	90 – 110%	
	pH	6.5 – 8.0	
Visual amenity - <i>Aesthetic qualities of waters</i>	Visual Clarity and colour	Natural visual clarity should not be reduced by more than 20%. Natural hue of the water should not be changed by more than 10 points on the Munsell Scale. The natural reflectance of the water should not be changed by more than 50%.	Low Relevance – The Project proposes to use hazardous materials during processing, which will be contained and appropriately disposed of to minimise risk of offsite spills. The Project area does not contain any ephemeral or perennial drainage lines.
	Surface films and debris	Oils and petrochemicals should not be noticeable as a visible film on the water, nor should they be detectable by odour. Waters should be free from floating debris and litter.	
	Nuisance organisms	Macrophytes, phytoplankton scums, filamentous algal mats, blue-green algae, sewage fungus and leeches should not be present in unsightly amounts.	

Objective	Indicator	Guideline Value – Upland River	Applicability to the Project
Livestock water supply - <i>Protecting water quality to maximise the production of healthy livestock</i>	Algae & blue-green algae	An increasing risk to livestock health is likely when cell counts of microcystins exceed 11 500 cells/mL and/or concentrations of microcystins exceed 2.3 µg/L expressed as microcystin-LR toxicity equivalents.	Moderate Relevance - The Project and surrounding area is close to water storages associated with agriculture and domestic purposes.
	Salinity (electrical conductivity)	Recommended concentrations of total dissolved solids in drinking water for livestock are given in Table 4.3.1 (ANZECC 2000 Guidelines).	
	Thermotolerant coliforms (faecal coliforms)	Drinking water for livestock should contain less than 100 thermotolerant coliforms per 100 mL (median value).	
	Chemical contaminants	Refer to Table 4.3.2 (ANZECC 2000 Guidelines) for heavy metals and metalloids in livestock drinking water. Refer to Australian Drinking Water Guidelines (NHMRC and NRMMC 2004) for information regarding pesticides and other organic contaminants, using criteria for raw drinking water.	
Irrigation water supply - <i>Protecting the quality of waters applied to crops and pasture</i>	Algae & blue-green algae	Should not be visible. No more than low algal levels are desired to protect irrigation equipment.	High Relevance - The Project proposes to use RO concentrate water for irrigation where possible, if treated to suitable limits.
	Salinity (electrical conductivity)	To assess the salinity and sodicity of water for irrigation use, a number of interactive factors must be considered including irrigation water quality, soil properties, plant salt tolerance, climate, landscape and water and soil management. For more information, refer to Chapter 4.2.4 of ANZECC 2000 Guidelines.	
	Thermotolerant coliforms (faecal coliforms)	Trigger values for thermotolerant coliforms in irrigation water used for food and non-food crops are provided in Table 4.2.2 of the ANZECC Guidelines	
	Heavy metals and metalloids	Long term trigger values (LTV) and short-term trigger values (STV) for heavy metals and metalloids in irrigation water are presented in Table 4.2.10 of the ANZECC 2000 Guidelines.	
Drinking water • Disinfection Only • Clarification and disinfection • Groundwater <i>Refers to the quality of drinking water drawn from the raw surface and groundwater sources before any treatment</i>	Blue-green algae	Recommend twice weekly inspections during danger period for storages with history of algal blooms. >500 algal cells/mL - increase monitoring. < 2000 algal cells/mL - water may be used for potable supply. >2000 algal cells/mL - immediate action indicated; seek expert advice. >6500 algal cells/mL - seek advice from health authority. >15 000 algal cells/mL - may not be used for potable supply except with full water treatment, which incorporates filtration and activated carbon. Source: Australian Drinking Water Guidelines (NHMRC & NRMMC, 2011).	Moderate Relevance - The Project is not in close proximity to groundwater bores registered for water supply. The Project and surrounding area is close to water storages associated with agriculture and domestic purposes.
	Turbidity	Site-specific determinant.	
	Salinity (electrical conductivity)	<1500 µS/cm > 800 µS/cm causes a deterioration in taste.	

Objective	Indicator	Guideline Value – Upland River	Applicability to the Project
	Faecal coliforms*	0 faecal coliforms per 100 mL (0/100 mL)	
	Total coliforms*	95% of samples should be 0 coliforms/ 100 mL throughout the year. Up to 10 coliform organisms may be accepted occasionally in 100 mL. Coliform organisms should not be detected in 100 mL in any two consecutive samples.	
	Dissolved oxygen	> 6.5 mg/L (> 80% saturation)	
	pH	6.5 – 8.5	
	Chemical contaminants	See ANZECC 2000 guidelines, Section 6.2.2.	

*Not applicable as monitoring of periphyton is recommended in upland rivers in place of phytoplankton biomass.

2.3.1.2 River Flow Objectives

The River Flow Objectives (RFOs) relevant to the Project are summarised in in Table 2.3.

TABLE 2.3: RELEVANT NSW RIVER FLOW OBJECTIVES – MACLEAY RIVER CATCHMENT

Objective	Description	Measures to achieve objective	Applicability to the Project
Protect pools in dry times - Protect natural water levels in pools of creeks and rivers and wetlands during periods of no flows	During dry times, some streams stop flowing and form pools. Pools and wetlands are refuges for aquatic plants and animals. Pumping water from these areas can make it more difficult for many species to recover after a drought.	- There should be no water extraction from streams or wetlands in periods of no flow. - If conditions on water licences do not provide for meeting this objective, priority goes to implementing it by actions appropriate to local circumstances.	Low Relevance – Naomi Catchment experiences fluctuations in rainfall with risk of dry periods, however the Project area contains no ephemeral Creeks in its surrounds.
Protect natural low flows - Protect natural low flows	Water extraction and storage are high in dry times and impose long artificial droughts that increase the stress on aquatic plants and animals.	- Share low flows between the environment and water users and fully protect all very low natural flows. - Very low flows: flows below the level naturally exceeded on 95% of all days with flow. - Low flows: flows below the level naturally exceeded on 80% of all days with flow. - Unless environmental, social and economic evaluations give an appropriate alternative, the following limits on water extraction apply: - Environmental share in high-conservation-value streams: to be all very low flows and most of the low flows. There should be no increase in extraction of low flows.	Low Relevance – the Project has potential to have minor impacts on surface water flows within the Project area. Downstream receiving waters are perennial and any changes to flow as a result of the Project will be negligible

Objective	Description	Measures to achieve objective	Applicability to the Project
		— Environmental share in other streams: all very low flows and 50-70% of daily low levels. • New or transferred licences should not allow extraction during low flows below the 80th percentile. • In streams with little water use or important conservation values, minimise risks to ecosystems during low flows. • Review management of town water supplies to assess whether changes may help achieve the objective without significantly affecting reliability.	
Maintain wetland and floodplain inundation - Maintain or restore the natural inundation patterns and distribution of floodwaters supporting natural wetland and floodplain ecosystems	Floodplain and wetland ecosystems develop in response to flow patterns and the nature of the landscape between the river and wetlands or floodplains. Floodplain works can change the flooding patterns, which will lead to changes in habitat and vegetation. These changes can be expected to reduce or change the diversity and abundance (or both) of species in the ecosystem. In particular, they can lead to reduced numbers of native fish and to water quality problems. In many coastal floodplain areas, drainage works or levees and reduced inundation cause gradual drying of potential acid sulphate soils, release of acid into waterways and serious impacts on downstream ecosystems and fisheries.	• In management plans and actions for waterways, include strategies to: — maintain, restore or mimic natural inundation and drying patterns in natural and semi-natural wetlands and remaining native floodplain ecosystems — ensure adequate access for native fish to and from floodplain wetlands. • Flooding patterns should not be altered without proper environmental assessment.	Low Relevance – The Project has potential to impact surface water flows in downstream watercourses, however due to its size relative to the downstream catchment, impacts to flows would be negligible.
Minimise effects of weirs and other structures - Minimise the impact of instream structures	Most instream structures (e.g. weirs) convert flowing water to still water, thus altering habitat and increasing the risk of algal blooms or other water quality problems. Barriers restrict passage of plant propagules (e.g. seeds) and animals. This can be a major problem for species which depend on upstream and downstream migration during at particular times in their lifecycle.	• Implement the NSW Weirs Policy (DLWC 1997b). • Identify and take action to reduce the impacts on fish, other animals, plants and water quality of other structures (e.g. floodgates, tidal barriers, culverts) that impede the two-way movement of water in streams	Low Relevance - The Project area does not contain any watercourses.
Manage groundwater for ecosystems - Maintain groundwater within natural levels and variability, critical to	Some shallow groundwaters are directly linked to flows in streams and wetlands. They may provide base flows in rivers during dry periods and may be primary sources of water for wetland, floodplain	• Implement the State Groundwater Policy (DLWC 1997a, 1998b). • Identify any streams or ecosystems that may depend on high groundwater levels and assess impacts of reduced recharge or excessive pumping.	Low Relevance - the Project is located upon gently sloped topography. The Project has potential to have minor impacts on surface water flows within the Project. Downstream

Objective	Description	Measures to achieve objective	Applicability to the Project
<i>surface flows and ecosystems</i>	and riparian vegetation. Seriously depleting groundwater in dry times may lead to unnatural recharge of groundwater from surface waters during the next flow.	- Identify where groundwaters may be rising and likely to threaten ecosystems or surface water quality. - Determine appropriate action to keep groundwater level changes within acceptable bounds.	receiving waters are perennial and highly regulated and any changes to flow as a result of the Project will be negligible

2.3.2 Regional Surface Water Quality

2.3.2.1 Narrabri Gas Project Environmental Impact Statement

Baseline water quality within the region was established for the Narrabri Gas Project Environmental Impact Statement (Santos, 2016), including for the Namoi River and Bohena Creek, which indicated:

- The water quality of the Namoi River ranges from fresh to very slightly brackish, with:
 - Average electrical conductivity concentrations around 400 $\mu\text{S}/\text{cm}$.
 - Average total dissolved solids concentrations around 250 mg/L.
 - Average pH of 7.8.
- The water quality of Bohena Creek is generally fresh, with:
 - Average electrical conductivity concentrations around 216 $\mu\text{S}/\text{cm}$.
 - Average total dissolved solids concentrations around 200 mg/L.
 - Average pH of 7.1.

2.3.2.2 Water Quality Index

The DCCEEW publishes annual state-wide water quality reports incorporating monitored water quality at nearly 200 sites on a monthly basis within the major rivers and streams of NSW. This data is used to understand long-term trends in water quality throughout NSW and to develop Water Quality Index (WaqI) scores. An annual report is produced for every major river and its tributaries.

The Namoi Valley annual surface water quality report: 2023–2024 (DCCEEW, 2025) provides an overview of existing surface water quality within the Namoi catchment, based on monthly data collected from 11 sites within the region. The closest monitoring site to the Project area was Station Number 419003 on Narrabri Creek at Narrabri. The WaQI classification for this site was ‘moderate’, with a rating of 68 out of 100.

2.3.2.3 NSW River Styles Framework

The River Styles Framework (Macquarie University, 2025) is an approach to geomorphologically informed river management. It guides the description of river morphology, interpretation of behaviour, assessment of condition, prediction of river recovery potential and prioritisation of river management. NSW River Styles mapping is used to identify rare and threatened river forms across the state.

Key watercourses surrounding the Project area have been classified according to the NSW River Styles Framework. These classifications are summarised in Table 2.4 and indicate that the catchment surrounding the Project is characterised by geomorphic conditions ranging from ‘moderate’ to ‘poor’. This suggests existing disturbance within the watercourses, which may contribute to lower water quality and ecological function.

TABLE 2.4: NSW RIVER STYLES CLASSIFICATIONS

Watercourse	River Style	Geomorphic stream condition	Potential to recover from its current condition	Priority for river management
Pig Creek	Laterally unconfined, discontinuous channel, floodout, fine-grained	Poor	Moderate recovery potential	Strategic
Namoi River	Laterally unconfined, continuous channel, low sinuosity, gravel bed	Moderate	High recovery potential	High priority rehabilitation
Bohena Creek	Laterally unconfined, discontinuous channel, chain of ponds, fine-grained/sand/gravel	Moderate	High recovery potential	High priority rehabilitation

2.3.2.4 River Condition Index

The NSW River Condition Index (RCI) is the primary long term reporting tool for assessing riverine condition. It is used to combine a range of indicators into a single condition score. The indicators include riparian vegetation, geomorphic condition, hydrologic stress, biodiversity, catchment disturbance and water quality.

The RCI was developed using the Framework for the Assessment of River and Wetland Health (FARWH) approach, which is an accepted Australian wide approach. The FARWH method uses existing data collection activities across Australia and converts them into a standardised and nationally comparable representation of river health.

Under the RCI, the Project is located in the Namoi Catchment (bordering Catchment ID: 117 and 121) with an overall RCI classifications of 'good' to 'very good'. The sub catchment covering most of the Project area has a Water Quality Sub Index classification of 'moderate'.

2.3.3 Local Surface Water and Groundwater Quality

Santos undertakes ongoing surface water and groundwater quality sampling as part of the Narrabri Gas Project and publishes the results on the online Santos Water Portal. There are several surface water and groundwater quality monitoring locations within proximity (~10 km) to the Project, as shown on Figure 2.6.

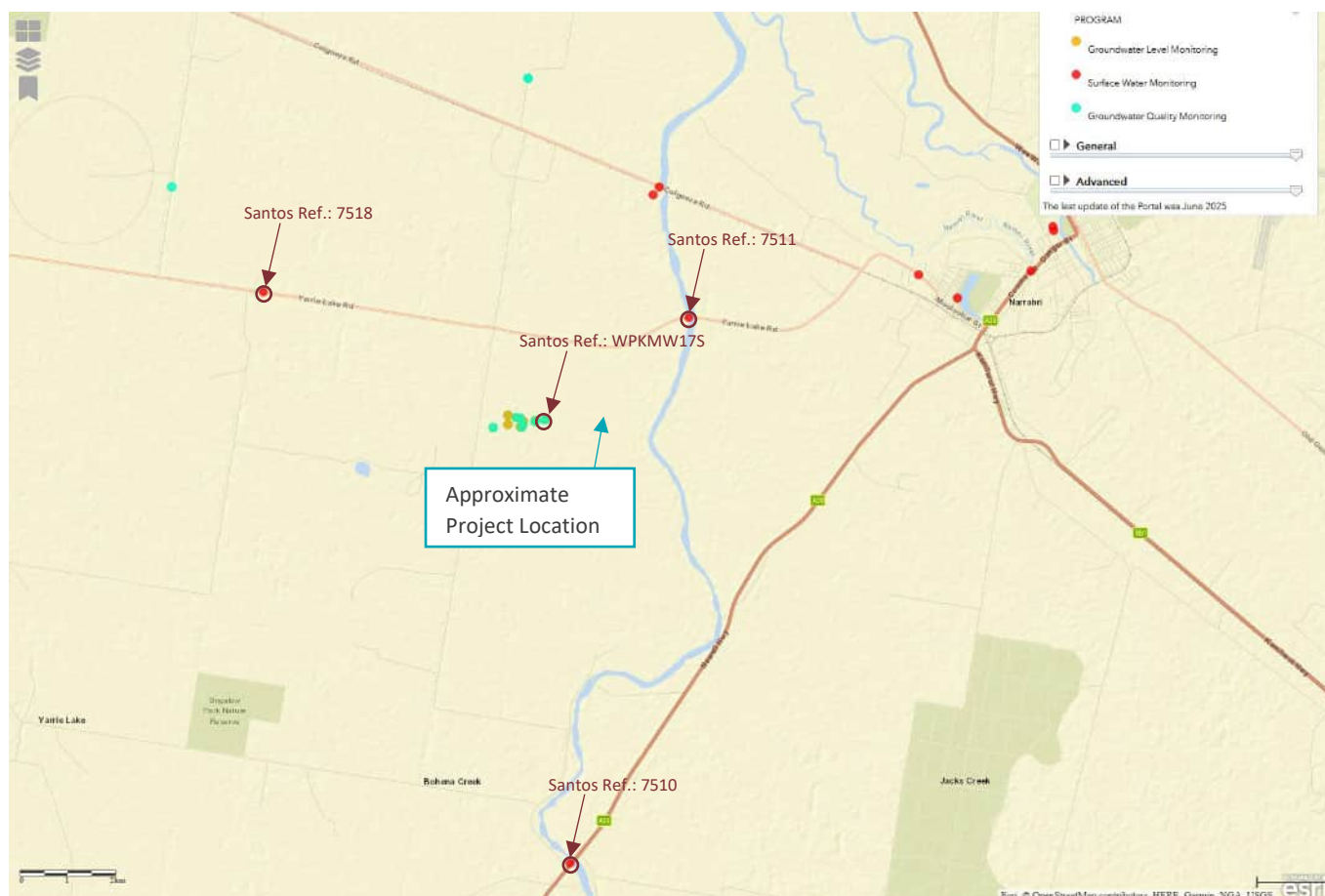


FIGURE 2.6: WATER QUALITY MONITORING LOCATIONS (SOURCE: SANTOS WATER PORTAL: (<https://map.santoswaterportal.com.au>))

A summary of surface water and groundwater quality near the Project is included in Table 2.5.

TABLE 2.5: BASELINE WATER QUALITY RESULTS

Santos Reference	Description	Latest Sample Date	pH	Electrical Conductivity (µS/cm)	Total Dissolved Solids (TDS) (mg/L)
WPKMW17S	Groundwater Quality Monitoring ~1 km from Project	June 2020	8	3,005	1,370
7510 (Bohena Creek crossing Newell Highway)	Surface Water Monitoring ~9 km from Project (upstream)	May 2023	7	126	167
7511 (Bohena Creek at Yarrie Lake Road culvert)	Surface Water Monitoring ~3 km from Project (downstream)	April 2024	6	447	397
7518 (Mollee Creek at Yarrie Lake Road)	Surface Water Monitoring ~7 km from Project (downstream)	September 2015	8	203	132

2.4 Soils

The Project area and surrounds consist of Sodosols. Sodosols are characterised by a distinct texture contrast between the topsoil and subsoil, with a strongly sodic, dispersive B horizon that often impedes water movement and root growth.

Publicly available modelled soil properties and hydrogeological landscape data (DCCEEW, 2022) relevant to the Project was sourced from the 'Sharing and Enabling Environmental Data in NSW' (SEED) Portal. The modelled soil properties and hydrogeological landscape data (DCCEEW, 2022) is tabulated in Table 2.6 and Table 2.7. Table 2.6 indicates that the Project area has:

- Moderately to highly erodible (topsoil and subsoil).
- Coarse to fine textured topsoil and fine textured subsoil.
- Slightly acidic topsoil and generally neutral subsoil.
- Low to moderately fertile topsoil and subsoil.

TABLE 2.6: MODELLED SOIL PROPERTIES

Parameter	Soil Profile		
	0 – 30 cm Depth	30 – 60 cm Depth	60 – 100 cm Depth
Soil Erodibility, k factor (as used in the Revised Universal Soil Loss Equation (RUSLE))	0.04 - 0.06	0.04 - 0.06	0.04 - 0.06
Clay Percentage (%)	>15 - 20	>30 - 40	>30 - 40
Silt Percentage (%)	<5 - 10	>5 - 10	>5 - 10
Sand Percentage (%)	>85	>80 - 85	>60 - 70
pH (CaCl ₂)	>5.5 - 6	>6 - 7	>6.5 - 7
Cation Exchange Capacity (cmolc/kg)	>10 - 15	>10 - 15	>15 - 20
Soil Organic Carbon Concentration (%)	>0.5 - 1	>0.25 - 0.5	≤0.25

TABLE 2.7: HYDROGEOLOGICAL LANDSCAPES

Overall Salinity Hazard	Land Salinity	Instream EC
Area within the Project area is classified as 'low'.	Area within the Project area is classified as 'moderate'.	Area within the Project area is classified as 'low'.

2.5 Land Use

The Project area surrounds consist of privately owned farmland, zoned for Primary Production (RU1) in the Narrabri Local Environmental Plan (LEP) 2012. It is understood that this area has historically been used for agricultural purposes, including grazing and cropping. The Project area and surrounding landscape is predominately cleared land, with minimal vegetation remaining, which facilitates ongoing agricultural operations adjacent to the western extent of the Project area lies minor infrastructure attributed to the Narrabri Gas Project.

2.6 Published Studies

The Project is located within the Narrabri LGA and is not covered by any existing studies undertaken by the Narrabri Shire Council (Council), or within the Council mapped Flood Planning Area.

Published studies in the area are summarised in Table 2.8 below.

TABLE 2.8: PUBLISHED STUDIES

Dataset	Dataset(s)	Applicability
Narrabri Local Environmental Plan 2012	Flood Planning Map	The Project is not within the mapped Flood Planning Area.
Narrabri Shire Council	Narrabri Flood Study Report (WRM, 2016)	The Project is not within the mapped flood extents.
Narrabri Gas Project – Environmental Impact Statement	Narrabri Gas Project – Environmental Impact Statement Flood Study (GHD, 2016)	The Project area falls within the extent of this flood study.



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130 0 130 m

Scale in metres (1:5,500 @ A3)

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia
Vertical Datum: Australia Height Datum
Grid: Map Grid of Australia, Zone 55

WPPS CO2 Plant
Surface Water Assessment
Figure 2.7: Soil Classification

Engeny does not give any warranty nor accept any liability in relation to the completeness or accuracy of the maps, which may be inherently reliant upon the completeness and accuracy of the input data and the agreed scope of works.

Job Number:
BNTL00400_0006
Revision: 0
Drawn: IR
Checked: LV
Date: 25 /5 /2026

2.7 Water Extraction Regulatory Framework

2.7.1 Water Management Act 2000

The NSW state government manages the use of all water in rivers, lakes, and aquifers. Some landholders can take water without a licence under as basic landholder rights provisions (refer to Section 2.7.1.2). A water access licence (WAL) or a water supply work and/or water use approval may be required to take water from a river, lake or aquifer. The *Water Management Act 2000* applies to all regions where there is a Water Sharing Plan (WSP) (refer to Section 2.7.1.1) in operation. The following sections discuss basic landholder rights, including the maximum harvestable right associated with the Project landholding.

Operational water requirements for the Project (processing and dust suppression) are proposed to be supplied via an existing groundwater bore (refer to Section 3.4.2). Water licensing requirements relevant to the Project are further detailed in the following sections.

2.7.1.1 Water Sharing Plans

WSPs have been developed under the *Water Management Act 2000* to protect the environmental health of water sources, whilst securing sustainable access to water for all users. The WSPs specify maximum water extractions and allocations and provide licensed and unlicensed water users with a clear picture of when and how water will be available for extraction.

The WSP and surface water source applicable to the Project are summarised in Table 2.9.

TABLE 2.9: APPLICABLE WATER SHARING PLANS

Water Sharing Plan	Water Source – Management Zone
Surface Water	
Namoi and Peel Unregulated Rivers Water Sources 2012	Bohena Creek

2.7.1.2 Basic Landholder Rights

There are three types of basic landholder rights (BLR) in NSW (*Water Management Act 2000*):

- Domestic and stock rights – allows take and use of water for domestic consumption and non-intensive stock watering without the need for a WAL or water use approval. A water supply work approval (i.e. for a bore or dam, etc) is required.
- Harvestable rights – allows landholders to capture and store a proportion of the rainfall runoff from their landholding in one or more harvestable rights dams, without requiring a WAL, water use approval or water supply work approval.
- Native title rights – allows take and use of water in the exercise of native title rights (under the *Commonwealth Native Title Act 1993*), without requiring a WAL, water use approval or water supply work approval (unless the work is a dam or bore).

2.7.1.2.1 Harvestable Rights

Harvestable Rights provisions for the capture and reuse of surface water runoff generated within a property, is subject to the following rules:

- (1) The maximum harvestable rights dam capacity (MHRDC) must be estimated based on landholdings (owned and leased) that are contiguous (generally omits public roads and easements).
- (2) Harvestable rights cannot be transferred between water sources – i.e. water captured within a water source must be covered by a harvestable right in that source.
- (3) Water captured from higher order (3rd order and above) watercourses and above, or within 40 m of a 3rd order watercourse (measured perpendicular from the top of bank), or on any floodplain, or on or within 3 km upstream of any Ramsar wetland, must be covered by a WAL, regardless of the Harvestable Right, unless an exemption from licensing applies under the *Water Management Act 2000* and *Water Management (General) Regulation 2025*.

Harvestable rights dams do not require a WAL, water use approval or water supply work approval. However, if a harvestable rights dam also stores and/or captures water taken under another right or licence this dam is known as a Mixed-rights dam. Mixed-rights dams may require a WAL and water supply work approval prior to construction.

The Project does not propose to use surface water captured under harvestable rights provisions to supply construction or operation phase water demands.

2.7.1.3 Water Access Licenses, Water Use Approvals, and Water Supply Works

In WSP areas, a WAL authorises the holder of the WAL to take water from a water source. All surface water sources in NSW are fully committed and a WAL can only be obtained by purchasing from an existing WAL holder or by applying for a zero share licence (i.e. the WAL does not include any entitlement to take water). Following approval of the zero share WAL, entitlement can be obtained through either trading or allocation assignments. A water supply work approval (WSWA) must also be obtained for the physical infrastructure that would be used to take water.

Water entitlements and allocations can be legally traded as described above for all water sources. Specific trading rules for the identified water sources within the water demand study area are stipulated within the individual Water Sharing Plan. Generally, there are restrictions for limiting movement of entitlement and allocation to within the same water source and altering of the traded allocation licence category.

There are a number of exemptions specified in the *Water Management (General) Regulation 2025* that enable a user to take water without a WAL.

A water supply work approval allows construction and use of works to take water (e.g. pumps, bores, dams, dewatering, etc).

A water supply use approval allows use of water for a particular purpose (e.g. irrigation, power generation, mining, etc). A water use approval allows you to use water on your land. Examples of water uses that require approval are irrigation, town water supply, power generation and mining.

The Applicant currently hold no surface water WALs and does not propose to take surface water under a WAL to supply construction or operation phase water demands.

2.8 Surface Water Users

Licensed surface water users potentially impacted by the Project are located within the Bohena Creek Water Source. A search of the NSW Water Register for the 2025/2026 financial year revealed that there are 17 WALs with a total of 173 unit shares (refer to Table 2.10) within the Bohena Creek Water Source. WALs are predominantly under the unregulated river licence category with the purpose for irrigation.

Groundwater sources relevant to the Project area and groundwater users are detailed in the Groundwater Assessment prepared for the Project.

TABLE 2.10: BOHENA CREEK WATER SOURCE – TOTAL WALs 2025/2026

Access Licence Category	No. of WAL(s)	Total Share Component	Total IDEC (Daily flow shares)	Cumulative AWD
Domestic and stock	1	7	N/A	1
Domestic and stock [stock]	1	5	N/A	1
Unregulated River	15	1,161	N/A	1

3. WATER MANAGEMENT

An overview of the key components and objectives of the proposed construction phase water management and the operations phase water management system (WMS) is provided in the subsequent sections.

3.1 Water Classification

Water will be managed according to type, with classification determined by catchment source, quality and use. The main types of water associated with the Project are summarised in Table 3.1.

TABLE 3.1: WATER MANAGEMENT SYSTEM CLASSIFICATION

Water Category	Description
Clean Water	- Runoff from the undisturbed upstream catchments or from hardstand areas with a low risk of being contaminated by chemicals and/or entrained sediment. - Permeate water from the RO water treatment plant (WTP). - Potable water for site amenities.
Dirty Water	Runoff from disturbed areas that are expected to contain increased concentrations of suspended sediment (e.g. during construction).
Process / Contaminated Water	- Runoff from areas that has an elevated risk of being contaminated by chemicals (e.g. hydrocarbons, solvents and MEA) or water used in CO₂ processing. - Concentrate from the RO WTP.
Wastewater	Wastewater from site amenities.

3.2 Construction Phase Water Management

During the construction phase of the Project, erosion and sediment controls (ESCs) will be used to minimise erosion and reduce the risk of sediment-laden runoff reporting off site. During all phases of the Project, including the construction phase, ESCs will be designed and implemented generally in accordance with requirements outlined in the Managing Urban Stormwater – Soils and Construction Volume 1 (Landcom, 2004) and Volume 2 (Department of Environment and Climate Change, 2008) (hereafter, collectively referred to as the ‘Blue Book’). The following sections outline the Project ESC design standards and anticipated ESCs to be implemented at the Project. Should the Project be approved and constructed, a detailed soil and water management plan (SWMP) will be prepared by a suitably qualified person to facilitate implementation of best practise ESCs during all phases of the Project.

3.2.1 Design Standard

3.2.1.1 Erosion Controls

Erosion hazard is dependent on a range of factors including soil characteristics, topography, rainfall intensity and groundcover. The erosion hazard (i.e., low or high) for a given location helps to inform what erosion and sediment controls (ESCs) should be implemented to minimise onsite erosion and transport of sediment to the downstream environment.

An erosion hazard assessment has been undertaken in accordance with Chapter 4.4.1 of Volume 1 of the 'Blue Book'. The R-factor (rainfall erosivity) for the Project was calculated using Equation (2) in Appendix A of the Blue Book Volume 1:

$$R = 164.74 \times 1.1177^S \times S^{0.6444}$$

where:

S is the 2-year, 6-hour duration storm event (or 0.5EY storm event based on AR&R 2016 terminology) intensity for the Project location (5.1 mm/hr).

$$R = 164.74 \times 1.1177^{0.45} \times 0.45^{0.6444}$$

$$R = 830$$

Plotting the slope across the Project disturbance area, estimated to be approximately 0.45% (derived from Project specific survey) and R-factor on Figure 4.6 from Volume 1 of the 'Blue Book' determines whether the Project site has a high or low erosion hazard. Figure 3.1 presents the erosion hazard assessment plot which demonstrates that the site has a low erosion hazard.

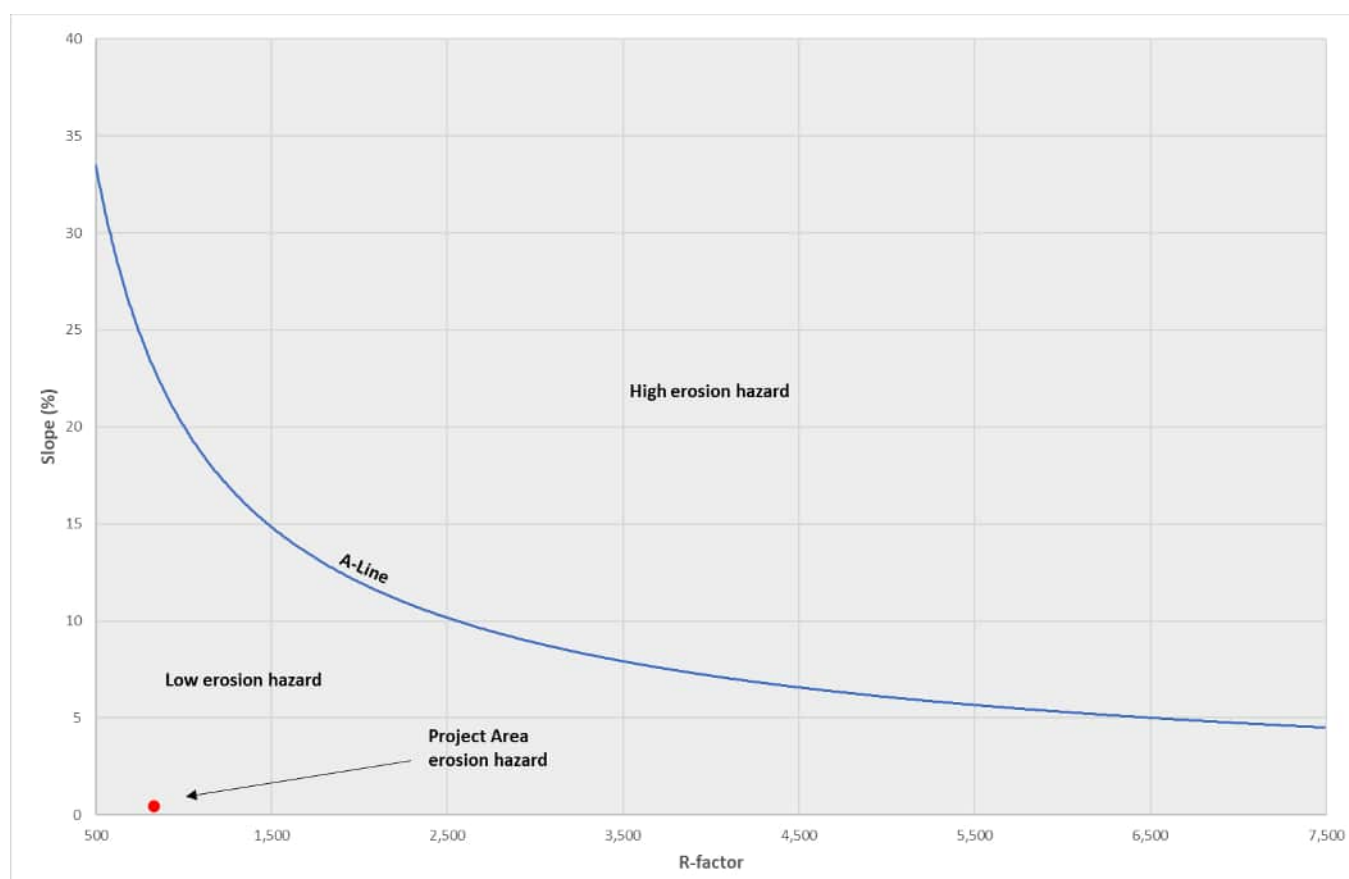


FIGURE 3.1: EROSION HAZARD ASSESSMENT PLOT

While the erosion hazard assessment indicates a low erosion hazard for the Project area, soil loss class is also used to indicate erosion hazard based on calculated soil loss (as tonnes/ha/year) and in conjunction with the Project rainfall distribution zone can be used to identify the requirements for works timing restrictions and/or special erosion control measures. The 'Blue Book' defines seven soil loss classes that equate to erosion hazards ranging from very low to extremely high based on the soil loss rate determined using the RUSLE (refer to Table 4.2 of Volume of the 'Blue Book'). The annual soil loss rate for the Project has been estimated using RUSLE using the parameters provided in Table 3.2.

TABLE 3.2: RUSLE PARAMETERS

Parameter	Definition and Value Source	Value	Units
A	The Annual soil loss rate.	17.9	tonnes/ha/year
R	Rainfall erosivity. The R-factor for the Project was calculated using Equation (2) in Appendix A of the Blue Book Volume 1 as described in Section 3.2.	830	-
K	The value of 0.06 for soil erodibility has been adopted as K-factor for the Project from the eSpade NSW Soil and Land Information website (DPE, 2024). with a 20% increase because the soils are classified as dispersive (refer to Section 2.4) as per recommendation in Appendix A (Section A3) of Blue Book Volume 1.	0.072 (0.06 x 120%)	-
LS	The slope length gradient factor. Sourced from Table A1 the Blue Book Volume 1 and is dependent on the maximum slope length (estimated at 150 m) and average site slope of 0.45%.	0.23	-
C	The ground cover factor. Sourced from Figure A5 of the Blue Book Volume 1 (assume worst case of no groundcover).	1	-
P	Erosion control Practice factor. Sourced from Table A2 the Blue Book Volume 1 and is dependent on level of compaction and roughness of the disturbed surface (assume compacted and smooth).	1.3	-

RUSLE: $A = R \times K \times LS \times C \times P$

$A = 830 \times 0.072 \times 0.23 \times 1.0 \times 1.3$

$A = 17.9 \text{ tonnes/ha/year}$

The calculated annual soil loss rate for the Project area (17.9 tonnes/ha/year) corresponds to a soil loss class of 1 which has a very low erosion hazard (refer to Table 4.2 of Volume 1 of the 'Blue Book'). Figure 4.9 of Volume 1 of the 'Blue Book' shows that the Project is located in rainfall distribution zone 8. Table 4.3 of Volume 1 of the 'Blue Book' indicates that no construction works timing restrictions or special erosion control measures apply for sites in rainfall distribution zone 8 with soil loss class 1.

3.2.1.2 Drainage Controls

All proposed temporary drainage controls must be designed to have non-erosive hydraulic capacity to accommodate a 10 year Average Recurrence Interval (ARI) (equivalent to 10% Annual Exceedance Probability (AEP)) critical duration design storm event (refer to Section 2.3.1. of Volume 1 of the 'Blue Book').

3.2.1.3 Sediment Controls

The 'Blue Book' states that sediment basins are required to be used when the soil loss rate exceeds 150 m³ /year (approximately 200 tonnes/year) for the total disturbed area. The total estimated disturbance area of the Project is approximately 0.76 ha. This estimate assumes that the total disturbance is the area of Project features (i.e., access tracks, processing plant, turn around pad, carpark and the hardstand areas) in the general arrangement plan:

Disturbed Area = Combined Area of Project Features

Disturbed Area = 0.76 ha

Based on a soil loss rate 17.9 tonnes/ha/year (refer to Section 3.2.1.1), the total soil loss based on the disturbance area is approximately 13.6 tonnes/year. As the estimated soil loss is less than the 200 tonnes/year, a sediment basin is not required for Project construction.

All temporary sediment controls are to be stable during a 10% AEP critical duration storm event.

3.2.2 Erosion and Sediment Control Strategy

All ESCs should be installed, managed and maintained in accordance with the 'Blue Book' to:

- Divert clean water (i.e., runoff from undisturbed areas) around disturbed areas where possible.
- Minimise the movement of sediment off site by tracking and sediment laden runoff draining off site and entering watercourses, drainage lines or drain inlets.
- Reduce surface flow velocity and capture sediment retain sediment laden water within the Project area.
- Minimise the amount of material transported from site to surrounding pavement surfaces.

3.2.2.1 Erosion and Sediment Controls

It is anticipated that the following ESCs will be implemented at the Project:

- (1) No ground disturbance (other than disturbance for the installation of required ESCs) is to occur until the ESCs required for each work stage are installed and functional.
- (2) Disturbance boundaries shall be clearly marked prior to the commencement of construction activities (e.g. via construction fencing, barrier tape or similar).
- (3) Construction activities including vehicle and machinery movements, stockpiling, temporary vehicle parking and material laydown will be restricted to designated work areas, where possible, to minimise ground disturbance.
- (4) Works are to be staged as far as practicable, to minimise the extent of soil exposure and the duration of exposure. Disturbed areas must be progressively rehabilitated with stabilisation works commencing as soon as practicable following the completion of construction activities.
- (5) Where possible, topsoil will be stripped and handled only when it is moist (not too wet or too dry) to avoid decline of soil structure.
- (6) Topsoil stockpiles will be stabilised with vegetation (seeded) if they are to be inactive for long periods.
- (7) Stockpiles of erodible material that have the potential to cause environmental harm if displaced will be located away from concentrated surface flow and excessive up-slope stormwater surface flows.
- (8) Wherever reasonable and practicable, "clean" surface waters must be diverted away from sediment control devices and any untreated, sediment-laden waters.
- (9) All runoff from the works is to be passed through sediment controls.
- (10) Sediment traps should be located as close to the source of the sediment as practicable.
- (11) Sediment control devices must be de-silted and made fully operational as soon as reasonable and practicable after a sediment-producing event. Sediment traps should be maintained to ensure that no more than 30% of their design capacity is lost to accumulated sediment.
- (12) Sediment removed from any trapping device is to be disposed of in locations where further erosion and consequent pollution to downslope lands and waterways will not occur.
- (13) Vehicle wash down is to occur in a designated bunded area. This bunded area is to be located at least 5 m from any onsite drain and 10 m from any watercourse. Excess debris from cleaning and washing is to be removed using hand tools.
- (14) Any concrete washout undertaken onsite will be in a bunded area that is outside of any flood prone area and at least 10 m from drains and waterways.
- (15) Fuels, chemicals and liquids must be stored in impervious bunded areas outside of any flood prone area and at least 50 m away from any areas of concentrated water flow, flooded or poorly drained areas, and areas where slope exceeds 10%.
- (16) Refuelling of plant and equipment is to be undertaken in an impervious bunded area.
- (17) Emergency spill kits must be kept onsite at all times. All workers are to be made aware of the location of the spill kits and trained in their use.

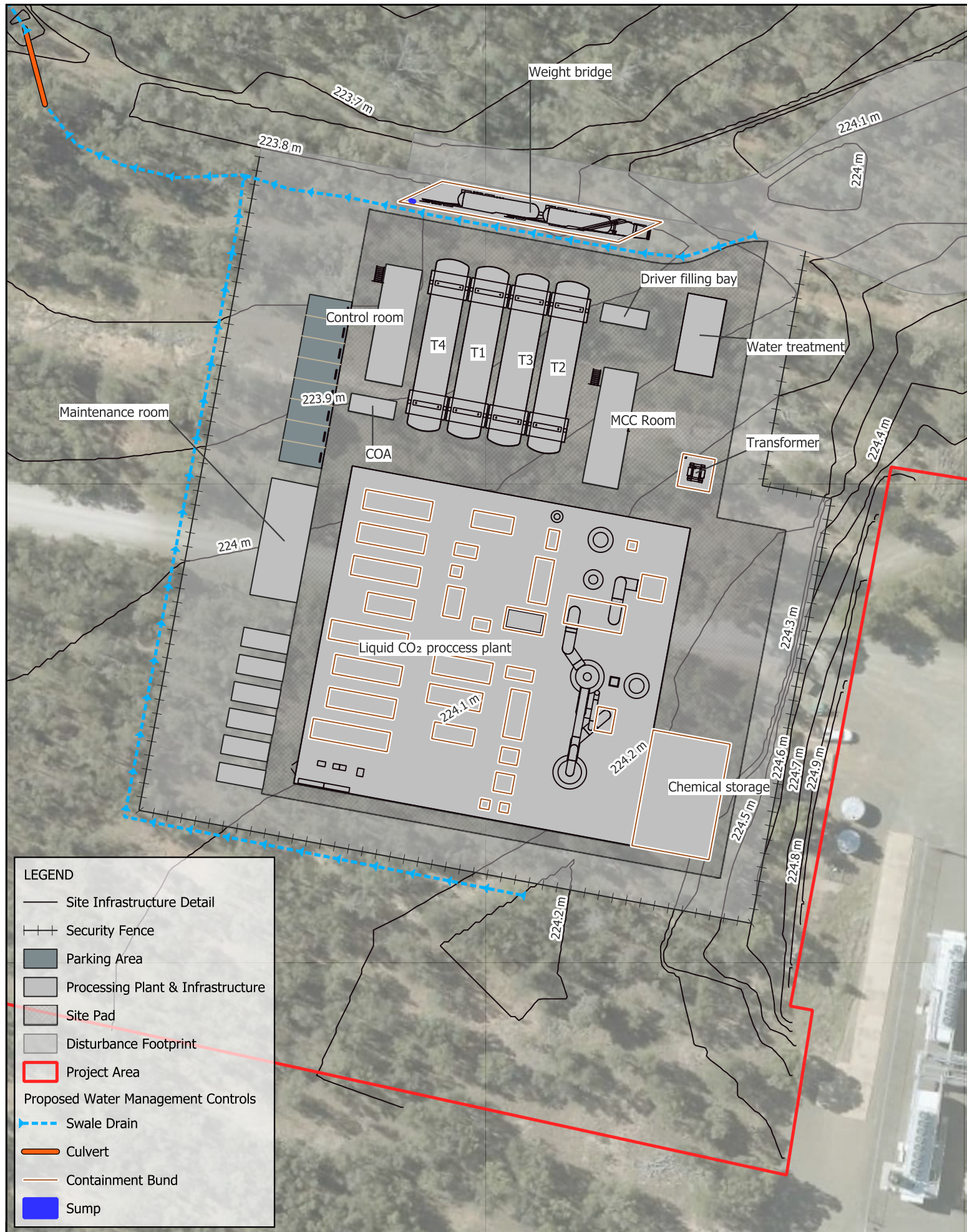
Removal of temporary ESCs is only to occur after disturbed areas are stabilised appropriately in accordance with the requirements of the 'Blue Book'. Appropriate stabilisation for the site is considered to be achieved when the rehabilitated areas have a ground cover C-factor of less than 0.05 (greater than 70% ground cover).

3.3 Operational Water Management

A Project stormwater management system (WMS) will be developed by a suitably qualified engineer during detailed design in accordance with Council's document 0074 STORMWATER DRAINAGE (DESIGN) (Narrabri Shire Council, 2023). A conceptual operational WMS is provided in Figure 3.2. The key objectives of the conceptual WMS include:

- Divert and release, where practical, catchment runoff from undisturbed catchments and clean hardstand areas to minimise the quantity of dirty water runoff to be managed.
- Contain and manage all untreated sediment-laden runoff from disturbed areas in accordance with the 'Blue Book'.
- Capture and contain stormwater that has an elevated risk of being contaminated by chemicals (e.g. hydrocarbons, solvents and MEA) or water used in CO₂ processing in bunds.

Key components of the water management system and their associated functions used to achieve the above objectives are described in Table 3.3.



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Scale in metres (1:600 @ A3)

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia
Vertical Datum: Australia Height Datum
Grid: Map Grid of Australia, Zone 56

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Figure 3.2: Conceptual Water Management System

Engeny does not give any warranty nor accept any liability in relation to the completeness or accuracy of the maps, which may be inherently reliant upon the completeness and accuracy of the input data and the agreed scope of works.

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TABLE 3.3: OPERATIONAL WATER MANAGEMENT SYSTEM COMPONENTS

WMS Component	Relevant Water Type	Functional Description
Swale Drains	Clean	- Capture runoff undisturbed upstream catchments or from hardstand areas with a low risk of contamination. - Redirect clean runoff away from the Project and release to the downstream environment via energy dissipation structures to discharge flows in a non-erosion manner.
Containment Bunds	Contaminated Water	- Capture and contain runoff from areas with an elevated risk of contamination in bunds. - Captured water would undergo water quality testing to confirm whether it is suitable for release offsite from bunded areas, via proposed swale drains. - If deemed unsuitable for release off site, contaminated water would be pumped out into containment tanks for disposal off site at an approved licensed facility.
Sump	Contaminated Water, Sediment Water	- Capture runoff from the weighbridge. - Captured water would undergo water quality testing to confirm whether it suitable for release off site, via proposed swale drains. - If deemed unsuitable for release offsite, contaminated water would be pumped out into containment tanks for disposal off site at an approved licensed facility.
RO Water Treatment Plant	Raw Water	Treat raw water sourced from an existing groundwater bore for use in the process plant.
Secondary RO Water Treatment Plant	Process Water, RO Concentrate	- Where possible, treat the following water streams to a quality suitable for irrigation: - RO concentrate. - Process water from the plant, including from: - Flue gas scrubber drain. - Water separator drain.
Containment / Wastewater Tanks	Process / Contaminated Water, RO Concentrate Wastewater	- The following water streams would be collected and pumped out into tankers for disposal offsite at an approved licensed facility: - Contaminated water from containment bunds. - Wastewater from site amenities. - Acid drain. - Process water from the plant, if treatment for irrigation is not suitable. - RO concentrate, if treatment for irrigation is not suitable.
Irrigation	Treated Wastewater	Where possible, wastewater would be treated in a secondary RO plant to suitable limits and used for irrigation (refer to Section 3.4.3).

3.4 Water Balance

Overall inflows, outflows and internal transfers associated with the conceptual WMS are summarised in Table 3.4.

TABLE 3.4: WMS INFLOWS AND OUTFLOWS

Type	Phase	Description
Inflows		
Rainfall and Runoff	Construction and Operation	Rainfall and runoff captured by containment bunds.
Potable Water Supply	Construction and Operation	Potable water trucked in for use in onsite amenities and dust suppression.
Raw Water Supply	Operation	Raw water supply for the RO plant, sourced from an existing groundwater bore.
Outflows		
Dust Suppression	Construction	Water applied to roads and disturbed areas within the Project disturbance area during construction.

Type	Phase	Description
Evaporation	Construction and Operation	Evaporative losses from sumps and bunded areas.
Wastewater	Construction and Operation	Wastewater from site amenities and RO concentrate.
Controlled Discharges	Construction and Operation	Controlled discharges of stormwater captured by erosion and sediment control structures (construction) and swale drains, containment bunds and sumps (operation), which is deemed suitable for release off site.
Uncontrolled Discharges	Construction and Operation	Overflows from erosion and sediment control structures (construction) and containment bunds and sumps (operation).
Process Water Demands	Operation	Water used for processing of CO ₂ . This water will be supplied from RO permeate. Once used in the plant, process water will be collected and sent to a secondary RO plant for irrigation or disposal off site.
Irrigation Water	Operation	Treated waste process water distributed through a piping system connected to sprinkler network to cover the required irrigation area.

3.4.1 Water Demands

Water demand will vary, depending on the stage of the Project. The total water demand during construction and operation, presented in Table 3.5, has been estimated based on the current Project layout and description, provided in Section 1.1.

TABLE 3.5: PROJECT WATER DEMANDS SUMMARY

Construction Demand	Demand (ML)	Basis
Dust Suppression	Average - 5.8 Maximum – 6.2	Average demand: 37.5 kL/day Maximum demand: 40.0 kL/day - Assumes watercart loads based on daily rainfall: - Up to 2 x 20,000 L watercart loads for days with less than 5 mm of rain - Up to 1 x 20,000 L watercart load per day for days with less than 15 mm of rain. - No additional dust suppression required for days with more than 15 mm of rain. - Based on 136 years of historical climate data. 7,601 m² disturbance area.
Vehicle and Equipment Washdown	0.3	- Demand: 2,000 L/day (assumed) - Active construction days (6 months, 6 days/week): 155 days
Potable Water	0.2	50 L/day/site worker (assumed) 20 Full Time Equivalent (FTE) site workers 155 active construction days
Total Construction Demand	Average: 6.3 Maximum: 6.7	
Operational Demand	Annual Demand (ML/year)	Basis
Process Water	11.1	1,380 L/hour feed water (proposed) - Hours of operation: 24 hours/day, 7 days/week 4 weeks of maintenance shutdown per year
Potable Water	0.04	50 L/day/site worker 2 Full Time Equivalent (FTE) site workers 365 active days
Total Operational Demand	11.2	

The maximum daily demand rates anticipated for the Project include:

- Maximum daily non-potable construction demand (dust suppression + vehicle and equipment washdown) = 42 kL/day.
- Maximum daily potable construction demand = 1.0 kL/day.
- Maximum daily non-potable operational demand = 33.1 kL/day.
- Maximum daily potable operational demand = 0.1 kL/day.

The provided water demand volumes and rates are estimates based on the information available at the time of this assessment and will be confirmed during detailed design.

3.4.2 Water Supply

It is understood that potable and non-potable construction water demands will be purchased and transported to site by water cart. This will be coordinated with suppliers (e.g. Council, others) prior to Project commencement.

Non-potable operational demands will be supplied using an existing groundwater bore, treated using an RO treatment plant. It is understood that the Applicant does not hold any licenses and will obtain applicable WALs, works approvals and water use approvals prior to any water extraction taking place.

3.4.3 Wastewater Management

During construction and operation, wastewater from site amenities and temporary construction facilities will be collected in tanks and transported to an approved licensed facility, such as the Narrabri Wastewater Treatment Plant (WWTP).

Waste process water (flue gas scrubber drain, water separator drain and RO concentrate) will be treated in a secondary RO plant to a quality suitable for irrigation (Table 3.6), as informed by the Land Capability Assessment (Minesoils, 2026) undertaken for the Project. The treated water will be stored in a 30 kL tank with irrigation proposed to occur once every two days (5 hours total) at an application rate of 2 m³/hr (approximately 10 kL per irrigation cycle). The treated water will be distributed through a piping system connected to a sprinkler network to cover the required irrigation area.

Concentrated wastewater from the secondary RO plant, in addition to wastewater from the acid drain will be stored in a 50 kL tank with weekly transport off site for disposal. If, for any reason, irrigation is considered not possible, all wastewater would be disposed of off site. In this scenario, offsite transport would occur more regularly. It is understood the Applicant is in discussions with Council to confirm whether this wastewater will be disposed of as a trade waste, or transported to a licensed facility.

TABLE 3.6: INDICATIVE TREATED WATER QUALITY FOR IRRIGATION

Parameter	Concentration (mg/L)
CO ₂	40
[HCO ₃ ⁻]	32.3
[CO ₃ ⁻]	0.002
[NH ₄ ⁺]	0.421
TDS	52

4. IMPACT ASSESSMENT

4.1 Water Security

The total operational water demand is estimated to be 11.2 ML/year and is proposed to be sourced from an existing groundwater bore. In line with the *Water Management Act 2000*, the Applicant will obtain applicable WALs, works approvals and water use approvals prior to any water extraction taking place, to ensure no impacts to other groundwater users. This approval is being assessed via a bore dealing assessment and is not a part of this assessment.

4.2 Water Quality

Several components of the Project introduce potential for impacts to the quality of surrounding surface water. The activities, potential impacts and proposed mitigation measures are summarised in Table 4.1.

TABLE 4.1: SURFACE WATER QUALITY IMPACTS

Activity	Project Phase	Risk / Impact	Mitigation Measure Overview
- Vegetation clearing and ground disturbance. - Earthworks. - Concrete works. - Vehicle movement.	Construction	- Soil erosion and sedimentation of downstream watercourses. - Spill of hydrocarbons or other pollutants used to support transportation and construction activities.	- Erosion and Sediment Control Plan (ESCP) - Construction Environmental Management Plan (CEMP).
Wastewater from site amenities.	- Construction - Operation	Discharge / spill of wastewater (treated or untreated) into downstream watercourses.	Appropriately designed and maintained wastewater management system.
Controlled and uncontrolled discharge of water from WMS.	- Construction - Operation	Discharge of sediment-laden or potentially contaminated water (treated or untreated) into downstream watercourses.	- Appropriately designed and maintained WMS (as outlined in Section 3). - Controlled discharge of water completed in accordance with appropriate water quality concentration limits.

There are no mapped watercourses within the Project area. The downstream receiving watercourse, Pig Creek, is a 1st order ephemeral creek. With the mitigation measures tabulated in Table 4.1 in place, it is considered that potential surface water quality impacts will be negligible.

4.2.1 Water Pollution Impact Assessment

The EPA's guidance for industry and practitioners on the relevant statutory, policy, and technical framework to consider when conducting a water pollution discharge impact assessment is summarised in Figure 4.1 (NSW EPA, 2022). A summary of the water pollution impact assessment undertaken for the Project is included in Table 4.2.

The assessment indicates that with the proposed mitigation measures, the potential impact of discharge from the Project would be *Low*.

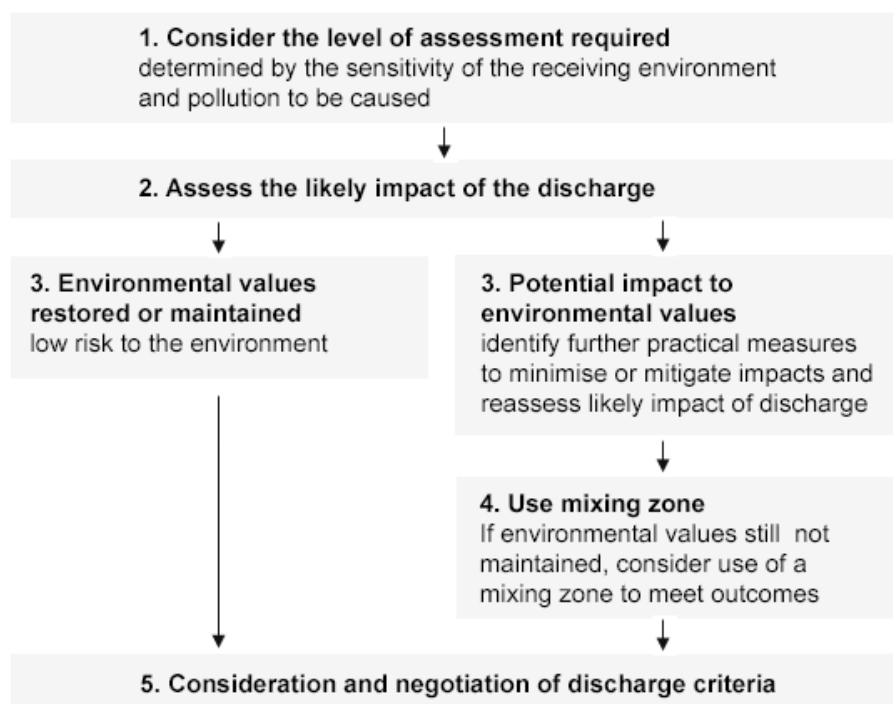


FIGURE 4.1: STEPS IN CONDUCTING A WATER POLLUTION IMPACT ASSESSMENT

TABLE 4.2: WATER POLLUTION IMPACT ASSESSMENT SUMMARY

Step	Description	Outcome / Basis of Assessment
1. Consider the level of assessment required	The level of assessment should reflect the level of risk to the environmental values of a waterway.	Level of Assessment: <u>Simple Qualitative Assessment</u> Risk of water pollution is low: - The Project will include containment bunds around any areas potentially in contact with contaminants (e.g. solvents, MEA, hydrocarbons, etc.). - RO concentrate water would only be used for irrigation if treated to a suitable limit (refer to Section 3.4.3). - The Project is located within the Pig Creek catchment, an ephemeral watercourse within the Namoi Catchment.
2. Assess the likely impact of the discharge	Involves: - Identify the environmental values (The NSW Water Quality Objectives (WQOs) are the community's agreed values and uses (environmental values) of waterways for all NSW catchments) - Assign a protection level to the waterway - Choose appropriate indicators - Identify relevant guideline values	Likely Impact of Discharge: <u>Low</u> Environmental Values: Refer to Table 2.2 for relevant Namoi River Catchment WQOs. Moderate to High relevance: - Livestock water supply - Irrigation water supply - Drinking water Waterway Protection Level: Refer to Table 2.4 for Pig Creek river management. Strategic river management (poor stream condition/disturbed due to cropping)

Step	Description	Outcome / Basis of Assessment
	(e) Identify measures to minimise or mitigate impacts to the environmental values (f) Assess the potential impact of the discharge	(c) Key Indicators: Salinity (electrical conductivity) / TDS (based on predicted permeate concentrations in RO specifications) (d) Relevant guideline values: – No adverse effects on livestock animals expected: TDS < 2000 mg/L (ANZECC 2000 Guidelines) – Drinking water: <1,500 µS/cm – Safe for Irrigation: Consider irrigation water quality, soil properties, plant salt tolerance, climate, landscape and water and soil management (Section 4.2.4 of ANZECC 2000 Guidelines) – <i>to be addressed separately in Land Capability Statement.</i> (e) Mitigation: If captured / treated water exceeds guideline criteria, pump out into containment tanks for disposal offsite at an approved licensed facility. (f) Potential Impact (after mitigation): Low
3. Are the environmental values restored or maintained?	Where the environmental values of a waterway are not being achieved and the discharge will not contribute towards their restoration, the assessment should consider the key causes and any operational changes or further practical measures to minimise or mitigate the identified impacts.	Environmental Values: Maintained with proposed mitigation.
4. Use of a mixing zone	A mixing zone is an area around a discharge where certain environmental values are not protected.	Not Applicable. Project will not prevent protection of key environmental values and will not discharge directly into a watercourse.

4.3 Flooding and Flow Regimes

A review of flood modelling undertaken for the Narrabri Gas Project (GHD, 2016) indicates that the Project area is not subject to flood inundation under both the 10% and 1% Annual Exceedance Probability (AEP) storm events and the Probable Maximum Flood (PMF). The maximum flood depth maps utilised from the Narrabri Gas Project in relation to the Project area are shown in Appendix A. These show that the Project area is outside of the flood extents for all events; 10% AEP, 1% AEP and PMF.

Additionally, the local contributing catchment to the Project area is relatively small (approximately 7.6 ha) compared to the downstream Pig Creek catchment (2,179 ha). The proposed infrastructure and hardstand areas within the Project area would also be limited, based on the proposed disturbance footprint of ~0.76 ha, and are not expected to materially impact the flow of surface water within the Pig Creek catchment. Similarly, runoff from bunded areas and sumps which will be temporarily retained, would equate to a minor portion (<0.1%) of the overall Pig Creek Catchment.

No runoff from the Project area is directed toward Bohena Creek, and there is no planned extraction from Bohena Creek water source, aside from rainfall temporarily retained within bunded areas. Given the relative difference in catchment size between the Namoi River (approximately 42,000 km²) and the local catchment reporting to the Project (<1 km²), and the relative location of the Project within a reasonable distance from the Namoi River it is considered that the Project will have negligible impacts on flows in the Namoi River.

Flooding and loss of catchment yield due to the Project is therefore considered negligible.

4.3.1 Climate Change Sensitivity

A climate change sensitivity assessment was not directly undertaken for the Project, however, the Narrabri Gas Project was reviewed to inform the assessment. Generally, the 0.5% and 0.2% AEP flood events are accepted as proxies for climate change scenarios, compared to the 1% AEP. While these specific events were not included in mapping for the Narrabri Gas Project (GHD, 2016), the Project area was found to be located outside the PMF flood extent. Given the PMF represents the maximum probable flood scenario, it can be assumed that the Project area would also lie outside the extents of the 0.5% and 0.2% AEP events. Therefore, the sensitivity of flooding to climate change within the Project area is considered to be negligible.

4.4 Cumulative Impact Assessment

In accordance with the Cumulative Impact Assessment Guidelines for State Significant Projects (DPIE, 2022), cumulative impacts are a result of incremental, sustained and combined effects of human action and natural variations over time and can be both positive and negative. The accumulation of effects from past, current and future activities can result in cumulative impacts on surface and groundwater resources. When considered in isolation, impacts from specific projects may be considered minor or negligible, however, when multiple projects influence common receivers, the cumulative impact may be more significant.

The Project is located adjacent to the existing WPPS (Approved MP07_0023). The potential for cumulative impacts from the Project and the existing WPPS has been considered, as presented in Table 4.3.

The key common surface water receptor which was considered in the cumulative impact assessment includes Pig Creek, a tributary of the Namoi River. The Project and the existing WPPS are located within the Pig Creek catchment, approximately 400 east of the watercourse (refer to Figure 2.5). No direct interactions with Pig Creek and the Project are expected and adopting appropriate mitigation and management will minimise the likelihood of indirect impacts, such as erosion and sedimentation, to the downstream surface water receptors. Therefore, cumulative impacts to surface water quality and flow are considered negligible.

TABLE 4.3: POTENTIAL CUMULATIVE IMPACTS

Category of Impact	Potential Cumulative Impact
Flooding	The Projects may impact flow regimes within the Pig Creek catchment (tributary of the Namoi River), however, both projects have a limited footprint, compared to the wider Pig Creek catchment and are located outside of the mapped 1% AEP flood extent. Cumulative flooding impacts are considered negligible.
Water Quality	The risk of pollution of common receiving waterways (Pig Creek) from erosion and sedimentation or contaminant/wastewater spills during overlapping construction/operation periods is considered negligible provided the recommended mitigation measures are implemented.
Surface Water and Groundwater Supply	- Construction water supply will be minimal and mostly trucked onto site. - Operational demands will be supplied by groundwater in accordance with NSW licensing requirements and therefore do not contribute to cumulative impacts on groundwater take. An Impact Assessment was undertaken and is detailed in Section 5 of the Groundwater Assessment prepared for the Project (Engeny Australia Pty Ltd, 2025).

5. MONITORING AND MANAGEMENT MEASURES

5.1 Monitoring

5.1.1 Surface Water

5.1.1.1 Construction

During construction, stormwater will be managed in accordance with 'Blue Book'. A comprehensive monitoring and maintenance plan would be developed as part of an Erosion and Sediment Control Plan (ESCP), prior to any construction works taking place.

5.1.1.2 Operation

During operation, water will be managed generally in accordance with the proposed conceptual WMS (refer to Section 3.3), and any potentially contaminated water captured by containment bunds will be only be released off site following testing and confirmation that appropriate water quality limits are met. If captured water does not meet the required criteria, it will be pumped out into containment tanks for disposal off site at an approved licensed facility.

Ongoing surface water quality monitoring will be undertaken at the downstream culvert to assess discharged stormwater against the impact assessment criteria (to be determined post-approval). The monitoring regime will include pH, salinity (EC), turbidity, total suspended solids (TSS) and Oil and Grease on a monthly basis, or during discharge events.

5.1.2 RO Concentrate Water / Waste Process Water

As discussed in Section 3.4.2, process water will be supplied from RO permeate. A by-product of the RO treatment is a concentrate with elevated concentrations of dissolved solids. Water quality testing will determine the water management option for the RO concentrate, as well as waste process water leaving the site:

- (1) If concentrate water can be treated to required limits, it may be used for irrigation (subject to relevant approvals).
- (2) If concentrate water cannot be treated to required limits, it will be collected in containment tanks for disposal off site at an approved licensed facility.

5.1.3 Amenities Potable Water

The proponent will implement an inspection and water quality testing program for potable water stored in tanks on site (delivered by water tanker) to ensure amenities water quality meets the Australian Drinking Water Guidelines – Version 3.5 (ADWG) (National Health and Medical Research Council, 2011).

5.2 Mitigation and Management Measures

Detailed environmental studies have been undertaken to inform the Project design, including the assessments detailed in this SWA. The consideration and outcomes of these studies in the design, and integration with the existing WPPS (Approved MP07_0023) operations, minimise the potential for impacts on surface water resources. A summary of potential impacts to surface water and proposed mitigation measures are included in Table 5.1.

TABLE 5.1: SUMMARY OF POTENTIAL IMPACTS AND MITIGATION MEASURES

Potential Impact	Mitigation Measure	Project Implementation Stage
Water Supply		
Water licences to meet demands	All required water licensing and approvals will be coordinated with associated landholders and/or regulators if that source is needed to support water supply arrangements for during construction and operation.	Post Approval (prior to Operation)
Water Quality		
Erosion and sedimentation of downstream watercourses	Development of an erosion and sediment control plan (ESCP) through all project phases, in accordance with Managing Urban Stormwater: Soils and Construction – Volume 1 (Landcom, 2004), Volume 2 (DECC, 2008). The ESCP will detail area specific erosion and sediment control measures to be implemented and maintained during construction, as well as ongoing monitoring and maintenance through operation and decommissioning of additional controls if identified as required. The total area of disturbance at any time will be minimised where possible and ongoing rehabilitation and stabilisation strategies implemented throughout construction.	Construction
Contaminant spills	Prior to commencing construction activities, a Construction Environment Management Plan (CEMP) and an Operational Environmental Management Plan (OEMP) will be developed to identify site specific controls and procedures to minimise the potential for hydrocarbons and other contaminants being discharged to the surrounding environment. This CEMP and OEMP should consider: • Storage of solvents, MEA, hydrocarbons and other liquid chemicals within an above ground, bunded areas away from watercourses or area subject to high levels of overland sheet flow. • Re-fuelling of construction vehicles and equipment to be limited to designated areas, with adequate spill management controls. • Emergency spill response procedures. • Maintain an emergency spill kit. • Transport and dispose of any captured chemical spills and contaminated soils/materials to a suitable offsite licenced facility.	Construction and Operation
Surface water and groundwater quality impacts	The CEMP and OEMP will consider the following management measures to minimise the potential impacts to surface water and groundwater quality within and surrounding the Project area: • Develop and implement a suitable monitoring regime at discharge location (downstream culvert), including visual inspections and routine monitoring of relevant physicochemical parameters. • Develop and implement a suitable monitoring regime of all stormwater and erosion and sediment control structures, particularly following large flow events	Construction and Operation
Flooding		
Increased stormwater runoff from vegetation clearing and filling for infrastructure	A Operational Stormwater Management Plan (OSMP) will be developed in accordance with Council requirements to manage increased stormwater runoff during operations (due to clearing of vegetation and filling for infrastructure) and will consider: • Diversion of upstream flows around site infrastructure as required, to minimise scouring and erosion. • Inspection and monitoring regimes to maintain stormwater and erosion and sediment control structures.	Construction
Impacts to in-stream and overland flooding	Minimise filling of Project infrastructure to minimise impacts to overland flooding.	Detailed design

6. REFERENCES

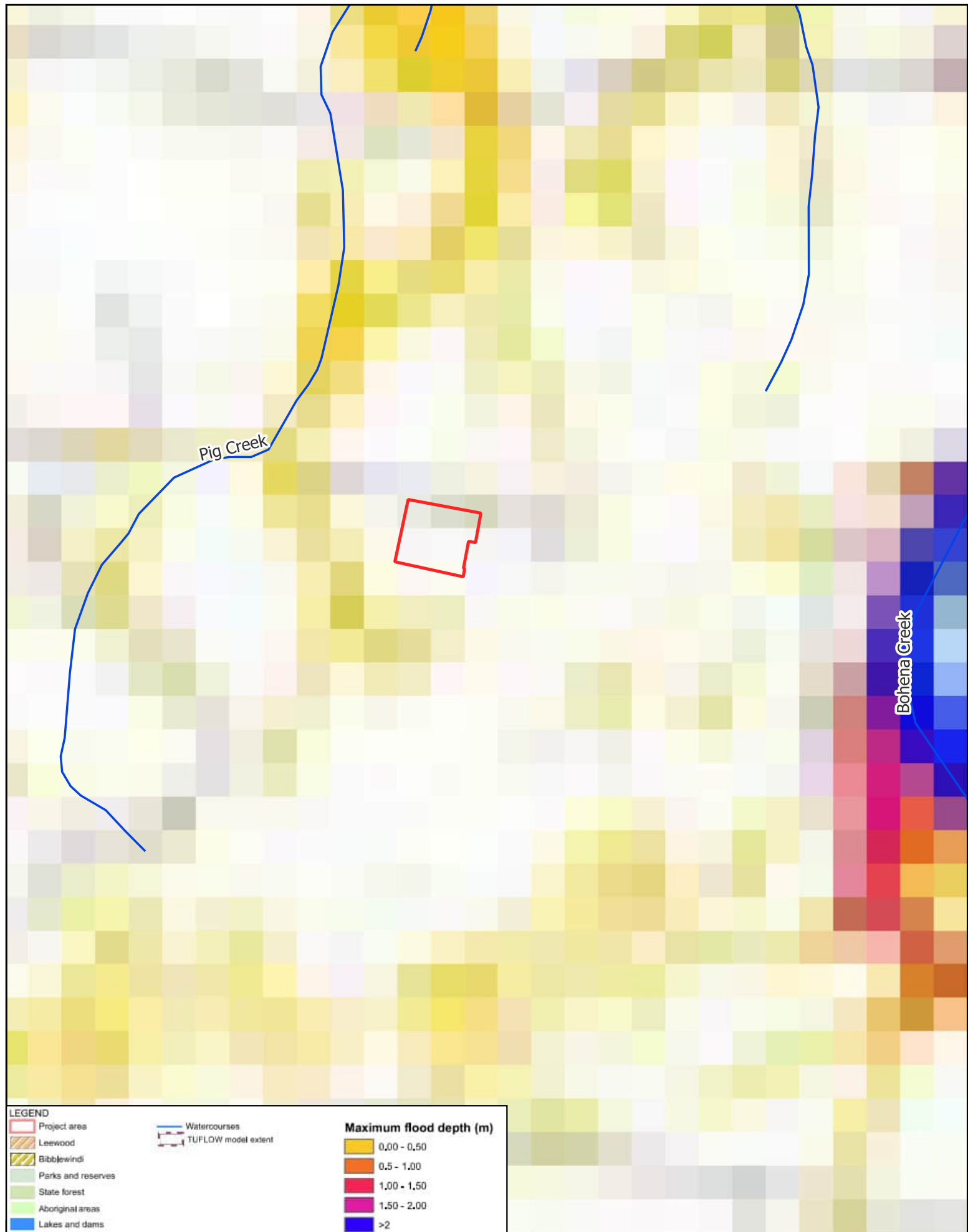
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7. QUALIFICATIONS

- (a) In preparing this document, including all relevant calculation and modelling, Engeny Australia Pty Ltd (Engeny) has exercised the degree of skill, care and diligence normally exercised by members of the engineering profession and has acted in accordance with accepted practices of engineering principles.
- (b) Engeny has used reasonable endeavours to inform itself of the parameters and requirements of the project and has taken reasonable steps to ensure that the works and document is as accurate and comprehensive as possible given the information upon which it has been based including information that may have been provided or obtained by any third party or external sources which has not been independently verified.
- (c) Engeny reserves the right to review and amend any aspect of the works performed including any opinions and recommendations from the works included or referred to in the works if:
 - (i) Additional sources of information not presently available (for whatever reason) are provided or become known to Engeny; or
 - (ii) Engeny considers it prudent to revise any aspect of the works in light of any information which becomes known to it after the date of submission.
- (d) Engeny does not give any warranty nor accept any liability in relation to the completeness or accuracy of the works, which may be inherently reliant upon the completeness and accuracy of the input data and the agreed scope of works. All limitations of liability shall apply for the benefit of the employees, agents and representatives of Engeny to the same extent that they apply for the benefit of Engeny.
- (e) This document is for the use of the party to whom it is addressed and for no other persons. No responsibility is accepted to any third party for the whole or part of the contents of this Report.
- (f) If any claim or demand is made by any person against Engeny on the basis of detriment sustained or alleged to have been sustained as a result of reliance upon the Report or information therein, Engeny will rely upon this provision as a defence to any such claim or demand.
- (g) This Report does not provide legal advice.

APPENDIX A: MAXIMUM FLOOD DEPTH





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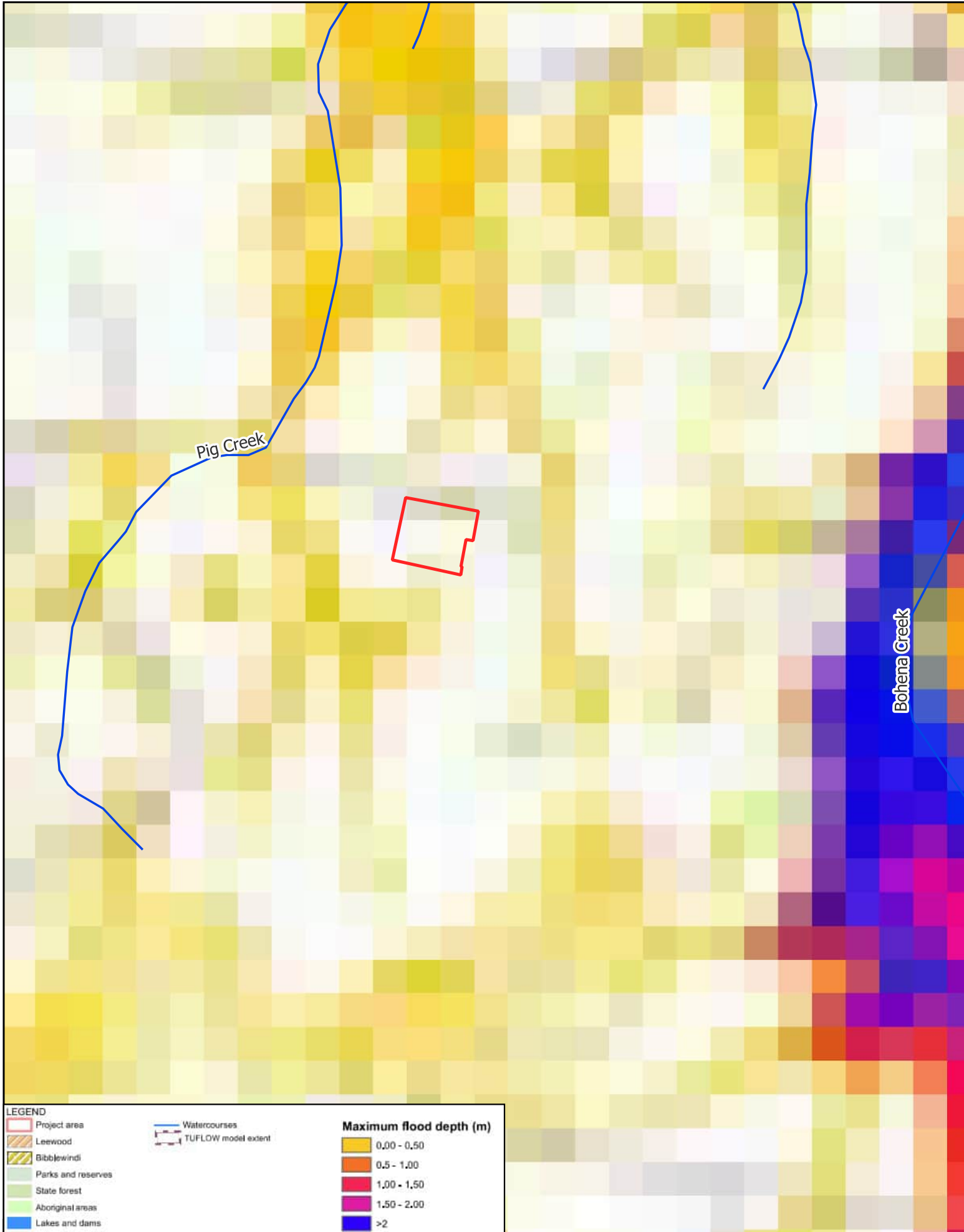
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia
Vertical Datum: Australia Height Datum
Grid: Map Grid of Australia, Zone 56

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Figure A1: 10% AEP Maximum Flood Depth

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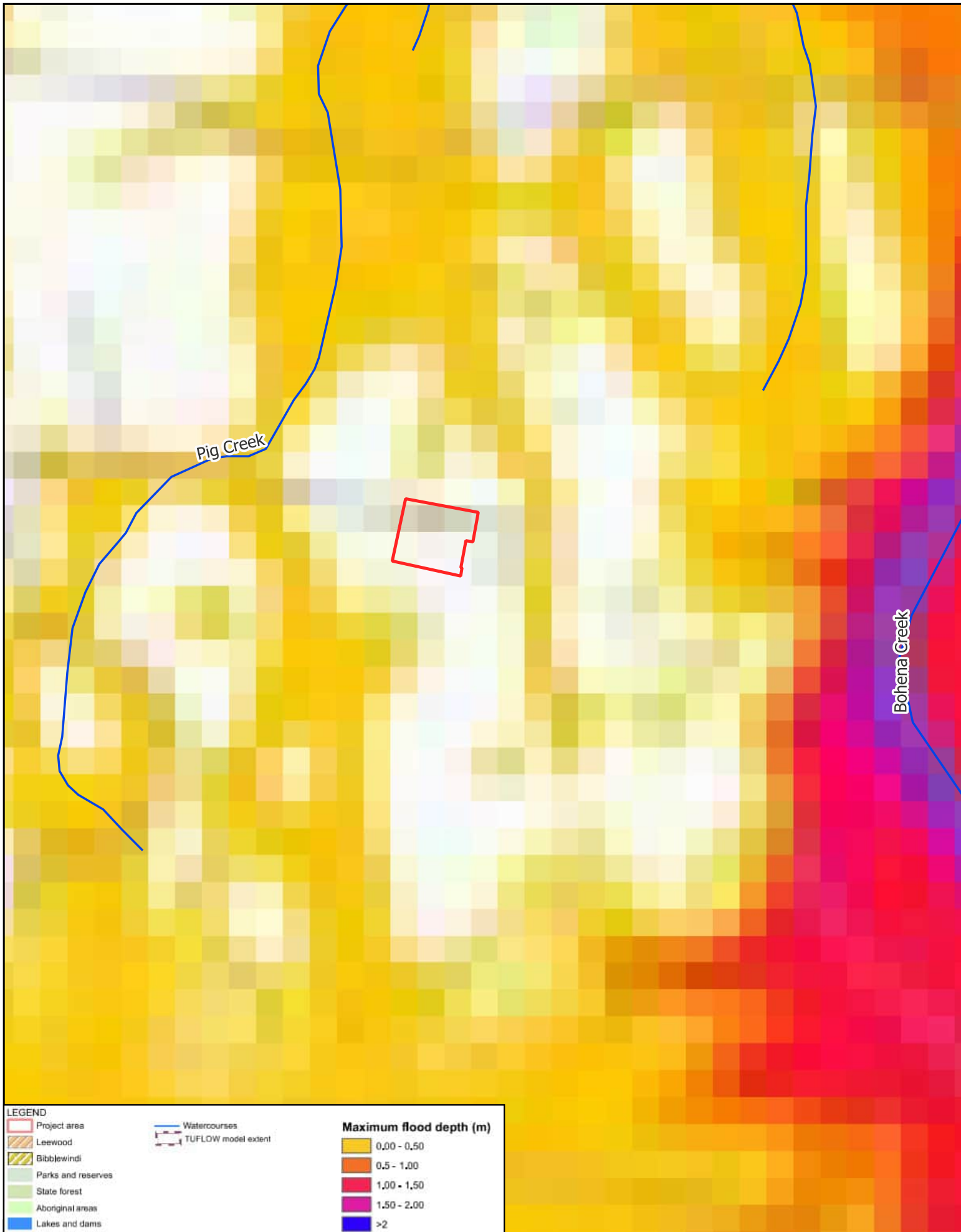
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Horizontal Datum: Geocentric Datum of Australia
Vertical Datum: Australia Height Datum
Grid: Map Grid of Australia, Zone 56

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Figure A2: 1% AEP Maximum Flood Depth

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LEGEND

Project area
Leewood
Bibbiewindi
Parks and reserves
State forest
Aboriginal areas
Lakes and dams

Watercourses
TUFLOW model extent

Maximum flood depth (m)

0,00 - 0,50
0,5 - 1,00
1,00 - 1,50
1,50 - 2,00
>2