Review of Environmental Factors

Bore 2 Replacement, Forbes

Prepared for Parkes Shire Council

March 2023

PARKES SHIRE COUNCIL

The Environmental Factor

Review of Environmental Factors – Bore 2 Replacement

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This Report has been prepared by The Environmental Factor (TEF) at the request of Parkes Shire Council (PSC or Council) to assess the matters affecting or likely to affect the environment by reason of the proposed Proposal to establish a new production bore to replace existing Parkes 'Bore 2', in order to secure ongoing access to underground water within the Upper Lachlan Alluvial Aquifer. This document is not intended to be utilised or relied upon by any persons other than PSC, nor to be used for any purpose other than that articulated above. Accordingly, TEF accepts no responsibility in any way whatsoever for the use of this report by any other persons or for any other purpose.

The information, statements, recommendations, and commentary (together the "Information") contained in this review have been prepared by TEF from material provided by PSC and NSW Department of Planning and Environment (DPE), including available databases, and collected through the assessment process.

This report has been developed in accordance with the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), the NSW *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) and the Department of Planning and Environment's (DPE) Guidelines for Division 5.1 assessments (DPE Guidelines). It demonstrates how the environmental factors specified in the DPE Guidelines (which adopt the factors specified in section 171(2) of the EP&A Regulation) were taken into account when considering the likely impact of the proposed activity. TEF has not sought any independent confirmation of the reliability, accuracy or completeness of this information. It should not be construed that TEF has carried out any form of audit of the information which has been relied upon.

Accordingly, whilst the statements made in this report are given in good faith, TEF accepts no responsibility for any errors in the information provided by DPE or PSC nor the effect of any such errors on the analysis undertaken, suggestions provided, or this report. TEF does not accept responsibility arising from, or in connection with, any change to the site conditions. TEF is also not responsible for updating this report if site conditions change.

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Abbreviations

Abbreviation	Description
ADD	Aboriginal Due Diligence
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AOBV	Areas of Outstanding Biodiversity Value
ASL	Australian Landscape Soils
ASS	Acid Sulfate Soil
BOS	Biodiversity Offsets Scheme
BC Act	*Biodiversity Conservation Act 2016*
CEMP	Construction Environmental Management Plan
CNSWJO	Central NSW Joint Organisation
CTW	Central Tablelands Water
DCCEEW	Department of Climate Change, Energy, Environment and Water
DEE	Department of Environment and Energy
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EPA	Environmental Protection Authority
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
ERPS	Eugowra Road Pump Station
ERSED	Erosion and Sediment
EPL	Environmental Protection License
FM Act	*Fisheries Management Act 1994*
FSC	Forbes Shire Council
KTP	Key Threatening Process
LGA	Local Government Area
LRPS	Lachlan River Pumping Station

Abbreviation	Description
ML	Mega Litres
MNES	Matters of National Environmental Significance
NSW	New South Wales
OEH	Office of Environment and Heritage (now DPE)
PCT	Plant Community Type
POEO Act	*Protection of the Environment Operations Act 1997*
PSC	Parkes Shire Council
PMO	Project Management Office
PWSP	Parkes Water Security Program
SAP	Special Activation Precinct
SEED	Sharing and Enabling Environmental data
REF	Review of Environmental Factors
TEC	Threatened Ecological Community
TEF	The Environmental Factor
ToS	Tests of Significance
WAL	Water Access Licence
WoNS	Weed of National Significance
WSP	Water Sharing Plan
WTP	Water Treatment Plant

Executive Summary

This Review of Environmental Factors (REF) has been prepared by The Environmental Factor (TEF), on behalf of Parkes Shire Council (PSC or Council). The report presents findings of the investigations undertaken into matters affecting or likely to affect the environment by reason of the proposal to undertake 'replacement groundwater works', including:

- Installation of a replacement production bore adjacent the existing Parkes Bore 2,
- Completion of pump test and distribution of up to 15ML of pump test water to the Northparkes Mine reservoir 1B via the existing Bore 2 pipeline, and temporary above ground poly pipe into the reservoir. No additional trenching or laying of permanent pipe is anticipated as part of this operation.
- Installation of connecting pipeline and electrical cables to existing infrastructure,
- Upgrades to the existing access track which passes through Crown Land,
- Operation of the replacement Bore once established, and
- Establishment of the decommissioned Bore 2 as a monitoring bore.

Located approximately 13 km east of Forbes NSW (hereafter 'the Proposal').

In accordance with requirements under the *Water Management Act 2000* (WM Act) and the Water Sharing Plan (WSP) for the Lachlan Alluvium, the replacement Bore 2 will be installed within 20 m of the existing Bore 2 (GW701690).

This report assesses matters affecting or likely to affect the environment within the framework of Division 5.1 of Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), and has in particular considered:

- Impacts on Matters of National Environmental Significance (MNES or protected matters) under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) (refer Section 5.1);
- matters affecting or likely to affect the environment in accordance with s 5.5 of the EP&A Act and the DPE Guidelines (refer Sections 3.2, and 4); and
- impacts on threatened species in accordance with s 7.8 of the *Biodiversity Conservation Act 2016* (BC Act) and Part 7A Division 12 of the *Fisheries Management Act 1994* (FM Act) (refer Sections 3.2.4, 3.2.5, 3.2.9 and 4.7).

Accordingly, this report identifies where proposed works could impact the surrounding environment and outlines appropriate safety measures (Environmental Safeguards) to be installed.

The study area is located within the locality of Forbes along The Escort Way, adjacent to the Lachlan River approximately 13 km east of the Forbes CBD. PSC proposes to sink a replacement production water bore on Lot 7301 DP 750183, immediately adjacent to the existing PSC Bore 2. The Proposal also includes excavation and trenching works to install pipes and electrical equipment to existing infrastructure and would have direct impacts on the existing access road, which will include removal of native vegetation, excavation and re-establishment of road-base material to ensure all-weather access to the site for machinery and personnel vehicles, and surface-level upgrades to an existing crossing of a minor waterway. The study area is located on Crown Land, with approval from the NSW Crown Lands department (Crown Lands) required prior to project commencement.

The Proposal will require drill rig and associated plant and vehicle access to the site and includes typical boring and casing methodology for water bore installation. The Proposal will also require trenching for pipes and electrical cable laying, and upgrades to the existing access road which passes through the Crown Land allotment and a first order waterway. Additional traffic movements, dust and noise emissions, indirect impacts to adjacent cultivated farmland, and minor indirect impacts to adjacent native vegetation is also expected as part of the works. These impacts are not anticipated to be significant provided Environmental Safeguards outlined within this REF and which are part of this Proposal are effectively implemented.

An area of approximately **0.53 ha** will be impacted by the Proposal. This area includes upgrades to the existing access track as described above, which may require minor vegetation removal and limb-lopping of overhanging trees along the track, and groundcover disturbance within a 50 by 50 m area at the bore location to allow for drilling activities, excavation, trenching and access works.

Groundcover vegetation to be impacted is predominantly compromised of exotic grasses and weed species. Within the subject site, particularly along the existing track and in the vicinity of the existing bore, ground cover vegetation has been highly degraded and modified by weed incursion, the previous construction of the bore and associated infrastructure, and ongoing, routine mechanical maintenance (slashing) at the site. Native vegetation on site is identified as PCT 5 *River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion*. River Red Gum (*Eucalyptus camaldulensis*) is the dominant canopy species within the subject site. The composition of the community occurs as a tall, open forest, with an open, grassy groundcover stratum dominated by exotic species. Some scattered Yellow Box (*Eucalyptus melliodora*) were also recorded in the study area; the River Red Gum forest PCT identified is likely grading into adjacent Box-Gum communities (Yellow Box) as the landscape extends away from the riparian area. No native shrubs were recorded in the subject site.

Threatened biota listed under the BC Act and EPBC Act (threatened biota) identified by database searches and field surveys that could potentially occur in the locality have been assessed for their 'likelihood of occurrence' and likelihood of being impacted by the Proposal in Appendix C. None of the threatened biota listed were recorded during the site surveys. The 'likelihood of impact' assessment completed concluded that risk of impacts to threatened biota was unlikely, with impacts restricted to the removal of predominantly exotic groundcover and some minor tree limb-lopping. No hollows or habitat trees will be removed as part of the road upgrade works. Subsequently, no threatened species, ecological communities, populations or their habitats listed under either the Commonwealth EPBC Act or the NSW BC Act are considered likely to be impacted by the Proposal. As such, assessments of significance (BC Act & EPBC Act) have not been prepared and a Species Impact Statement or a referral to the Minister for the Environment and Water is not required for this project.

One (1) Aboriginal heritage item has been identified as occurring approximately 650 m to the north-west of the study area, being the known Aboriginal artefact with AHIMS Site ID 43-3-0108 identified near the Lachlan River Pumping Station (LRPS). Given the proximity of a major river, and the presence of known Aboriginal artefacts in the area, an Aboriginal Due Diligence (ADD) assessment was completed by OzArk in February 2023. The undertaking of the due diligence process resulted in the conclusion that the proposed works will have an impact on the ground surface, however, no Aboriginal objects or intact archaeological deposits will be harmed by the proposal.

The Proposal forms a discrete and independent part of a broader program that aims to support greater water security within Parkes and throughout the Central West region, in particular for Councils and other water utilities that are included in the Central NSW Joint Organisation (CNSWJO). This initiative is aimed at supporting critical drinking water security and planned developments to the west of Parkes, including the Special Activation Precinct (SAP) and associated developments. The new bore would supply untreated bore water to the Parkes Water Treatment Plant (WTP) at a volume of no more than 1,100ML/year. As part of this broader program, the proposed Bore 2 replacement will help meet the water requirements of the program by providing upgraded bore infrastructure to replace the existing Bore 2 that is to be decommissioned from a production bore and converted to a monitoring bore, and by linking in with the nearby pump stations and other infrastructure to deliver water to Parkes.

The proposed installation of a replacement bore is anticipated to have positive long-term socio-economic benefits for the Parkes community, through securing ongoing access to underground water within the Upper Lachlan Alluvial Aquifer for current and anticipated growth, whilst ensuring the water extraction 'load' is spread across the aquifer to reduce localised impacts for other users. As the bore will be constructed to replace an existing bore to be decommissioned, no additional or cumulative impacts to other water users through draw-down on the aquifer is anticipated; the proposed Bore would be constructed and operated under Council's existing Water Access Licences (WALs).

All proposed work will be completed under the guidance of a Construction Environmental Management Plan (CEMP) to manage and minimise potential environmental impacts, particularly ecological impacts, associated with the proposed work. Once operational, the Proposal is not expected to cause any significant environmental or community impacts; rather, is it expected that the Proposal will have net positive impacts.

The Proposal is required to be assessed under Division 5.1 of Part 5 of the EP&A Act. This REF has examined and considered, to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the Proposal. Given the nature, scale and extent of impacts, and strict implementation of environmental safeguards outlined in this REF, the Proposal is unlikely to have a significant effect on the environment, including threatened species or ecological communities, or their habitats. As such it is not necessary for further assessment under section 5.7 of the EP&A Act. The Proposal is also unlikely to have a significant impact on any MNES or the environment on Commonwealth land for the purposes of the EPBC Act, therefore a referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEW) is not required.

1 Introduction

1.1 Overview

The Environmental Factor (TEF) has been engaged by Parkes Shire Council (PSC or Council) to undertake a Review of Environmental Factors (REF) to fully consider the environmental issues relating to the proposed installation of a replacement production bore on Lot 7301 DP 1151718 and associated ancillary works, in the Forbes Shire Council Local Government Area (LGA), NSW, as part of the broader Parkes Water Security Program (PWSP) (hereafter 'the Proposal').

The Proposal consists of sinking a replacement production bore immediately adjacent to the existing PSC Bore 2, and excavation and trenching works to facilitate the installation of additional pipework and electrical cabling to connect with the existing infrastructure at the site, as well as a complete refurbishment of the access track including excavation of sub-surface material, importing new road-base, upgrades to the waterway crossing and widening through minor limb-lopping and removal of exotic groundcovers. The existing electrical switch room will be decommissioned and replaced with a new electrical switch. Operation of the replacement bore will include extraction of up to 3.1 ML / day for inclusion in the Parkes Water Supply Scheme, and routine maintenance of the access road, new electrical switch room and telemetry systems as required.

The study area is located on Crown Land, with approval from Crown Lands required prior to development project commencement.

As part of recent audits and separate works packages being progressed, it has been identified that the existing Bore 2 is currently not financially viable to be repaired due to the extensive nature of existing damage. Consequently, Council is proposing to convert the existing Bore 2 to a monitoring bore, and installing a replacement bore adjacent to the existing Bore 2 site using funding received under the Critical Drought Relief fund supplied by the NSW State Government. Consequently, the existing Bore 2 will not be decommissioned, however maintained as a monitoring Bore once approval has been granted by DPE Water.

This REF has been completed in accordance with Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation). This REF assesses the matters affecting or likely to affect the environment by reason of the Proposal, including an assessment of impacts on environmental values, threatened ecological communities, and populations and species listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and Matters of National Environmental Significance (MNES) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.2 Project Background

Parkes Shire is experiencing an increased demand on existing water supply from changing climatic conditions coupled with significant growth in the industrial and residential sectors. This has led Council to propose a series of independent strategic water infrastructure initiatives aimed at supporting greater water security within Parkes and throughout the central west region as part of the proposed future Special Activation Precinct (SAP) developments. This is known as 'the Program'.

The Program is roughly divided into six (6) distinct, standalone proposals (TEF 2020) updated according to various funding streams and works programs, including the following:

- **Eugowra Road Pump Station to Forbes Bore 3 Pipeline:** Construction of approximately 9 km of new pipeline connecting the existing Eugowra Road Pump Station (ERPS) to the Forbes Bore 3.
- **Eugowra Road Pump Station to Gooloogong Pipeline:** Construction of a new 39 km rising main (RM) from the ERPS to the Gooloogong Bores Reservoir.
- **Parkes Borefield Refurbishment:** The refurbishment existing Parkes bores.
- **Lachlan to Parkes Water Supply Duplication and Pump Station Augmentation**
- **LRPS augmentation and pre-treatment plant:** The construction and operation of a pre-treatment plant for raw river water at the Lachlan River Pump Station or the Back Yamma Pump Station, as well as a distribution reservoir.
- **Lachlan Pipeline Duplication, including new ERPS and Akuna Road PS and solar systems:** The augmentation or replacement of approximately 30 km of raw water transfer pipeline from the Lachlan River Pump Station to the Parkes Water Treatment Plant. The Proposal would also include the construction and operation of a pre-treatment plant for raw river water at the Lachlan River Pump Station or the Back Yamma Pump Station, as well as a distribution reservoir.
- **Parkes WTP Raw Water Storage Dam (RWSD):** construction of a ~20 ML dam immediately north of the existing WTP in Parkes; and
- **'Tallawalla' Bore:** establishment of a new bore on the property 'Tallawalla' to the west of Forbes along The Escort Way, adjacent to the existing LRPS and proposed pre-treatment facility (Proposal 4b above). Test drilling to date at the Ulmarra property returned results inconsistent with the objectives of the work program, and therefore the preferred bore location has been relocated to the Tallawalla property.

While Council has determined to undertake maintenance activities for Bore 1 to ensure its ongoing viability, Bore 2 will remain inactive for the time being as it requires significant improvements which are currently not financially viable; this leaves Parkes with a shortfall in accessibility to valuable groundwater resources needed for the towns' water supply.

The establishment of the replacement bore immediately adjacent to Bore 2 will relieve this shortfall and spread the extraction load across the alluvial aquifer to reduce the risk of draw down for Parkes and other users.

1.3 Project Objectives

The primary goal of the Proposal is to tie in with broader PWSP proposals in the locality in providing greater water security within Parkes and throughout the central west. The secondary objectives are to achieve this goal with minimal impact to native biota. This will be executed through thorough pre-commencement impact boundary delineation, and site inductions for work personnel.

1.4 Site Description

The study area, located on Crown land identified as Lot 7301 DP 1151718 and Lot 1 DP 105112, commences approximately 13 km along The Escort Way, immediately south of the intersection

between Fairview Road and The Escort Way along the banks of the Lachlan River. The study area is comprised primarily of vegetated land identified as PCTID 5: River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion. and cleared agricultural cropping land with scattered paddock trees (refer Figure 1). The subject site contains an intact overstory dominated by River Red Gum (*Eucalyptus camaldulensis*) with some Yellow Box (*Eucalyptus melliodora*) occurring scattered throughout the subject site away from the riparian area, to the north along the access track. River Red Gum trees in the study area are predominantly mature, old growth trees containing a large number of hollows, which are medium to large in size (> 15 cm).

One (1) threatened species, Brown Treecreeper (*Climacteris picumnus victoriae*), has been recorded within 100 m of the Proposal. A further fifteen (15) threatened species are known to occur within 10 km of the Proposal location (refer Figure 11).

Table 1 Site Details

Site details	
Road name / Property name Lot /DP	The Escort Way, Forbes NSW Lot 7301 DP1151718 Lot 1 DP105112
Closest crossroad(s)	Fairview Road, Twelve Mile Road
Sensitive Receivers (1km radius)	Lot 1 & Lot 7301 DP 105112 (Subject Site) Lot 7301 in DP 1151718 Lot 281 in DP 607976 Lot 81 in DP 750183 Lot 67 in DP 1019030 Lot 282 in DP DP607976 Lot 71 in DP1044803 Lot A in DP 389146 Lot 6, 97 & 99 in DP750183 Lot 120 in DP 1227243 Lot 2 in DP 865926 Lot 1 in DP 639867 Lot 46 in DP 750183 Lot 18 in DP 750183 Lot 10 in DP 737008
Land zoning	RU1 – Primary Production
IBRA region	South West Slopes
IBRA sub region	Lower Slopes

Table 2 Site Details

Term	Description
Subject site	The area to be directly affected by the Proposal, including earthworks and vegetation clearing includes: **50 m** by **50 m** area around the bore site to account for drilling activities and excavation and trenching works **685 m** by **4 m** wide length access road to be directly impacted due to the movement of vehicles and machinery**.** A total area of **0.52 ha** (Figure 1).
Study area	Includes the subject site (as described above) and any proximal areas that could be potentially directly or indirectly impacted by the Proposal. For the purposes of this report the study area has included a buffer area of **25 m**. Measuring a cumulative **4.60 ha** of which native vegetation equals **2.25 ha** (Figure 1, Figure 9).
Locality	Is the area within 10 kilometres of the subject site (Figure 1).

2 Proposal Description

The Proposal, as assessed herein, constitutes the sinking of a new bore immediately to the north west of the existing Bore 2 on Lot 7301 DP 1151718. Council proposes to drill to the intersection with the Upper Lachlan Alluvial Aquifer, estimated to be at approximately 121 m depth (as per the recorded depth of the existing Bore 2). The Proposal also involves upgrades to the access road, excavation and trenching works to facilitate the installation of additional pipe, additional electrical switch room and building and electrical cabling.

Specifically, the following activities will be undertaken as part of the proposal:

- **Bore 2 Replacement**
  The proposed bore is considered a 'Replacement Bore' under the provisions of the Water Sharing Plan for the Lachlan Alluvial Groundwater Sources Order 2020, therefore design specifications are to replicate the existing Bore 2 in terms of diameter, depth, length of screens, and be within 20 m of the existing bore.
  Council proposes to engage a licensed driller and contractors to sink the bore hole.
  Separate Contractors will be engaged to complete piping and electrical works. The new electrical switch room will be located on stilts at the same relative level (RL) as the existing electrical switch board. A temporary construction impact zone of 50 m^2 around a level drill pad will be required. The direct impact areas (the subject site) have a 25 m indirect impact area applied (the study area).
  Additionally, up to 15 ML of groundwater will be generated during a 72 hr water flow rate testing (pump test) period of the production bore. The groundwater discharge will ultimately be discharged to the Northparkes Mine 1B reservoir following casing, screening, and flushing of the replacement bore. The groundwater discharge will be distributed using the existing Bore 2 pipeline, and discharged up and over into the reservoir using temporary poly pipe. No additional trenching is anticipated.

- **Access track refurbishment and waterway crossing**
  The current access track will be upgraded within its existing alignment. The full length of the road will be excavated to a depth of 200 mm and a nominal width of 4 m. In addition to this, three (3) passing bays will be nominated within areas that are already cleared of canopy vegetation. Excavated material will be tested for contamination, and then transported for beneficial reuse offsite, depending upon the results of the testing.
  The existing waterway crossing will be retained, with the approach and departure areas supplemented with additional rock of DN 50 – 100 mm to ensure the surface remains free draining.

- **Operation and maintenance**
  Once operational, the Bore is anticipated to extract up to 3.1ML of water per day. This extraction limit is within current water entitlements (refer Section 3.3 for details on existing Water Licences).
  Routine maintenance of the replacement Bore 2 and upgraded access track is likely to be limited to infrequent access to the site by Operations staff in light personnel vehicles. This is anticipated to be equivalent to current maintenance and site access levels.

The following sections provide further detail on relevant aspects of the Proposal, including design development, options selection and proposed construction and operation activities as they apply to the proposed works.

Concept drawings have been included as Appendix A.

2.1 Design principles

The core principle for the design and implementation of the proposed water bore are to secure ongoing access to underground water within the Upper Lachlan Alluvial Aquifer, with minimal impact to the surrounding native biota and other water users, by undertaking replacement groundwater works in the location of an existing Bore.

It is proposed that typical water bore drilling machinery and auxiliary equipment will be used throughout the proposed sinking of the bore. Likewise, the proposed excavation and trenching for the pipes and electrical cabling will involve typical construction machinery and methodology for each aspect, respectively. The number of personnel on the site will vary depending on the phase of construction and drilling. Stockpiles and construction amenities as appropriate would be established within precleared areas within the subject site. Material removed from the bore hole would be bagged and removed from the site for appropriate disposal. Any water encountered during the drilling operations would be captured in an appropriately lined sump and disposed of appropriately off site.

2.2 Justification for the proposed works

Council has identified the need to either refurbish or replace the existing Borehole 1 and 2 (Water NSW bore number GW021254 and GW701690 respectively), in order to secure ongoing access to underground water within the Upper Lachlan Alluvial Aquifer. Boreholes 1 and 2 together provide less than 12% of the total capacity of the Councils' borefield (Bores 1-8) and require significant investment to bring the bores (installed in 1966) up to acceptable standards.

While Council has determined to undertake maintenance activities for Bore 1 to ensure its ongoing viability, the existing Bore 2 will remain in its current non-productive state, and will eventually be converted for use as a monitoring bore following approval from DPE Water; this leaves Parkes with a shortfall in accessibility to valuable groundwater resources needed for the towns' water supply.

The replacement of Bore 2 in the immediate vicinity will relieve this shortfall and spread the extraction load across the alluvial aquifer to reduce the risk of draw down for Parkes and other users.

2.3 Options Considered

Several options were considered regarding the options of the refurbishment or replacement of Bore 2, including:

Option 1: Refurbish Bore 2

A downhole camera inspection of Bore 2 was completed on 30th June 2022. The inspection found that the screens within the hole were blocked over two (2) intervals, and mechanical cleaning in addition to a chemical clean of the hole is required. Furthermore, while no holes were observed in the steel casing, it was noted the steel casing is highly corroded. The bore log indicates there is no concrete

below 72 m depth, therefore if the steel casing does develop a hole due to the corrosion, there is a high risk of surrounding formation material entering the bore. To eliminate the risk of contamination from surrounding material entering the hole the bore would require relining. It has been identified that Bore 2 is currently not financially viable to be repaired.

Option 2: Replace Bore 2 within proximity to the existing bore

Under the Water Sharing Agreement the definition of a 'Replacement Bore' is a bore that duplicates the existing bore in terms of having the same diameter, depth, length of screens, and sits within 20m of the existing bore. The area around the existing bore 2 is suitable for a replacement bore, with existing infrastructure available to connection to the greater PWSP.

Replacing Bore 2 involves completing a 72 hour pump test, resulting in an anticipated discharge of up to 15ML of water. The discharge would be either be reticulated to the Northparkes mine reservoir 1B, or discharged to the environment. The latter would require a miscellaneous discharge permit from the NSW EPA under the POEO Act. Council considers discharging to the Northparkes mine reservoir the preferrable option.

Option 3: Replace Bore 2 with a new bore on the 'Ulmarra' property

A new bore on the 'Ulmarra' property approximately 1.6 km to the north west is considered an option for the following reasons:

- it is the recommended location from the hydrogeological studies (CMJA 2020);
- it is directly above the Upper Lachlan Alluvial Aquifer;
- the location abides by the distance requirements from existing bores;
- it will not require any modifications to property boundaries; and
- it occurs on Council owned land.

However, in February 2022, a test bore at the preferred location on the Ulmarra property was completed and the test bore did not yield any water; subsequently, a new test bore has been progressed on the adjacent property at Tallawalla in February 2023 which has been successful.

2.3.1 Preferred Option

PSC elected to proceed with 'Option 2' to replace the existing bore 2, given the prohibitive cost of repairing the existing bore. PSC are further investigating sinking an additional bore within the locality of the existing borefield, including on the Ulmarra property, with the objective of spreading the extraction load over the Lachlan Aquifer, under the provisions of the WAL.

2.4 Environmental Safeguards

Throughout the environmental assessment undertaken in relation to the above Proposal, potential impacts on the environment were identified, in relation to the following environmental 'categories':

- Applicable Acts and legislation
- Soils and Erosion
- Waterways
- Noise and Vibration

- Air Quality and Odour
- Non-Aboriginal Heritage
- Aboriginal Heritage
- Biodiversity
- Traffic and Transport
- Socio-economic Considerations
- Waste and Resource Use
- Visual Amenity
- Climate Change

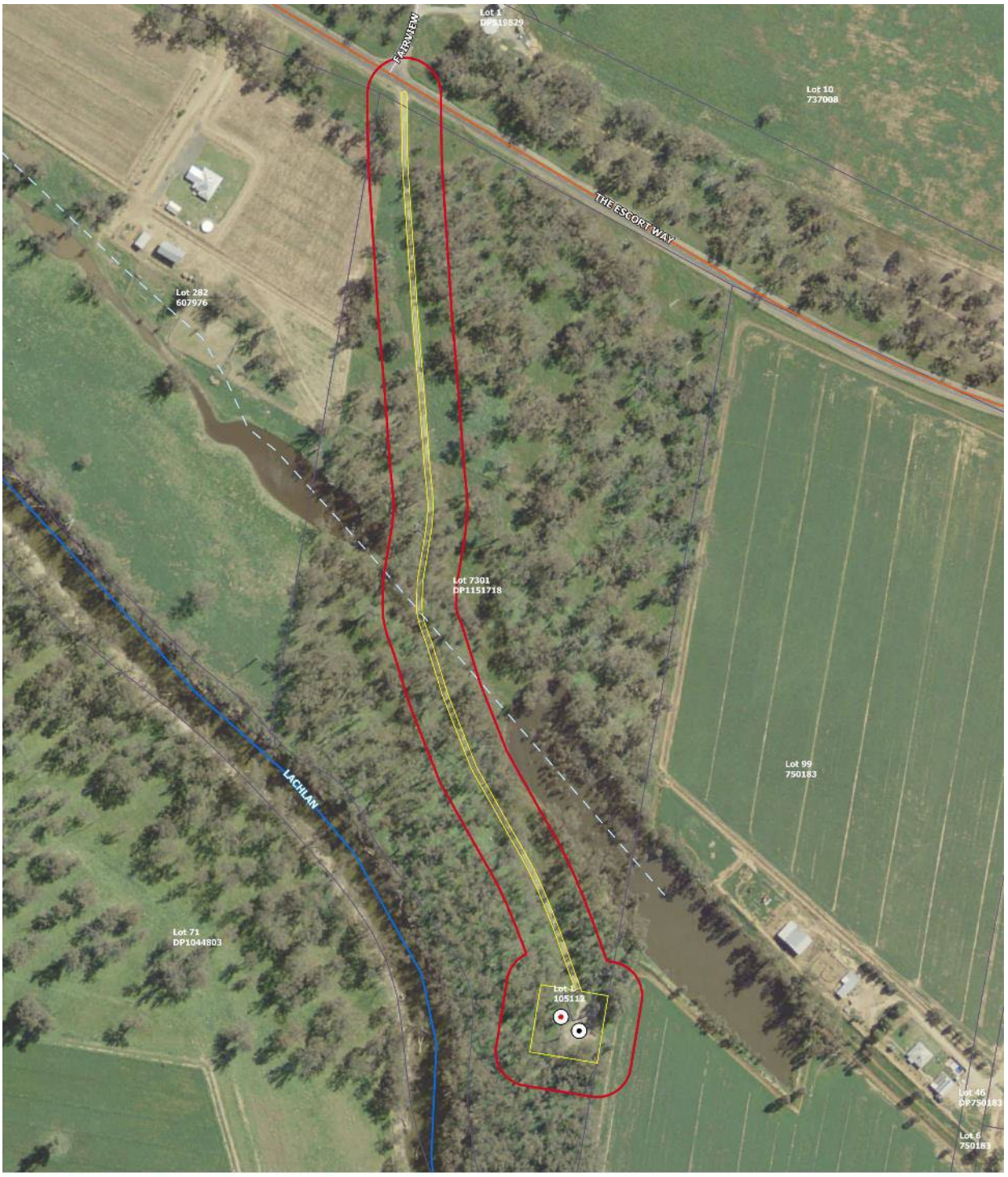
Environmental Safeguards were then developed to address each of the identified impacts, to ensure that the residual impact upon the environment would not be significant. These Safeguards form part of the Proposal and will be implemented as part of delivery of the Proposal (Appendix D). With these environmental protection measures, the Proposal does not have the potential to result in significant impacts within the above categories, which would have environmental, social and economic consequences for Council, as the consent authority for these works.

Table 3 Types of works relevant to the Proposal

Types of works	Comments
Site preparation works	• Site demarcation. • Clearing of vegetation along access road and adjacent to the new bore 2 location. • Stockpiling and removal of green waste material. • Minor upgrades to access routes for excavation and construction equipment, including placement of signage. • Establishment of layby areas, storage facilities and site office.
Drilling	• Drilling to approximately 121 m depth using machinery typically used for water bore activities • Casing with 457mm outside diameter and 323mm inside diameter, consistent with the existing bore
Bore establishment and Pump test	• Clean the bore by flushing the dirty water from the newly constructed bore into tanker/s for disposal at licenced facility. • Test water to ensure quality sufficient for inclusion in existing system for distribution to Northparkes Mine. • Connect temporary pipework to the Northparkes Reservoir 1B. • Continue pump test with test water to be used beneficially for supply to Northparkes Mine.
Preparation of trench	• Grubbing and stripping of topsoil. • Excavation of the proposed alignment for pipeline placement, using standard trenching techniques. • Site preparation including excavation and depositing soil/sand to achieve correct ground levels for pipeline install. • Stockpiling and removal of waste material including soil, road base and concrete.
Laying of pipeline and electrical conduit to existing infrastructure	• Laying pipe in newly formed trench and connecting to existing water supply network. • Backfilling trench and all excavated areas.

Types of works	Comments
Site rehabilitation works	• Site restoration works to achieve correct levels to stabilise and prevent erosion. • Disposal of excess fill material. • Spreading seed, planting trees as per site restoration plan. • Monitoring of site to ensure revegetation measures are effective and no major erosion or long-term ecological damage occurs as a result of construction works.

Establishment of the monitoring bore	• Disconnection of the existing production bore pipework to effectively discontinue water transfer.
	• Construction of a lockable monument with the following specifications:
	  ○ A concrete plinth / apron around the bore of minimum 300 mm x 300 mm depth (below ground surface).
	  ○ The monument shall be a minimum 400 mm above the ground surface. A minimum depth of burial of 300 mm is required.
	  ○ The annulus between the monument and the bore casing should be backfilled with gravel to discourage spiders nesting.
	  ○ A PVC end cap is to be fitted to each bore to prevent the entry of foreign materials or vermin. The bed cap shall have a slot cut into the top to provide air or gas release. The ends to the cap shall be chamfered to enable easy fitting of the cap to the monitoring bore. The bore identification shall be marked both on top of, and inside this PVC cap.



PSC Bore 2 Replacement - Subject Site and Study Area

Legend

- Proposed Bore 2
- Existing Bore 2
- Subject Site
- Study Area
- Lot Boundaries

Roads

- Arterial Road
- Local Road

Waterways

- Creek
- River
- 1st & 2nd order; unnamed waterways

N

0 50 100 150 m

1 : 3,500

Figure 1 Study area and subject site

Figure 2 Regional context and land zoning

3 Legislative Context

The following legislation, policies and guidelines applicable to the REF have been reviewed, and the implications have been assessed accordingly as part of this REF.

3.1 Commonwealth (Federal) Legislation

3.1.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act ensures that actions likely to cause a significant impact on Matters of National Environmental Significance (MNES or protected matters) undergo an assessment and approval process. Under the EPBC Act, an action includes a proposal, undertaking or activity. An action that 'has, will have or is likely to have a significant impact on a matter of national environmental significance' is deemed to be a 'controlled action' and may not be undertaken without prior approval from the Australian Government Minister for the Environment (the 'Minister').

MNES include:

- World Heritage properties
- National Heritage places
- Wetlands of international importance
- Listed threatened species and ecological communities
- Listed migratory species
- Commonwealth marine areas
- Nuclear actions

The EPBC Act has been addressed in the current assessment through:

- desktop review to determine the MNES that are predicted to occur within the locality of the proposed scheme and hence could occur, subject to the habitats present;
- general field surveys for threatened biota and migratory species listed under the Act;
- identification of suitable impact mitigation and environmental management measures for threatened biota, where required; and
- assessment of potential impacts on MNES, if appropriate.

Potential impacts on relevant MNES must be subject to Tests of Significance pursuant to the EPBC Act Significant Impact Guidelines (DEWHA 2009). If a significant impact is considered likely, a referral under the EPBC Act must be submitted to the Commonwealth Minister for Environment.

This REF assesses the likelihood of MNES occurring within the locality of the Proposal, and their potential to be impacted by the Proposal (refer Section 4.7). No EPBC Act listed biota are considered at risk of impact as a result of the proposal. As such, Significant Impact Criteria Assessments were not required.

3.2 State (NSW) Legislation, Policies and Guidelines

3.2.1 State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure SEPP)

The Transport and Infrastructure SEPP consolidates and repeals the provisions of 4 SEPPS, which includes the previous *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP). The SEPP consolidation is administrative, and no policy changes have been made. It has been undertaken in accordance with section 3.22 of the *Environmental Planning and Assessment Act 1979*. As with the previous version, the Transport and Infrastructure SEPP aims to facilitate the effective delivery of infrastructure across the State, including for:

- Flood mitigation work (Division 7)
- Parks and other public reserves (Division 12)
- Roads and road infrastructure facilities (Division 17)
- Sewerage systems (Division 18)
- Soil conservation works (Division 19)
- Stormwater management systems (Division 20)
- Water supply systems (Division 24)
- Waterway or foreshore management activities (Division 25)

Section 2.159(1) states that 'Development for the purpose of water reticulation systems may be carried out by or on behalf of a public authority without consent on any land'.

Section 2.159(6) states that a reference to development for the purpose of water supply systems of any kind includes a reference to development for any of the following purposes if the development is in connection with the water supply system—

a) dams, reservoirs, weirs, levees, spillways and fishways,
b) catchment management works,
c) groundwater investigation works, groundwater bore stations, borefields, minewater works and the like,
d) access ways,
e) water intakes, pumping stations, pipelines, channels, tunnels, canals and aqueducts,
f) gauging and monitoring equipment,
g) power supply to the water supply system,
h) hydro-electric power generation equipment and associated connections to the electricity network,
i) construction works,
j) emergency works and routine maintenance works,
k) environmental management works,
l) schemes for the reuse of water treatment residuals,
m) maintenance depots.

The Dictionary to the *Standard Instrument—Principal Local Environmental Plan 2006* provides a water reticulation system is a type water supply system.

The Proposal, which includes the sinking of a water bore, upgrading an access track and trenching works to install pipes and electrical equipment to existing infrastructure, comprises development for the purposes described under section 2.159 (6)(c), (d), (i) and (j).

The purpose of the Proposal is to secure ongoing access to underground water within the Upper Lachlan Alluvial Aquifer, as part of the PWSP.

On that basis, the Proposal may be carried out without development consent under section 2.159(1) of the Transport and Infrastructure SEPP, and must be assessed as an activity under Division 5.1 of the EP&A Act.

The Proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not affect land or development regulated by *Coastal Management Act 2016, State Environmental Planning Policy (Coastal Management) 2018* (which repealed *State Environmental Planning Policy No. 14 – Coastal Wetlands, State Environmental Planning Policy No 71 – Coastal Protection and State Environmental Planning Policy No. 26 – Littoral Rainforests*) or *State Environmental Planning Policy (State Significant Precincts) 2005* (formerly known as *State Environmental Planning Policy (Major Projects) 2005*).

3.2.2 Environmental Planning and Assessment Act 1979 (EP&A Act) and the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation 2021)

The *Environmental Planning and Assessment Act 1979* (EP&A Act) forms the legal and policy platform for the assessment and approval of works in NSW and aims to ensure that public authorities examine and consider, to the fullest extent possible, all matters affecting or likely to affect the environment before they undertake or approve activities that do not require development consent.

All development in NSW is assessed in accordance with the provisions of the EP&A Act and the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation). Clause 171 (2) of the EP&A Regulations requires determining authorities to take into account the environmental factors specified in the environmental factors guidelines that apply to the activity, namely the Proposal. The relevant environment factors guidelines are the Department of Planning and Environment's Guidelines for Division 5.1 assessments (DPE REF Guidelines).

The Proposal is being assessed under Part 5 of the EP&A Act, as outlined above. In accordance with s 5.5 of the EP&A Act, an REF examines and considers, to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the proposal. In considering the likely impact of the proposal on the environment, the REF must consider the factors set out in cl 228 of the EP&A Regulation.

Section 1.7 of the EP&A Act lists factors that must be considered in the determination of the significance of potential impacts of a proposed activity on threatened species, populations or ecological communities (or their habitats) listed under the BC Act and the FM Act. Section 1.7 of the EP&A Act was addressed as part of the current assessment through the preparation of a Likelihood of Occurrence table for threatened species (Appendix C) as well as assessment on potential impacts on biodiversity (Section 4.7). Subsequently, no threatened species, ecological communities, populations or their habitats listed under either the Commonwealth EPBC Act or the NSW BC Act are considered

likely to be impacted by the Proposal. As such, assessments of significance (BC Act & EPBC Act) have not been prepared and a Species Impact Statement or a referral to the Minister for the Environment and Water is not required for this project.

This REF has identified that the Project is not likely to significantly affect the environment (Section4); as such, Council will not need to obtain and consider an Environmental Impact Statement (EIS) before it carries out the works (s 5.7 of the EP&A Act).

3.2.3 State Environmental Planning Policy (Biodiversity and Conservation) 2021

Chapter 3 of the *State Environmental Planning Policy (Biodiversity and Conservation) 2021* applies to Koala habitat protection. This chapter of the Biodiversity and Conservation SEPP 2021 only applies to proposals under Part 4 'Development' of the EP&A Act. The Proposal is being assessed under Part 5 of the EP&A Act, therefore this chapter of the Biodiversity and Conservation SEPP does not apply to the Proposal and this has not been considered further in preparation of this REF.

However, the Koala is listed as a Vulnerable species under the BC Act and EPBC Act, and thus also requires assessment under these Acts. This has been undertaken in Section 4.7. The Likelihood of Occurrence Assessment concluded that the risk of impact to this species as a result of the proposed works is Low, therefore a Test of Significance has not been completed for Koala.

3.2.4 Biodiversity Conservation Act 2016 (BC Act)

Section 7.2 and 7.8 of the *Biodiversity Conservation Act 2016* (BC Act) states that the determining authority must consider the effect of an activity on:

- areas of Outstanding Biodiversity Value (AOBV); and/or
- species, populations or ecological communities, or their habitats and whether there is likely to be a 'significant effect' on those species, populations or ecological communities.

The BC Act provides legal status for biota of conservation significance in NSW. It provides a framework for the Biodiversity Assessment Method (BAM) and the calculation of offset requirements for projects participating in the Biodiversity Offset Scheme (BOS).
The BC Act aims to:

- Conserve biological diversity on a bioregional and state scale;
- Lists Areas of Outstanding Biodiversity Value (AOBV);
- Assess the extinction risk of species and ecological communities;
- Identify Key Threatening Processes;
- Slow the rate of biodiversity loss; and
- Conserve threatened species.

Section 4.7 and Appendix C of this REF addresses potential impacts to Biodiversity and Threatened Ecological Communities (TEC) covered under the BC Act. No significant impact is considered likely as a result of the Proposal.

3.2.5 Biodiversity Conservation Regulatory Act 2017 (BC Regulatory Act)

The *Biodiversity Conservation Regulation 2017* provides a number of considerations and practices to be implemented as part of the BC Act, as follows:

- Identifies clearing thresholds and the Biodiversity Values Map for the application of the Biodiversity Offsets Scheme (BOS),
- Outlines principles for serious and irreversible impacts (SAII) to biodiversity,
- Rules for meeting biodiversity offset obligations, and
- Biodiversity certification criteria.

The Proposal is being assessed under Division 5.1 of the EP&A Act, consequently Council is exempt from compulsory participation and can elect to voluntarily participate in the Biodiversity Offset Scheme if desirable.

The following list describes the other triggers which may warrant participation in the BOS, additional to the trigger of the assessment pathway:

1. **Biodiversity Values Map**
   The Biodiversity Values Map (BVM) shows that there are areas of both protected riparian land and identified old growth forest within the subject site. However, as the Proposal is being assessed under Part 5 of the EP&A Act, participation in the BOS is not required.
2. **Area Criteria Threshold**
   Native vegetation clearing thresholds as outlined in Part 7 of the Biodiversity Conservation Regulation 2017 (Table 4) indicates when a project would need to enter the BOS according to the below minimum lot sizes and the corresponding native clearing thresholds.
3. **Areas of Outstanding Biodiversity Value**
   The presence of listed Areas of Outstanding Biodiversity Value (BC Act) on site would require participation in the BOS. No listed AOBV occur on Subject site.

Table 4 Area criteria - Biodiversity Offset Scheme threshold

Minimum lot size	Threshold for clearing (ha) to enter BOS
<1 ha	>0.25
1 ha < 40 ha	>0.5
40 ha – 1000 ha	>1
>1000 ha	>2

3.2.6 Protection of the Environment and Operations Act 1997 (POEO Act)

The *Protection of the Environment Operations Act 1997* (POEO Act) is administered by the Environment Protection Authority (EPA), which is an independent statutory authority and the primary environmental regulator for NSW. The POEO Act regulates and requires licensing for environmental protection, including for waste generation and disposal, and for water, air, land and noise pollution.

The objects of this Act are as follows—

(a) to protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development,

(b) to provide increased opportunities for public involvement and participation in environment protection,

(c) to ensure that the community has access to relevant and meaningful information about pollution,

(d) to reduce risks to human health and prevent the degradation of the environment by the use of mechanisms that promote the following—

(i) pollution prevention and cleaner production,

(ii) the reduction to harmless levels of the discharge of substances likely to cause harm to the environment,

(iia) the elimination of harmful wastes,

(iii) the reduction in the use of materials and the re-use, recovery or recycling of materials,

(iv) the making of progressive environmental improvements, including the reduction of pollution at source,

(v) the monitoring and reporting of environmental quality on a regular basis,

(e) to rationalise, simplify and strengthen the regulatory framework for environment protection,

(f) to improve the efficiency of administration of the environment protection legislation,

(g) to assist in the achievement of the objectives of the *Waste Avoidance and Resource Recovery Act 2001*.

The Proposal does not require a license or approval under the POEO Act; however, Council has considered obtaining a miscellaneous discharges permit from the EPA for disposal of the pump test water (up to 15ML) to the surrounding environment (either to land or water), with disposal of dirty water generated by Bore establishment to be transported to a licenced waste management facility. In the first instance, it is intended to ensure pump test water is reticulated into the Northparkes Reservoir 1B for beneficial use within the existing system, with the option to discharge to the environment via a permit only if required.

Additionally, consideration of measures for the prevention of water, air, land and noise pollution is provided herein (refer Sections 4.1, 4.2, 4.3, 4.4 and Appendix E

3.2.7 National Parks and Wildlife Act 1974 (NPW Act)

The NPW Act provides for the statutory protection of Aboriginal cultural heritage places, objects and features. This legislation aims to protect and preserve Aboriginal heritage values.

Part 6 of this Act refers to Aboriginal objects and places and prevents persons from impacting on an Aboriginal place or relic, without consent or a permit. A search of the Aboriginal Heritage Information Systems (AHIMS) on 15 September 2022 was undertaken over a 10 x 10 km search area. The search returned seven (7) previously recorded Aboriginal sites within the search area; however, none are within the study area, and are not deemed at risk of being impacted during construction or operation of the Proposal.

The proposed works will not impact upon any known Aboriginal sites provided the Environmental Safeguards outlined in Section 4.6.4 of this REF and which form part of this Proposal are followed.

Section 4.6 of this REF further addresses potential impacts and assessment undertaken on Aboriginal Heritage associated with the proposed works. Given the proximity to the Lachlan River, and presence of known Aboriginal artefacts in the area, a comprehensive Aboriginal Heritage Due Diligence assessment was completed by OzArk in February 2023 within the proposal study area to ensure any objects or places of Aboriginal heritage significance are identified as part of the construction phase, if present.

3.2.8 Heritage Act 1997 (Heritage Act)

The Heritage Act 1977 (Heritage Act) seeks to identify and protect items of cultural heritage value. The Heritage Council of NSW makes decisions about the care and protection of heritage places and items that have been identified as being significant to the people of NSW.

Automatic protection is afforded to 'relics' under the Heritage Act, defined as 'any deposit or material evidence relating to the settlement of the area that comprised New South Wales, not being Aboriginal settlement, and which holds State or Local significance'. Formerly the Act protected any 'relic' that was more than 50 years old. Now the age determination has been dropped from the Act and relics are protected according to their heritage significance assessment rather than purely on their age.

Excavation of land on which it is known or where there is reasonable cause to suspect that 'relics' will be exposed, moved, destroyed, discovered or damaged is prohibited unless ordered under an excavation permit.

Local, and NSW State historic heritage registers were consulted as part of preparation of this REF document (Section 4.5); no sites or relics were recorded within the study area.

3.2.9 Fisheries Management Act 1994 (FM Act)

The Fisheries Management Act 1994 (FM Act) aims to conserve threatened species, populations and ecological communities of fish and marine vegetation native to NSW and to promote ecologically sustainable development, including the conservation of biological diversity. It also aims to reduce the threats faced by native fish and marine vegetation in NSW.

Section 220ZZ of the FM Act states that the determining authority must consider the effect of an activity on:

- Areas of Outstanding Biodiversity Value (AOBV) as defined by the BC Act; and

- Species, populations or ecological communities, or their habitats as listed under the FM Act, and whether there is likely to be a 'significant effect' on those species, populations or ecological communities.

If a planned development or activity is likely to have an impact on an aquatic threatened species, population or ecological community this must be taken into account in the development approval process. If the impact is likely to be significant, as determined through an Assessment of Significance test, an SIS must be prepared. The implications of the FM Act have been considered for fish and aquatic species present within all creeks with the potential to be impacted by the Proposal.

If proposed works are within or adjacent to a waterway that fits the definition of Key Fish Habitat and / or is mapped as Key Fish Habitat, a permit for dredging, reclamation, and / or obstruction of fish passage is required under the FM Act. A permit for dredging work is required under s200 of Part 7 of the FM Act for any work that involves:

- Activities involving dredging and reclamation work (Part 7 permit);
- Activities temporarily or permanently obstructing fish passage (Part 7 permit);
- Using explosives, electrical devices or other dangerous substances in a waterway (Part 2 permit);
- Harming marine vegetation

Permits are required for works within a third order (or higher) streams (based on the Strahler system of stream order classification), and first and second order streams that are known or likely to be habitat for listed threatened species, populations or communities.

A Part 7 permit is required for works unless any planned dredging or reclamation work is:

- Carried out by Council and is carried out in accordance with the Code of Practice for Minor Works in NSW Waterways published on the Department's website: cl 263A Fisheries Management (General) Regulation 2010; or
- Authorised under the Crown Lands Act 1989 (s 200(2)(a)); or
- Authorised by a relevant public authority (other than Council) (s 200(2)(b)).

Execution of the Proposal will need to be completed in accordance with any conditions dictated in the Part 7 permit, if required and issued to Council by NSW Department of Primary Industries (DPI).

The process for seeking a Part 2 and Part 7 permit is separate to the preparation of the REF; however, the draft REF is supplied to Department of Primary Industries - Fisheries for assessment along with the permit application form, to provide adequate information to support the granting of the permit, including adequate descriptions of mitigation measures to be implemented, and an evaluation of risk of environmental impacts. In granting the permit, Fisheries will be a determining authority and so will also need to comply with Division 5.1 of the EP&A Act the *Environmental Planning and Assessment Regulation 2021.*

The subject site is adjacent to the Lachlan River, marked as Key Fish Habitat. The Lachlan River is calculated to be minimum 3rd order at the point where it is close to the proposed bore (Figure 7). As no trenching work is required within the bed or banks of any waterway, and no 'dredging and

reclamation' and / or 'obstruction of fish passage' is included in the Proposal's scope of works, a Part 7 s200 permit (Fisheries Permit) under the FM Act is not required.

The Proposal does not intersect or otherwise interact with any waterways mapped as supporting Key Fish Habitat (refer Section 4.2).

3.2.10 Water Management Act 2000

The *Water Management Act 2000* (WM Act), administered by the Water division of NSW Department of Planning and Environment, aims to ensure that water resources are conserved and properly managed for sustainable use benefiting both present and future generations. It provides formal means for the protection and enhancement of the environmental qualities of waterways and their in-stream uses as well as to provide for protection of catchment conditions. Council has applied for permission to undertake 'replacement groundwater works', to allow the works to be completed for the purposes of municipal water supply.

The Lachlan River occurs to the west of the study area, however no mapped waterways occur within the study area itself. Moreover, Council is exempt from s 91E(1) of the WM Act in relation to all controlled activities that it carries out in, on or under waterfront land (cl 41 *Water Management (General) Regulation 2018*).

3.2.11 NSW Biosecurity Act 2015 (Biosecurity Act)

The *NSW Biosecurity Act 2015* (Biosecurity Act) outlines mandatory measures that persons are to take with respect to biosecurity matters including the management of weeds (Part 2, Division 8 including Weeds of National Significance (WoNS)). Under the Biosecurity Act, the responsibilities for weed management by public and private landholders are consistent, reflecting that weed management is a shared community responsibility. The Act introduces the legally enforceable concept of a General Biosecurity Duty (GBD). Priority weeds are listed within Regional Strategic Weed Management Plans, however the GBD is not restricted to listed weeds.

The Biosecurity Act is administered by NSW Department of Primary Industries which determines the weed species covered by regulatory tools including Prohibited Matters, Control Orders and Biosecurity Zones. Existing Local Control Authorities (Councils) continue to be responsible for enforcing weed legislation.

No Priority weeds were observed on site as described in Section 4.7.

3.2.12 Local Land Services Act 2013 (LLS Act)

The *Local Land Services Act 2013* (LLS Act) regulates the clearing of native vegetation on all land in NSW mapped as Category 2 – Regulated Land as mapped on the Native Vegetation Regulatory Map. It does not include Excluded Land and Category 1 Exempt Land mapped on the Native Vegetation Regulatory Map.

Vegetation clearing which does not require development consent under the EP&A Act is considered for approval by the Native Vegetation Panel under the LLS Act.

A review of the Transitional Native Vegetation Regulatory map (report generated 19/07/22) confirmed that the study area occurs on land unmarked/unclassified, however, the study area is within close

proximity to land mapped as *'Steep or highly erodible land, protected riparian land or special land (category 2 – sensitive regulated land)'*. Consequently, the clearing regulations under Part 5A LLS Act do not apply.

3.3 Water Licences

3.3.1 Water Sharing Plan

There are five (5) Water Sharing Plans (WSP) that relate to the water sources found within the locality of the Proposal. These include:

- *Lachlan Unregulated and Alluvial Water Sources 2012*
- *Lachlan Alluvial Groundwater Sources 2020* (replaces the '*Lower Lachlan Groundwater Sources 2003'*, and the '*Lachlan Unregulated and Alluvial Water Sources 2012')*
- *Lachlan Regulated River Water Source 2016*
- *Lachlan Unregulated River Water Sources 2012*
- *NSW Murray-Darling Basin Fractured Rock Groundwater Sources 2020*

The water source for Bore 2 is the alluvial groundwater source, currently regulated by the *Lachlan Alluvial Ground Water Sources Order 2020 Water Sharing Plan* (WSP), made under the *Water Management Act 2000* (WM Act). The WSP sets the framework for managing groundwater in the water source. Under the WSP the long-term average annual extraction limit for the Upper Lachlan Alluvial Groundwater Source is 94,168 ML/year.

3.3.2 Water Access Licence

A water access licence (WAL) is typically required to extract water from rivers or groundwater sources. The WM Act administers the issue of WALs and approvals for water sources in NSW.

PSC, Forbes Shire Council (FSC) and Central Tablelands Water (CTW) each hold a local water utility access licence in Zone 3: Parkes at 4,350 ML/year (WAL 32032); FSC at 1,260ML/year (WAL 3200); and CTW at 400 ML/year (WAL 35600).

The corresponding works approval for the Parkes bores (Bores 1 to 5) is 70CA613604. This works approval is valid until 2028 and has a use purpose for town water supply, industrial, mining and recreation (groundwater). The corresponding works approval for the Forbes bores (three bores) is 70CA613724. The works approval for the Central Tablelands bores (two bores) is 70CA614488.

The WAL authorises the total volume for extraction, which is 4,350ML/year for Parkes. However, conditions on the works approvals limit the amount of water that can be taken out of each bore such that water cannot be taken where the rate exceeds 10L/second and the total amount for each bore cannot exceed 1,100ML/year.

Council will need to apply for a new or amended water use approval and water supply work approval to allow the works to be completed for the purposes of municipal water supply.

3.4 Community and agency consultation

3.4.1 Stakeholder consultation

Council has implemented a detailed consultation plan for the broader Parkes Water Security Program proposals, including but not limited to the concurrent refurbishment of the Parkes Borefield, the augmentation of the LRPS and development of the pre-treatment plant, and the Lachlan Pipeline Duplication project. Council will continue to consult with water utilities, businesses, farming enterprises, landowners and residents with potential to be impacted by the Proposal.

3.4.2 Private landowner consent

Landowner consent is required to lodge an application for development consent. However, it is noted in Section 1.4. of this REF that as the proposed works are appropriately characterised as development under the Transport and Infrastructure SEPP, the provisions of SEPP apply. Therefore, the Proposal can be undertaken as an activity under Division 5.1 of Part 5 of the EP&A Act, following assessment by Council in accordance with that Division, and landowner consent is not required under the *Environmental Planning and Assessment Act 1979*.

The proposal is to be undertaken on land that is identified Crown land, a licence under the CLM Act is required and will be obtained prior to commencement.

3.4.3 Mitigation of impacts during construction and operation

The assessment completed within this REF has concluded that socio-economic impacts are expected to be minimal and are not likely to significantly affect residents in proximity to the proposal, with the nearest residential dwelling located approximately 260 metres from the proposed study area. All construction works will occur within Crown owned land, with the closest road The Escort Way providing access for trucks and site traffic.

As noted in the Executive Summary, Section 2 ‘Proposal Description’, Section 0 ‘Certification’ and in the Environmental Safeguards developed for the Proposal (Appendix D), all work will be completed under the guidance of a CEMP to manage and minimise potential environmental impacts associated with the work. Additionally, once operational, the Proposal is not anticipated to result in any significant environmental or community impacts, as water extraction to be undertaken as part of operation of the new Bore will be within the current allowable limits for the Parkes Borefield Water Access Licence (WAL; refer Section 4.2 ‘Surface and groundwater’); as such, additional drawdown and consequent impacts on other users and the aquifer are not anticipated.

Given this conclusion, the likely impacts on surrounding residents, are minimal and anticipated to be limited to the construction period. The CEMP will list the responsibility of PSC, the Project Management Office (PMO) and the appointed Contractor(s) to develop and distribute notification to local residents before, during and after the construction period. The adequate notification period for residents is fourteen (14) days prior to works commencement.

Table 5 Proposed local resident notifications

Impact/mitigation	Stakeholder	Notifications
Noise, dust	Adjacent rural & residential landowners	Notifications to adjacent landowners; traffic management plans, noise monitoring protocols, working hours Person to person contact to notify rural landowners of any dust anticipated to settle in adjacent farm dams.
Traffic and access	Local traffic using The Escort Way	Advertisement in local papers (Forbes Advocate) advising of changed traffic conditions and delivery of construction loads.
Working hours	Local residents	Letterbox drop of notification listing working hours, and measures to manage local impacts; lighting, truck deliveries and noise onsite

Section 4 of this REF describes the site-specific environmental impacts and proposed environmental safeguards required to manage any impact during construction to be included in the CEMP.

3.4.4 Agency consultation and concurrent requirements

It is understood that Council's appointed Stakeholder Engagement Consultant, along with PSC staff and TEF is conducting all required consultation pertaining to the Proposal as part of the broader Program.

Liaison with the Department of Planning and Environment – Water (DPE Water) (formerly Natural Resource Access Regulator) has been established and is ongoing, to ensure all permits and licensing requirements are met to enable smooth delivery of the project.

As noted in Section 3.2.10 of this REF, Council will need to seek authority from the Water division of NSW DPE Water for the proposed works; a new or amended water use approval and water supply works approval is required to allow the works to be completed by Council for the purposes of municipal water supply. The ongoing liaison noted above is seeking confirmation of this and all other requirements as may arise.

1.1.1 Requirement to publicly display REF

Determining authorities are required to keep the following documentation available for public access once a determination has been made:

- The final REF document including appendices.
- Any associated SIS or BDAR
- The decision statement
- Any REF document addenda

The EP&A Regulation (section 171(4)) requires publication of the REF for activity with:

- A capital investment value of more than $5 million or,
- An approval or permit for activity that requires approval under
    - FM Act sections 144, 200, 205 or 219, or

- *Heritage Act 1977* section 57, or
- *National Parks and Wildlife Act 1974* section 90 or
- *Protection of the Environment Operations Act 1997* sections 47-49 or 122, or
- if the determining authority considers it to being the public interest.

There are allowances for exceptional circumstances where publication is not required; this is at the Planning Secretary's discretion. If the REF is to be published, the determining authority must place all relevant information on the determining authority's website or the NSW Planning Portal prior to the commencement of works.

Certain parts of the REF document may be sensitive, such as sensitive cultural information requested to be redacted by Aboriginal parties or cyber security impacts and mitigation measures. In these instances, the REF document content can be redacted where required. The REF document (excluding sensitive information) needs to be available online.

Council will ensure this REF and appropriate supporting documentation is made available online via Council's website.

4 Environmental Assessment

This chapter describes the potential key environmental impacts associated with the Proposal during both construction and operation and the site-specific Environmental Safeguards which are to be implemented as part of the Proposal to ameliorate any potential impacts identified.

A summary of the Environmental Safeguards has been provided as Section Appendix E – Summary of Safeguards.

4.1 Soils and Erosion

4.1.1 Existing environment

The site is largely vegetated as it is situated within a Crown Reserve on the outskirts of Forbes, adjacent the Lachlan River. The existing Bore 2 site is accessed by an unsealed access track, and the Bore compound / area immediately surrounding the existing infrastructure is earthen. The Bore itself is on stilts, with gravel underneath.

Due to the frequent seasonal summer rains, vegetative cover including native and exotic groundcovers and weeds was generally good throughout the study area, with soils intact and stable. The substrate was observed to be mostly alluvial with no rocky outcrops noted.

Cleared patches of soil, and gravelled areas occur along the access track, and surrounding the existing bore on site. Large stands of native vegetation occur in the subject site and study area, particularly along the Lachlan River. These stands contain a mixture of native canopy and native and exotic groundcovers. No erosion was evident at time of survey.

Due to recent heavy rains, remnants of standing water were noted in some paddocks within the broader properties during the July 2022 site visit.

Mitchell Landscape Soils

The study area is classified as 'Lachlan-Bland Channels and Floodplains' Mitchell Landscape for the entirety of the study area (Figure 3).

The Lachlan-Bland Channels landscape is described as having a general elevation of 200 – 280 m with a local relief of <10 m. The land is extensively cleared and cropped with grey cracking clays with gilgai along channels and in swamps, and low levees of red-brown sand or loamy sand on stream banks, extensive red-brown structured texture-contrast soils on the plains.

These soils can both be associated with waterlogging, low fertility and hard-setting surfaces.

Acid sulphate soils

Acid sulphate soils (ASS) are generally only considered a problem along the coastal areas of NSW where ASL <10 m and around wetlands of inland NSW. Inland acid sulphate soils have also been associated with discharging saline groundwater, however their occurrence is limited.

Figure 4 shows the ASS potential within the study area (SEED, 2021). The site is mapped as Bn(p4) ASS in inland lakes, waterways, wetlands and riparian lands. Specialist soil testing may need to be carried

out in order to determine the types and quantities of these soil types present and their likely effect on the proposed works.

4.1.2 Potential Soils and Erosion Impacts – Construction

Disturbance of the ground resulting from the access road upgrade, drilling operations, and trenching to accommodate the pipeline and electrical conduit increases the risk of erosion and subsequent sediment migration across the landscape. Soils will be excavated to a depth of 200mm along the access track and removed from site using truck and dog setups or similar. Road base will be imported into the site to ensure all-weather access to the road into the future.

The duration and intensity of rainfall during and after the proposed works will greatly influence the potential impacts to soils and contingency planning and preparation will be required to ensure these risks are minimised.

High winds have the potential to create dust/sedimentation/deposition issues during the proposed construction phase. There is potential for erosion if proposed work sites are left exposed for long periods of time without adequate safeguard measures to prevent runoff/wind erosion.

Use of fuels and chemicals, construction materials and wastes may also pollute soils on site.

4.1.3 Potential Soils and Erosion Impacts – Operation

The proposed 50m^2 drill pad, 685m length access road upgrade, and additional 25 m buffer to be temporarily impacted during the construction phase will increase the hardstand area immediately the existing bore site. It is anticipated that once operational, routine maintenance of the Bore would occur, which is not anticipated to result in additional environmental impacts beyond current site conditions. Routine maintenance is anticipated to be limited to infrequent site inspections using light personnel vehicles.

Providing Environmental Safeguards are closely adhered to, and the site is fully stabilised once work is complete, it is unlikely the Proposal will result in long term impacts to soils and erosion.

Table 6 Soils and Erosion impacts summary

Description	Y	N	Comments
Are there any known occurrences of salinity or acid sulfate soils in the area?	X		Yes, see Figure 4.
Does the Proposal involve the disturbance of large areas (e.g. >2 ha) for earthworks?		X	The direct impact area for the proposal is **0.53 ha.**
Does the site have constraints for erosion and sedimentation controls such as steep gradients, narrow corridors or is located on private property?		X	

4.1.4 Environmental Safeguards – Soils and Erosion

The Environmental Safeguards for Soils and Erosion are considered part of the Proposal and must be implemented. Safeguards to be implemented and maintained for Soils and Erosion include:

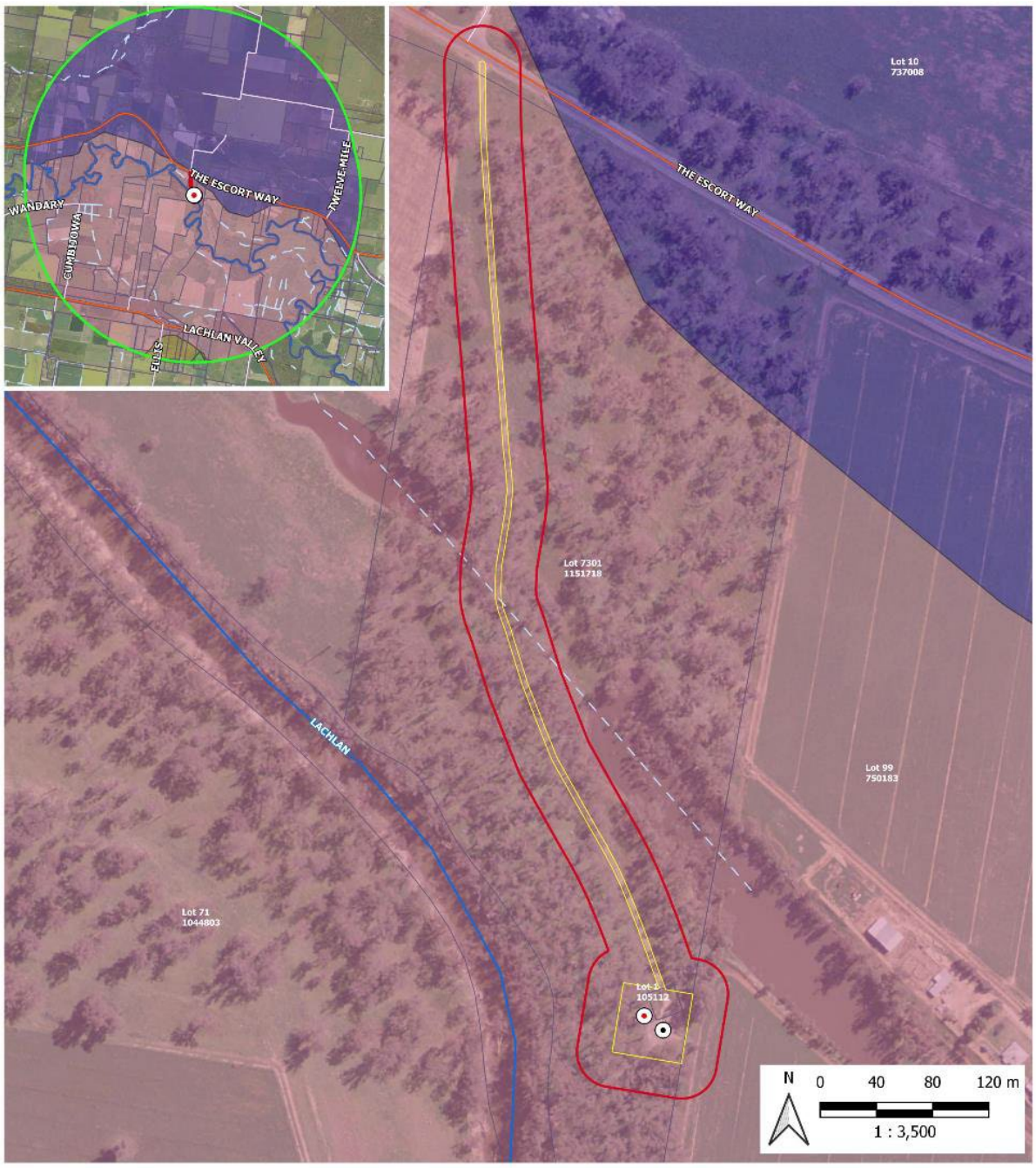
Construction

- No vegetation outside the approved direct impact footprint is to be impacted or removed; vegetation that is not approved for clearance is to be protected to ensure soils are not exposed unnecessarily.
- All areas where groundcovers/vegetation are required to be removed will require careful management during construction due to the higher erosion risks, including:
    - erosion and sediment (ERSED) control measures are to be implemented and maintained to:
        - prevent sediment moving off-site and sediment laden water entering any drainage lines, drain inlets, or dams; and
        - reduce water velocity and capture sediment on site.
    - ERSED controls are to be installed prior to the commencement of works and checked and maintained on a regular basis (including clearing of sediment from behind barriers).
    - ERSED control measures are not to be removed until the works are complete, and areas are stabilised.
- Monitoring and response actions with regards to ERSED controls will be incorporated within the Construction Environmental Management Plan (CEMP) for the Project, to be enforced by the appointed Contractor.
- The drill pad and any other excavated areas are to be stabilised as soon as possible using the most appropriate combination of the following measures:
    - Hydromulching with appropriate native grass mixture and/or groundcover species;
    - Turfing with appropriate native grass mixture and/or groundcover species;
    - Seeding with appropriate native grass mixture and/or groundcover species; and/or
    - Revegetation using appropriate native tubestock or mature seedlings.
- Sediment fences/strawbale filters or equivalent should be installed wherever water is predicted to enter/exit the works area.
- The maintenance of established stockpile sites during construction is to be in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book) (Landcom 2004).
- Stockpiles are recommended to be formed in accordance with the Blue Book Standard Drawing 4-1, and offsite/away from waterbodies where possible.
- Topsoil and subsoil are to be separated and protected from degradation, erosion or mixing with fill or waste. Materials are to be reused onsite where appropriate for infilling works, including re-spreading of topsoil as appropriate to enable rapid rehabilitation. Where onsite reuse cannot be accommodated, soil materials should be put to beneficial reuse elsewhere.
- If contaminated soils are encountered during construction, a site assessment is to be completed in accordance with Schedule A 'Recommended general process for assessment of site contamination' (NEPM 1999).
- If contaminated soils are encountered, they will be managed (and if necessary excavated, contained, treated and disposed of) in accordance with the law and relevant EPA and Council guidance.
- All chemical usage and storage during construction is to be in line with legislated requirements, to prevent Pollution of Land, which is prohibited under Section 142 A of the POEO Act.

Operation

- Monitoring of the site is to be undertaken to ensure ERSED controls remain in place until the site is re-stabilised, and to ensure no sediment is washed into any waterways following construction and before revegetation efforts are completed.
- Maintenance of vegetative cover on all exposed surfaces (not to be covered by road base/seal) to be undertaken to ensure the stability of soils on site into the future.
- Infill planting or additional spreading of appropriate native grass mixture and/or groundcover species to be undertaken until the entire site is stabilised.

Impacts associated with Soils and Erosion will not be significant if the above Safeguards are implemented and maintained.

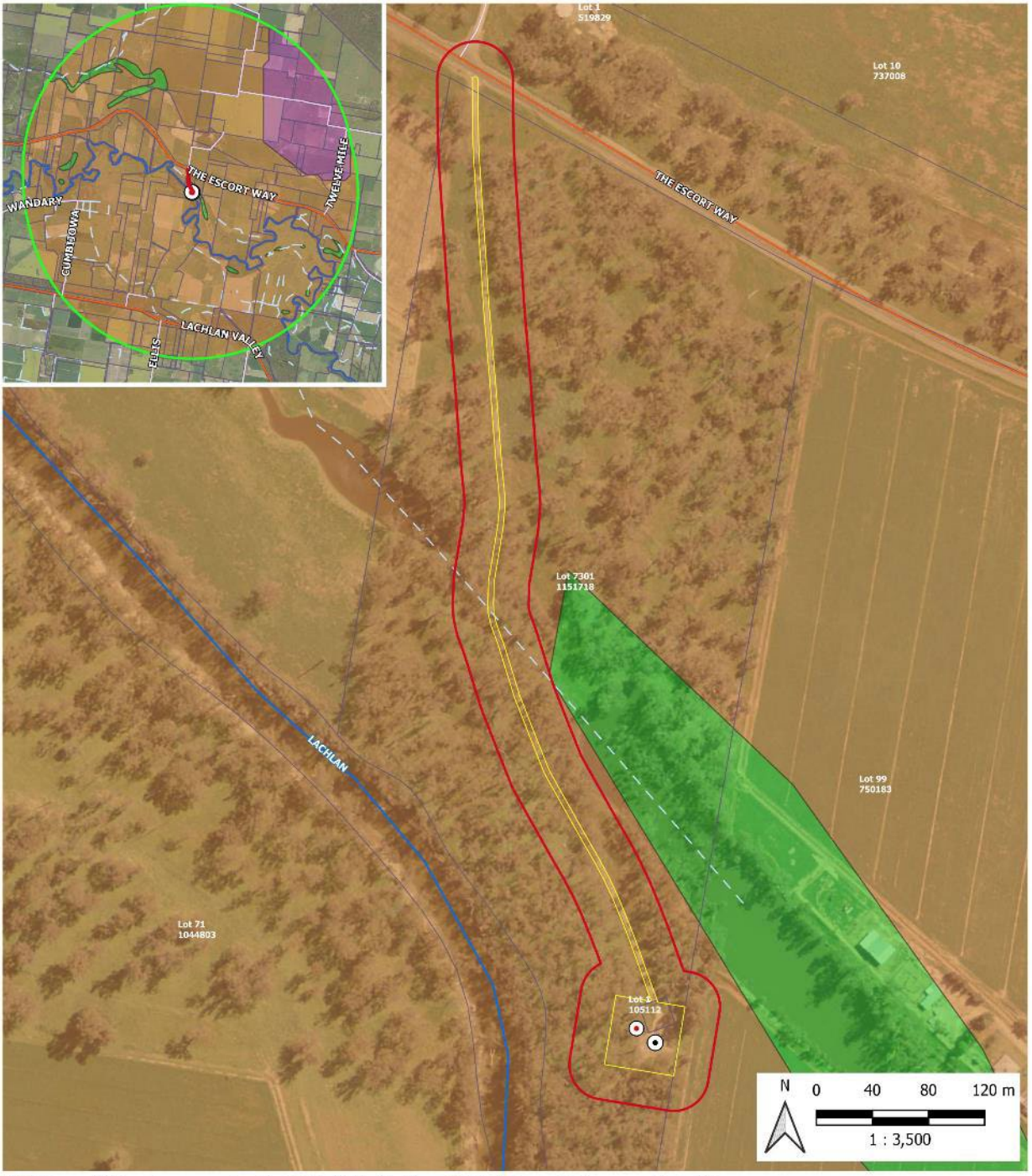


PSC Bore 2 Replacement - NSW (Mitchell) Landscapes within 5km of Proposal location

Legend

Proposed Bore 2
Existing Bore 2
Subject Site
Study Area
5km Radius
Roads
Arterial Road
Local Road
Primary Road
Sub Arterial Road
Waterways
Creek
River
1st & 2nd order; unnamed waterways
NSW (Mitchell) Landscapes
Bimbi Plains
Eugowra Plains
Lachlan - Bland Channels and Floodplains
Warraderry Range

Figure 3 NSW (Mitchell) Landscapes occurring within 5km of the study area.



PSC Bore 2 Replacement - Acid Sulfate Soils within 5km of Proposal location

Legend

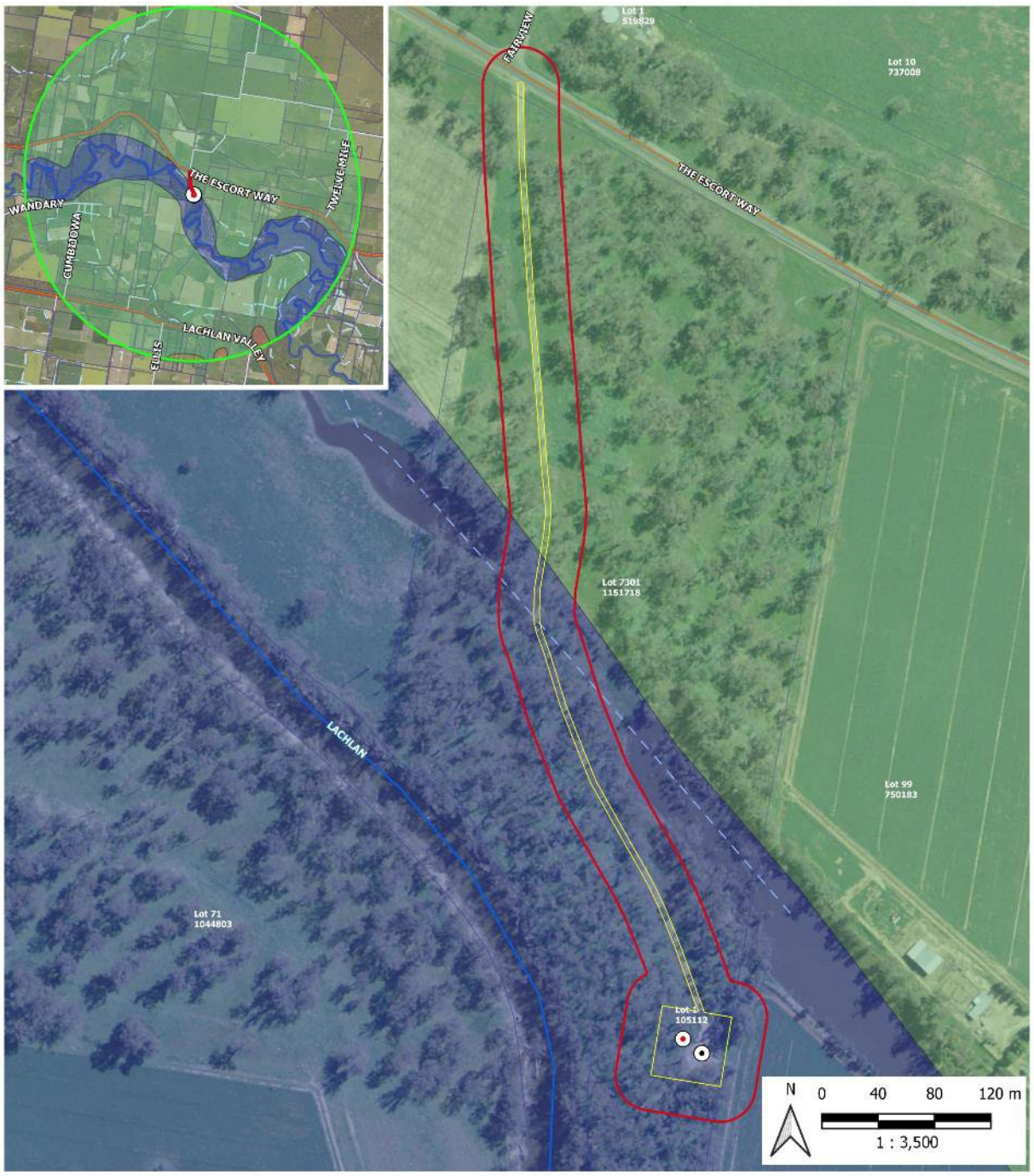
Proposed Bore 2
Exisiting Bore 2
Subject Site
Study Area
5km Radius

Roads
Primary Road
Arterial Road
Sub Arterial Road
Local Road

Waterways
Creek
River
1st & 2nd order; unnamed waterways

Acid Sulfate Soils
An(p4)
Bn(p4)
Cq(p4)

Figure 4 Acid Sulfate Soils potential mapped as occurring within 5 km of the study area.



PSC Bore 2 Replacement - Australian Soil Classification within 5km of Proposal location

Legend

Proposed Bore 2
Existing Bore 2
Subject Site
Study Area
5km Radius

Roads
Arterial Road
Local Road
Primary Road
Sub Arterial Road

Waterways
Creek
River
1st & 2nd order; unnamed waterways

Australian Soil Classification
Chromosols
Kurosols
Rudosols
Tenosols (Alluvial)

Figure 5 Australian Soil Classifications within 5 km radius of study area

4.2 Surface and Groundwater

4.2.1 Existing Environment

The Lachlan River is mapped as occurring approximately 45 m to the west of the study area at the nearest point. The site is largely flat and wetlands occur immediately to the west of the site. A small portion of the southwest corner of the study area is mapped as wetlands. The study area is recorded as containing shallow ground water resources that could be sensitive to trenching and easily contaminated (Figure 7). A small first order creek, a tributary to the Lachlan River crosses the access road that leads to the Bore 2 location. This currently flows over the access road, as a ford level crossing.

The Upper Lachlan Alluvial aquifer supplies Bore 2 and the surrounding borefield, and is divided into eight (8) management zones, of which Upper Lachlan Alluvial Zone 3 relates to this Proposal. Council currently has five (5) bores within this management zone (including the existing Bore 2) that extract approximately 2,000 to 3,000 ML/year. This water is pumped to Parkes via two pipelines - first to the Eugowra Road Pump Station (ERPS), onto Back Yamma Pump Station, and then to the Parkes Water Treatment Plant (WTP).

During recent drought, the townships of Parkes and Forbes have relied on groundwater for water supply, increasing groundwater extraction by up to 6,000 ML/yr. Much of this water is extracted from a single borefield area (11 major bores; five for town supply and six for irrigation), placing significant risk on those bores becoming overdrawn. With intermittent significant surface water recharge to the aquifers since 2012, the security and reliability of the current Parkes/Forbes borefield is of notable concern for those towns reliant on groundwater only.

The Upper Lachlan Alluvial Groundwater Source is currently regulated under *the Water Sharing Plan for the Lachlan Alluvial Groundwater Sources Order 2000* (WSP) made under the *Water Management Act 2000* (WM Act). The WSP sets the framework for managing groundwater in the water source. Under the WSP the long-term average annual extraction limit for the Upper Lachlan Alluvial Groundwater Source is 94,168 ML/year.

PSC, Forbes Shire Council (FSC) and Central Tablelands Water (CTW) each hold a local water utility access licence in Zone 3: Parkes at 4,350 ML/year (WAL 32032); FSC at 1,260ML/year (WAL 3200); and CTW at 400 ML/year (WAL 35600).

The corresponding works approval for the Parkes bores (Bores 1 to 5) is 70CA613604. This works approval is valid until 2028 and has a use purpose for town water supply, industrial, mining and recreation (groundwater). The corresponding works approval for the Forbes bores (three bores) is 70CA613724. The works approval for the Central Tablelands bores (two bores) is 70CA614488.

The WAL authorises the total volume for extraction, which is 4,350ML/year for Parkes. However, conditions on the works approvals limit the amount of water that can be taken out of each bore such that water cannot be taken where the rate exceeds 10L/second and the total amount for each bore cannot exceed 1,100ML/year.

The Proposal is located within the Lachlan River catchment (refer Figure 6), adjacent to the Lachlan River, which is identified as a major regulated river. The creek crossing the access road (refer Plate 1) is a first order unnamed waterway. There are a number of relevant water quality objectives that

require consideration, including but not limited to: aquatic ecosystems; visual amenity; livestock water supply; homestead water supply; irrigation water supply; and drinking water at point of supply – groundwater.

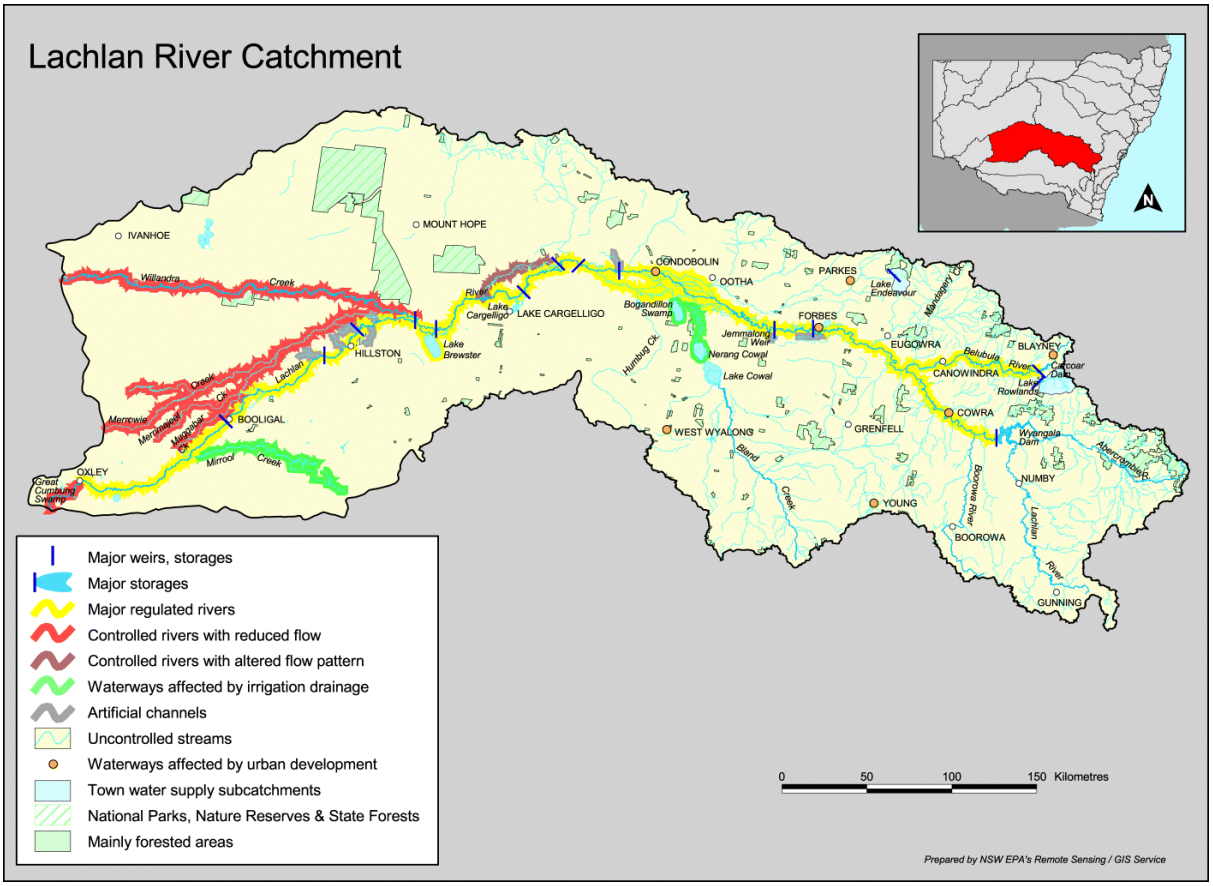


Figure 6 Lachlan River Catchment

Plate 1 Existing crossing on access road

Plate 2 Wetland downstream of access track crossing

Plate 3 Wetland upstream of access track crossing

Plate 4 Lachlan River passes <100m to the west of the Bore 2 location

4.2.2 Potential Surface and Groundwater Impacts – Construction

There is risk of impact to waterways as a result of the proposed works, as major waterways and vulnerable groundwater are in the vicinity of the study area. The study area however is predominantly flat. The main potential impact to waterways would arise from the potential for spills of fuels and other contaminants during construction which could enter runoff exiting the site and end up in adjacent dams, wetlands and waterways, including the waterway which intersects the access road; Trenching of the pipe and electrical conduits would need to take into consideration the identified groundwater vulnerability of the site, and construction techniques must adhere to the Safeguards outlined in Section 4.2.4. The access road upgrade includes a surface level upgrade to the existing ford level / culvert crossing over this waterway through placement of larger diameter road base material (refer Section 2).

However, nearby surface waters and dams are anticipated to remain unaffected due to the relatively minor scale of earthworks provided that the Safeguards outlined in Section 4.2.4 are adhered to.

4.2.3 Potential Surface and Groundwater Impacts – Operation

This Proposal is intended to proceed along with others within the Program. Each proposal is independent and may or may not proceed on its own merits, however there may be operational activities that occur in parallel, which could result in additional surface and groundwater impacts. Given that PSC are responsible for all associated proposals, the operational impacts of this Proposal will be in line with PSC's water extraction license specifications.

If PSC water license specifications, ERSED measures and best practice design principles that form part of this Proposal are adhered to, impacts to surface and groundwater from the operation of the proposed Bore 2 replacement and access road upgrade are not anticipated to be significant.

Table 7 Waterways impacts summary (adapted from Div 1 (2.13) TISEPP 'Consultation Requirements')

Description	Y	N	Comments
Are the works located within or adjacent to a waterbody or wetland? Waters are defined under *Protection of the Environment Operations Act 1997* and water land and wetlands under section 198A of the *Fisheries Management Act 1994* and include rivers, streams, lakes, lagoons and constructed waterways, and dams.	X		The Lachlan River is approximately 45 m from the study area at its closest point, and immediately adjacent to an identified wetland. One mapped waterway occurs within study area.
Is a Fisheries Permit required? Part 7 Fisheries Permits are automatically required for any third order (or higher) stream under the *Fisheries Management Act 1994* (FM Act).		X	No 3rd order streams or higher occur within the study area.
Will the proposed works be undertaken on a bridge?		X	
Are the works likely to require the extraction of water from a local water source (not mains)?		X	Upper Lachlan Alluvial Groundwater Source will be tapped in to under existing water extraction licenses. A water cart may be required to dampen

Description	Y	N	Comments
			soils during construction activities; water may be drawn from the local farm water supply.
Is the site identified as High or Moderate Groundwater Vulnerability?	X		Refer Figure 6
Are the proposed works likely to have an effect on the surrounding water quality? This can include sediment migration, dust, and potential risks of fuel or chemical spills, to both surface and ground waters.		X	Potential for dust deposition in farm dams and sediment migration off-site is low. Provided that the Safeguards outlined in Section 4.2.4 are adhered to potential risk of fuel or chemical spill is low.
Does the proposal involve connection to, and use of a substantial volume of water from, any part of a water supply system owned by a Council	X		Works are being conducted by Council, under an existing Water Access Licence
Does the Proposal involve the connection to, and a substantial impact on the capacity of, any part of a sewerage system owned by Council		X	
Is the Proposal likely to have a substantial impact on stormwater management services provided by Council		X	No, the site does not interact with the stormwater
Are the works being carried out on flood liable land? (Written notification to the State Emergency Service may be required if the activity is a relevant provision under Division 1 (2.13) of the Transport and Infrastructure SEPP)	X		Council's appointed contractor/s will notify the SES prior to commencement of works within the floodplain
Is the Proposal being carried out on land that is within a coastal vulnerability area and is inconsistent with a certified coastal management program?		X	

4.2.4 Environmental Safeguards – Surface and groundwater

The Environmental Safeguards for Surface and Groundwater are considered part of the Proposal and must be implemented. Safeguards to be implemented and maintained for Waterways include:

Construction

- If 'dirty' site water is collected from within the direct impact footprint, it is to be redirected to filtration devices to trap sediments and other pollutants, and dissipate flow velocities, prior to discharging to the surrounding environment. Drainage and runoff should be controlled in such a way that no foreign substrates or materials leave the site.
- 'Clean' water from outside the study area is to be diverted around the site, to avoid contamination and to prevent scour/erosion of the site during rainfall events during construction.
- Works to be completed in dry times (i.e. times of no current or predicted rainfall).
- Appropriate sediment and erosion controls are to be installed and maintained during construction, to ensure sediment and pollutant laden surface water runoff does not enter adjacent waterways/drainage lines.

- Any water intersected or used during the drilling procedure is intersected is to be captured in an appropriately lined sump and disposed of appropriately off site.
- All litter, including cigarette butts and food wrappers, is to be collected in a suitable receptacle and disposed of appropriately throughout the construction phase to ensure these do not end up polluting waters.
- Re-fuelling of plant and equipment is to occur offsite, or in impervious bunded areas located a minimum of 40 metres from drains, drainage lines or dams.
- Vehicle wash-down and/or cement truck washout (if required) is to occur offsite unless it forms part of sediment control, where it is to occur in a suitably bunded area with controlled run-off.
- Monitoring of water quality is to be undertaken within culverts during and immediately following rainfall events, to identify if ERSED controls are functioning as intended. Visual inspections should be undertaken by an appropriately qualified person/s to determine if water is turbid, or if there is evidence of petrochemicals or other pollutants present as a consequence of construction activities.
- Segregate and stockpile topsoil removed from the area a minimum of 40 m from any waterway and on a flat, stable area. Use measures such as silt fences and holding ponds to prevent stockpile runoff from entering waterways.
- Minimize the length of time that soils are exposed by stabilising as soon as practical by seeding, spreading mulch or installing erosion control blanket as appropriate.
- Biosecurity and water health protection measures should be implemented throughout the construction phase, including:
    - Machinery should arrive on site in a clean, washed condition, free of fluid leaks, pests and/or weeds/spores;
    - Regular weed control should be undertaken in disturbed areas throughout the construction period to prevent weed spread into waterways, if notifiable/listed weed material is present (unlikely); and
    - Ensure all pesticide/herbicides used are registered for use within a waterway, as per NSW DPI guidelines. Alternatively, opt to remove weeds mechanically where possible.
- Spill response protocols for plant, equipment and chemicals used or stored on site during construction are to be available and accessible at all times to prevent and minimise potential for Pollution of Waters (s120 POEO Act).
- A Soil and Water Management Plan will be developed as part of the CEMP for the Proposal, detailing:
    - Water quality parameters
    - Appropriate monitoring locations and frequency
    - Location and types of ERSED controls
    - Proposed revegetation and stabilisation measures to be undertaken

Operation

- Ensure the amount of water extracted annually from the bore does not exceed the rate of 10L/second and the total amount for the bore does not exceed 1,100ML/year.

- Continue to undertake a water quality and quantity monitoring program in line with Council's requirements until all sites are completely stabilised; monitoring should include details of proposed baseline and downstream/dam water quality following any heavy rainfall.
- Subject site rehabilitation, including removal of weeds and revegetation using appropriate native species, to be undertaken to ensure soil stability and prevention of sediment runoff from the site into the future. Revegetation must be maintained with a survival rate of >80%.
- Monitor access roads following heavy rains and ensure engineering safeguards to prevent erosion and movement of surface sediment are functioning correctly.

Impacts associated with Waterways will not be significant if the above Safeguards are implemented and maintained.

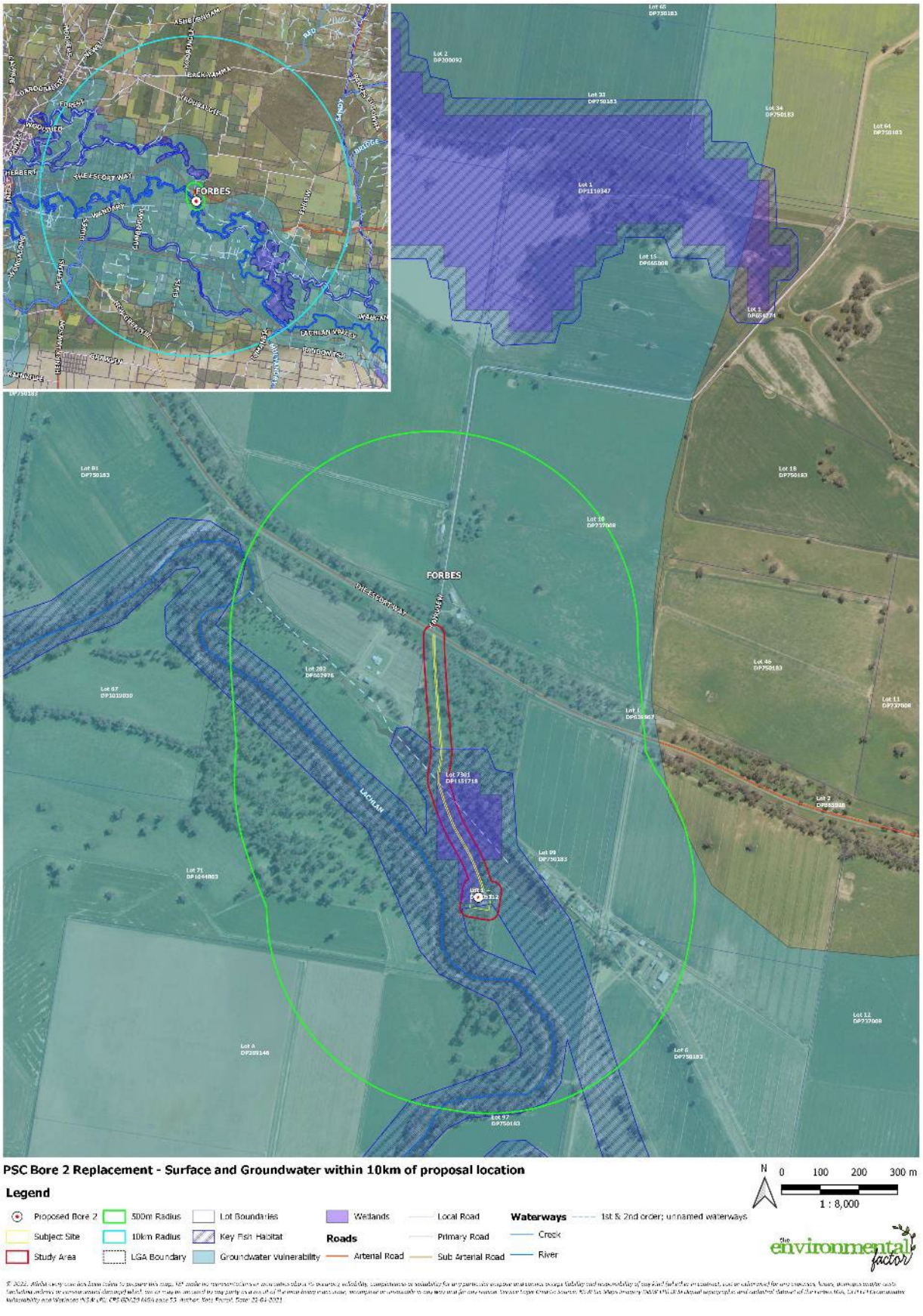


Figure 7 Waterways, surface and groundwater vulnerability within 500 m of the Subject Site

4.3 Noise and Vibration

4.3.1 Existing environment

The study area occurs in a rural area, with background noise levels typically arising from farming machinery and activities, local traffic, anthropogenic noises, livestock, wildlife and inclement meteorological conditions (rain and wind).

The closest private residence is located approximately 200 m to the east of the study area, accessed via a gravel road from The Escort Way. The 'Springfield' homestead is identified approximately 450 m to the south east of the study area, and the 'Innisfail' homestead is identified approximately 1 km to the south of the study area, accessed via a gravel road from The Escort Way and the Lachlan Valley Way respectively. There are no further properties or private property access roads located within 1 km of the proposal. The study area and vicinity fall entirely within RU1 – Primary Production land zoning (refer Figure 2 and Figure 8) and therefore the land within 1 km of the proposal is dedicated to cropping and stock and is therefore vacant.

Cars and trucks travelling between 50-100km/hr along The Escort Way were observed to cause the main noise disturbance on site as noted during the July 2022 site visit; however, noise observations made were anecdotal only, as no noise recording devices were used. Farm machinery used for cropping activity on the property are also likely to produce seasonal noise disturbance across the site.

4.3.2 Potential Noise and Vibration Impacts – Construction

This Proposal is intended to proceed along with others within the Program. Each proposal is independent and may or may not proceed on its own merits, however there may be construction activities that occur in parallel, which could result in cumulative noise and vibration impacts. Given that PSC are responsible for all associated proposals, the construction impacts of this Proposal will be scheduled to minimise any cumulative effects of the separate proposals in the Program proceeding at the same time.

Noise impacts during construction are anticipated to arise from increased heavy vehicle and plant movements; excavators, drill rig and other mechanical equipment including general engine noise and reverse alert beepers are expected as part of the construction phase. The private properties located within 1 km of the study area and may experience some minor noise disturbances during construction activities. However, due to the rural location of the site and lack of further nearby private residences, these noise impacts are unlikely to cause much disruption or constitute intrusive noise.

4.3.3 Potential Noise and Vibration Impacts – Operation

The Proposal is not anticipated to generate any noise or vibration during the operational phase.

Table 8 Noise and Vibration impacts summary

Description	Y	N	Comments
Are there any noise sensitive areas near the location of the proposed works? i.e. < 500m at nearest point, that may be affected by the works e.g. church, school, hospital, residences	X		There are two private residences identified within 500m of the proposal.

Description	Y	N	Comments
Are the proposed works going to be undertaken during standard working hours detailed below? **Monday – Friday:** 7:30am to 6:00pm **Saturday:** 8:00am to 1:00pm **Sunday and Public Holidays:** No work	X		Proposed construction hours are as follows: • **Normal construction** Monday to Friday: 7 am – 6pm Saturday: 8 am – 1 pm Sundays and Public Holidays: No Works
Is any explosive blasting required for the proposed works?		X	No need for blasting or rock breaking has been identified prior to the preparation of this REF.
Is there potential for ongoing operational noise to be generated post completion of works?		X	The proposed water bore will not generate any operational noise.

4.3.4 Environmental Safeguards – Noise and Vibration

The following Safeguards for Noise and Vibration are part of the Proposal and must be implemented and maintained. Safeguards to be implemented and maintained for Noise and Vibration include:

Construction

- Noise emissions should be considered in terms of the Interim Construction Noise Guideline (ICNG) (Department of Energy and Climate Change (DECC) 2009).
- Noise impacts to the local community will be limited to recommended standard working hours as detailed in the Interim Construction Noise Guideline 2009 (ICNG). All activities and project works, including the arrival and departure of vehicles delivering or removing materials to or from the site, shall be carried out between the hours of:

  7:00am to 6:00pm Monday to Friday,
  8:00am to 1:00pm Saturdays, and
  No work Sunday and Public Holidays

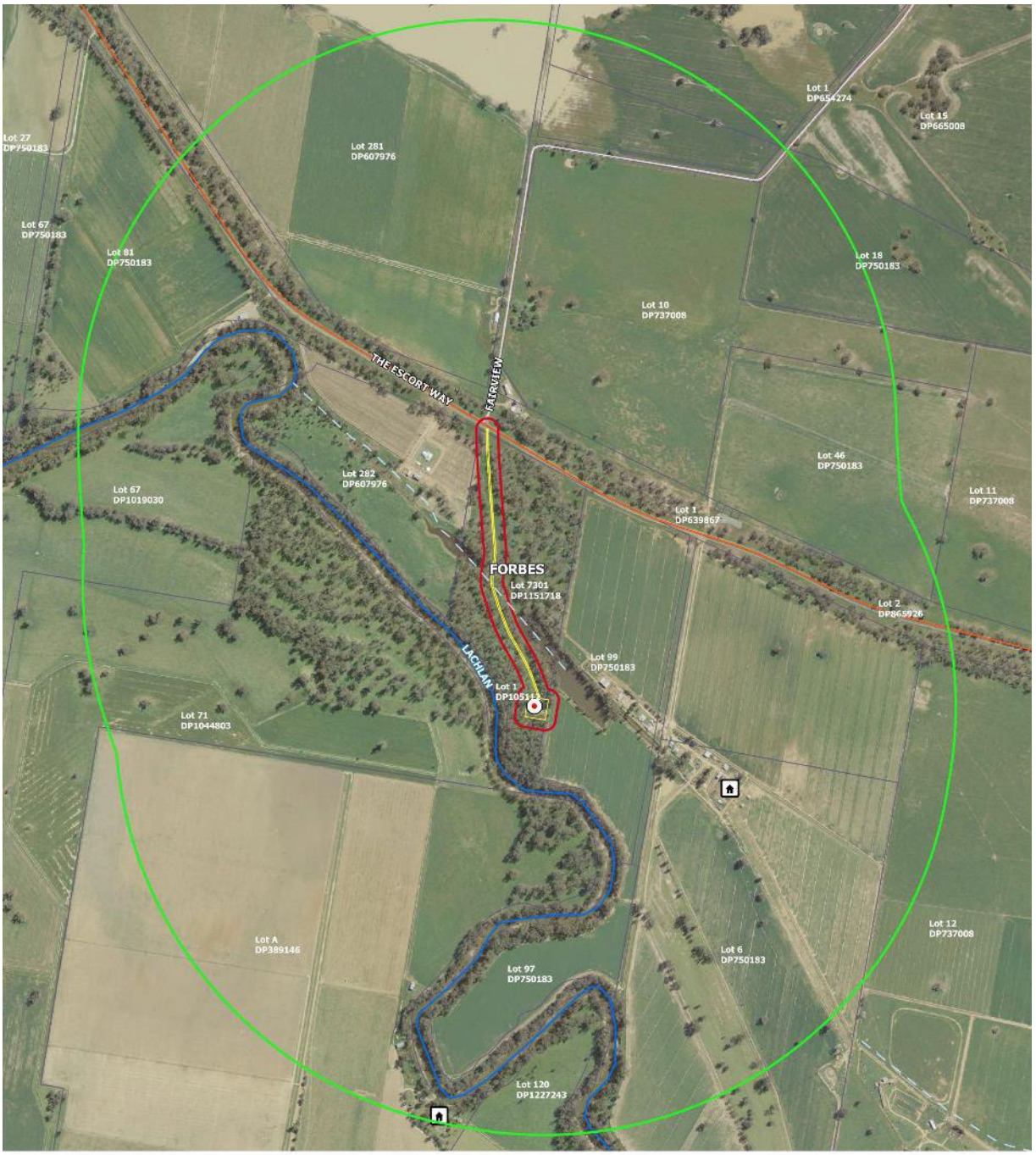
- Nearby residents that have the potential to be impacted as part of works should be notified of the proposed construction no less than two (2) weeks prior to works commencing.
- Communication of intentions and timeframes to neighbouring properties will minimise misconceptions, uncertainty and negative reactions to noise. The site supervisor should supply a contact number to aid in community liaison.
- All complaints are to be handled in a timely manner.
- The appointed contractor will incorporate Noise and Vibration Management strategies in the CEMP, and suitably induct all staff operating machinery on the site to ensure the standard working hours are adhered to, and that machinery movement (revving, reverse beepers) is kept to a minimum. This management plan must include the general noise and vibration management practices (AS 2436-2010).
- Plant deliveries and site access will occur quietly and efficiently, with parking allowed only within designated areas located away from nearby sensitive receivers.
- Simultaneous operation of high-level noise generating machinery should be avoided by operating at contrasting times or increasing the distance between the plant and the nearest identified receiver.
- High noise generating activities, such as jack hammering, should be carried out in continuous blocks, not exceeding 3 hours with a minimum respite period between blocks of one hour.

- Low-pitch tonal beepers should be installed where possible and reversing minimised on site.
- All engine covers are to be closed and machines that are not in use, shut down.
- Where possible, high noise generating activities such as loading and unloading and material dumps should be located as far as possible from the nearest receptors.
- Works should be timed to avoid prime breeding season (Spring) for the majority of native species residing in the area.

Operation

No further Safeguards were considered necessary for the operational phase of the Proposal. Operation of water bore following installation is not likely to result in any ongoing noise impacts.

Impacts associated with Noise and Vibration will not be significant if the above Safeguards are implemented and maintained.



PSC Bore 2 Replacement - Sensitive Receivers within a 1km radius

N 0 150 300 450 m

1 : 12,000

Legend

- Proposed Bore 2
- 1km Radius
- Study Area
- Subject Site
- Lot Boundaries
- Homestead

Waterways

- Creek
- River
- 1st & 2nd order; unnamed waterways

Roads

- Arterial Road
- Local Road
- Primary Road
- Sub Arterial Road

Figure 8 Sensitive receivers within a 1 km radius of the proposal

4.4 Air Quality

4.4.1 Existing environment

Long-term meteorological data for the surrounding area is available from the Bureau of Meteorology (BoM) operated Automatic Weather Station (AWS) at the Forbes Airport. The Forbes Airport AWS is located approximately 7 kilometres west of Forbes and records observations of a range of meteorological data including temperature, humidity and rainfall, wind speed and wind direction.

Temperature data recorded at the Forbes Airport AWS indicates that January is the hottest month of the year, with a mean daily maximum temperature of 34.5°C. July is the coolest month with a mean daily maximum temperature of 14.7°C. March is the wettest month with an average rainfall of 55.5 mm falling over almost 4.3 days. According to long-term records, there are on average 56 rain days per year, with a mean annual rainfall of approximately 493 mm. Forbes experiences a moisture deficit, with evaporation exceeding rainfall for all months, excluding June and July. The increased moisture deficit of the hotter months increases the dust erosion potentials of exposed areas and therefore has important implications for fugitive dust control during the construction phase.

Weather conditions in Forbes on the 21st of July 2022 were cool to mild with a minimum of 6.9 degrees and a maximum of 18.1 degrees. No Rain was recorded at the Forbes airport weather station, nor was rain observed during the site visit (Table 9).

Table 9 Weather conditions preceding and during field surveys (weather station: IDN60801 Forbes airport AWS)

Date	Temperature (°C)		Rain (mm)	Max Wind Gust	
	Minimum	Maximum		Speed km/hr	Direction
14/07/2021	1.3	12.9	0	22	SW
15/07/2021	-3.5	12.0	0.2	15	WSW
16/07/2021	-1.6	14.4	0	33	N
17/07/2021	2.6	17.9	0	46	SW
18/07/2021	3.1	12.0	0.2	28	WSW
19/07/2021	-0.6	13.8	0	37	ESE
20/07/2021	3.3	17.7	0	41	ESE
21/07/2022	6.9	18.8	0	31	ESE

Forbes and the surrounding area generally enjoy clean air; a lack of heavy industry and a low concentration of vehicles ensures that pollutant levels are relatively low. The primary air pollution emissions sources that contribute to existing ambient air quality levels in the Forbes area include:

- wind generated dust from exposed areas within the locality;
- dust emissions from agricultural activities;
- dust entrainment due to vehicle movements along unsealed and sealed town and rural roads with high silt loadings;
- diesel and petrol fuel combustion emissions from road and non-road sources;
- seasonal emissions from household wood burning; and
- episodic emissions from dust storms and vegetation fires (local and regional).

4.4.2 Potential Air Quality Impacts – Construction

This Proposal is intended to proceed along with others within the Program. Each proposal is independent and may or may not proceed on its own merits, however there may be construction activities that occur in parallel, which could result in cumulative air quality impacts. Given that PSC are responsible for all associated proposals, the construction impacts of this Proposal will be scheduled to minimise any cumulative effects of the separate proposals in the Program proceeding at the same time.

Potential impacts to air quality may arise from airborne dust particles generated during earthworks, stockpiling and managing topsoil, transport and handling of soils and equipment and the use of construction vehicles and the drill rig emitting exhaust fumes. The extent of air pollution generated during construction depends on a number of factors, including the type of machinery used, construction techniques, weather conditions and the cumulative effect of other construction activities in the near vicinity (e.g. agricultural activities such as ploughing).

The impacts are anticipated to be of short duration and minor in nature and are not expected to have a large or prolonged impact on air quality in the area.

4.4.3 Potential Air Quality Impacts – Operation

Following the stabilisation of disturbed ground, the Proposal is not anticipated to have an impact on air quality in the area during the operational phase.

Table 10 Air Quality impacts summary

Description	Y	N	Comments
Are the proposed works likely to result in large areas (>2ha) of exposed soils?		X	The total direct impact area is 0.53 ha. All areas of exposed soil will be rehabilitated after drilling and trenching through revegetation or laying of road base to secure soils.
Are there any dust sensitive receivers located within the vicinity of the proposed works (<500m away at nearest point) during the construction period (i.e. church, school, hospital, residences)?	X		Two private residences have been identified within 500 m of the proposed works.
Is there likely to be an emission to air of dust, smoke, steam or vehicle emissions?	X		Yes, though minimal; the study area and locality contain fine, friable soils likely to result in dust emissions once disturbed. Safeguards should effectively ameliorate any emissions if correctly adhered to.

4.4.4 Environmental Safeguards – Air Quality

The following Safeguards for Air Quality are part of the Proposal and must be implemented. Safeguards to be implemented and maintained for Air Quality are as follows:

Construction

- Council must undertake community engagement and liaison, to set expectations for the works schedule and likely impacts arising as part of the works, particularly prior to works commencing.
- Daily visual construction dust monitoring should occur, with works to cease if dust plumes are occurring that have potential to impact areas outside the direct impact footprint.
- Speed limits on access tracks and across the site during dry weather to keep dust to a minimum.
- Provide an adequate water supply on the construction site for effective dust/particulate matter suppression/mitigation. If synthetic dust suppressants are used, they must be biodegradable in nature and non-toxic for waterways.
- Earthworks and exposed areas/soil stockpiles are to be revegetated using appropriate native/crop species to stabilise surfaces as soon as practicable.
- Only vegetation that has been approved for removal may be removed or otherwise impacted; intact vegetation stabilises soils and keeps dust to a minimum.
- Vegetation and other materials are not to be burnt on site, unless the vegetation material is a weed that prohibits transportation and disposal by other means.
- Vehicles transporting waste or other materials that may produce odours or dust are to be covered during transit.
- Tracking of machinery carrying soil/spoil through Forbes or Parkes township is to be avoided where possible.
- Stockpiles or areas that may generate dust are to be managed to suppress dust emissions.
- Dampening of exposed soils will be undertaken during weather conditions conducive to visible dust formation.
- Construction plant and equipment will be maintained in a good working condition in order to limit impacts on air quality through vehicle emissions.
- Fuel operated plant and equipment will not be left idle when not in use.
- Regular site inspections will be undertaken as part of air quality monitoring, and inspection results recorded by Council's Principal Contractor.
- Any dust complaints received during construction will be duly investigated in accordance with Council's requirements under the POEO Act.
- Any exceptional incidents that cause dust and/or air emissions, either on or off site, will be recorded, and the action taken to resolve the situation recorded in the logbook.

Operation

- Speed limits on access track to bore pad during dry weather to keep dust generation to a minimum.

Impacts associated with Air Quality will not be significant if the above Safeguards are implemented and maintained.

4.5 Non- Aboriginal Heritage

4.5.1 Existing environment

Forbes has a rich cultural history, traditionally home to the Wiradjuri people, with a population boom related to the discovery of gold in the region in the early 1960's. The town has a number of important stock routes passing through, as well as a history of agriculture since the 1860's. The dominant land use throughout the Forbes region is agriculture including farming and grazing, which are fundamental to the local economy. Disturbance regimes associated with the land uses of the study area include vegetation clearing, cropping and grazing, access tracks, and residential dwellings.

Despite the Forbes region having a diverse and well recorded cultural history, a search of the Heritage Council of NSW administered heritage databases and the *Forbes Local Environmental Plan 2013* (LEP) returned no records of historical heritage sites within 1 km of the study area.

4.5.2 Potential Non-Aboriginal Heritage – Construction

Due to the small scale of the Proposal, located in previously disturbed cropped land and with existing access tracks, it is highly unlikely that any items of Non-Aboriginal Heritage would be discovered while upgrading the access road and clearing the groundcover within the subject site.

No impacts to surrounding heritage sites are anticipated to occur as there are no recorded sites surrounding the study area; however, there is always potential for the works to uncover unanticipated finds. The Safeguards outlined in section 4.5.4 provide additional protection and further decrease the risk of any such damage.

4.5.3 Potential Non-Aboriginal Heritage – Operation

No damage or interference to any items or places of Non-Aboriginal Heritage are expected during operation of Bore 2.

Table 11 Non-Aboriginal Heritage impacts summary

Description	Y	N	Comments
Are there any items of Non-Aboriginal heritage located within the vicinity (1km) of the proposed works?		X	No
If yes, list the item(s) and their heritage significance (i.e. s170 register, Council Register, State Heritage Register, National Heritage Register).	N/A		
Is the development on, or reasonably likely to have an impact on, a part of the Willandra Lakes Region World Heritage Property (if so, consultation is required with the World Heritage Advisory Committee and Heritage NSW),		X	No
Is the Proposal likely to affect the heritage significance of a local heritage item, or of a heritage conservation area, that is not also a State heritage item, in a way that is more than minor or inconsequential?		X	N/A
Is further assessment of the potential impact on a listed heritage item required? And has this assessment been provided along with written notification to the local Council for the area in which the heritage item is located?		X	N/A

4.5.4 Environmental Safeguards – Non-Aboriginal Heritage

The following Safeguards for Non-Aboriginal Heritage are part of the Proposal and must be implemented and maintained. Safeguards to be implemented and maintained for Non-Aboriginal Heritage are as follows:

- If archaeological remains or items defined as relics under the NSW *Heritage Act 1977* are uncovered during the works, all works must cease in the vicinity of the material/find and Council's Manager Strategic Planning and Environmental Officer are to be contacted immediately.
- Council's workers and all staff must be made aware of the heritage sites and place that occur within the area and all care must be taken to avoid interference with and damage to these sites.
- Heritage sites must be clearly fenced/flagged with removable flagging or other temporary means to delineate their presence and in order to prevent them being harmed during the construction process.

Impacts associated with Non-Aboriginal Heritage will not be significant if the above Safeguards are implemented and maintained.

4.6 Aboriginal Heritage

4.6.1 Existing Environment

A search of the AHIMS on 15 September 2022 was undertaken over a 10 x 10 km search area by OzArk. The search returned seven (7) previously recorded Aboriginal sites within the search area; however, none are within the study area, and are not deemed at risk of being impacted during construction or operation of the Proposal. The closest Aboriginal site is located approximately 650 m north west of the study area (refer Figure 9). Given the proximity to the Lachlan River, and the presence of known artefacts in the area, An Aboriginal Due Diligence (ADD) was completed by OzArk in February 2023.

The proposed study area includes land that has been disturbed in the past, through water and electrical infrastructure, ploughing, fencing, road construction, grading, and clearing (refer plate 5 and 6 below).

The undertaking of the due diligence process resulted in the conclusion that the proposed works will have an impact on the ground surface, however, no Aboriginal objects or intact archaeological deposits will be harmed by the proposal. This moves the proposal to the following outcome:

"Aboriginal Heritage Impact Permit application not necessary. Proceed with caution. If any Aboriginal objects are found, stop work, and notify Heritage NSW (02) 9873 8500 (heritagemailbox@environment.nsw.gov.au). If human remains are found, stop work, secure the site, and notify NSW Police and Heritage NSW."

Plate 5 Access road and electrical infrastructure within subject site

Plate 6 Existing Bore 2 Infrastructure

4.6.2 Potential Aboriginal Heritage Impacts – Construction

The level of disturbance (historic and recent) within the study area means that there is a low chance of intact sub-surface deposits being present within the area. There are however several known artefacts within the area, therefore the potential to discover previously unidentified artefacts is real, and the safeguards identified in Section 4.6.4 must be strictly adhered to.

4.6.3 Potential Aboriginal Heritage Impacts – Operation

No impacts to places, artefacts or Aboriginal Heritage sites are expected during use / operation of Bore 2.

Table 12 Aboriginal Heritage impacts summary

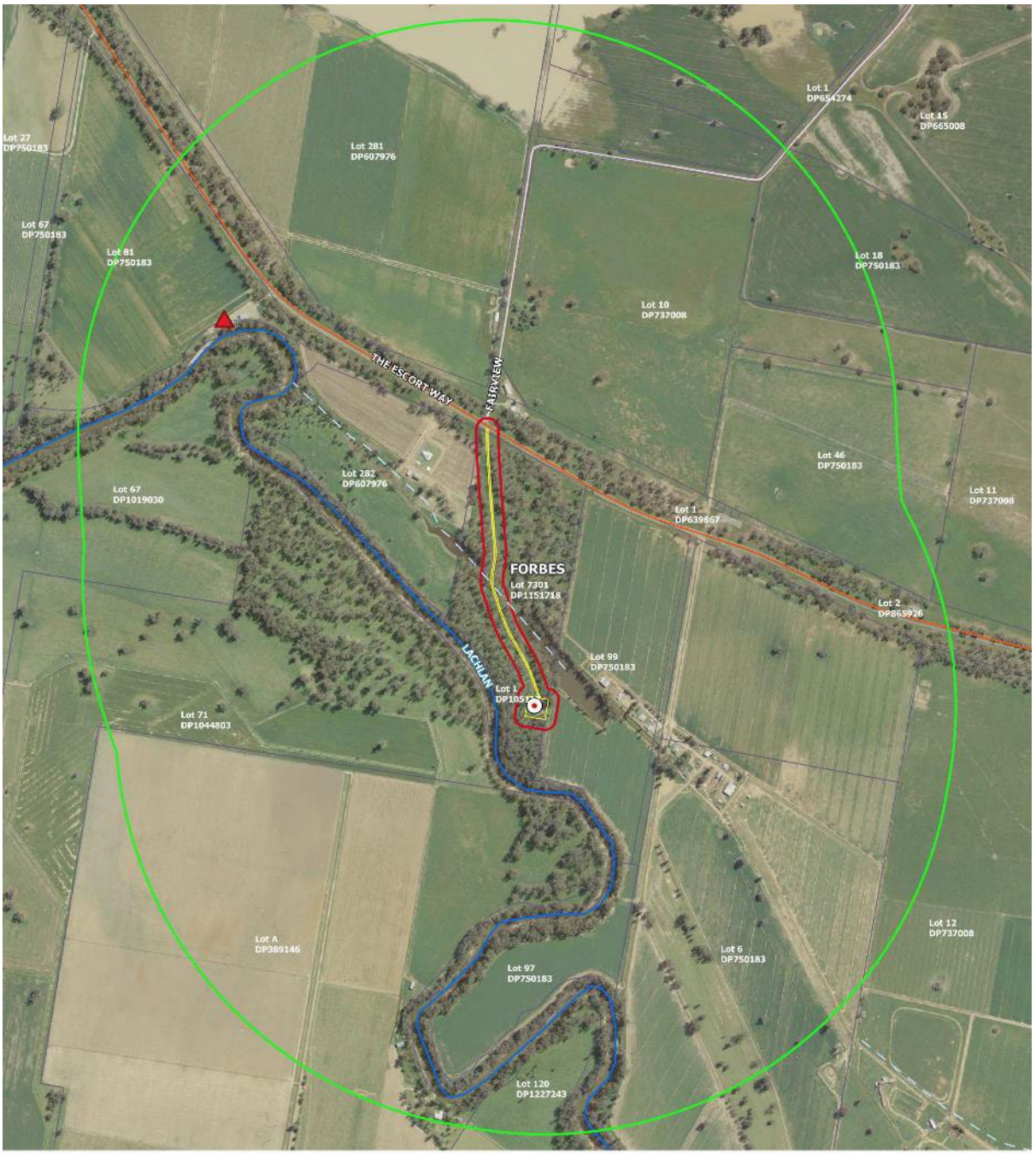
Description	Y	N	Comments
Are the works likely to disturb previously undisturbed areas of the landscape? Check for good camping sites (flat, near water, availability of bush foods), mountain ridges, spurs or vantage points or rocky outcrops that may have ceremonial significance, and the presence of stone tools, shells or other evidence of human occupation.		X	No – previously disturbed land.
Has an AHIMS register search been conducted?	X		Yes, refer Appendix C
Are there any known items of Aboriginal Heritage near the works area (< 1km)?		X	refer Figure 9 and Appendix C
Is consultation with stakeholders required? E.g. the Local Aboriginal Land Council		X	
Is a National Parks and Wildlife Act Section 90 Permit (Aboriginal Heritage Impact Permit – AHIP) required for Aboriginal items potentially impacted by the works?		X	No known items within study area

4.6.4 Environmental Safeguards – Aboriginal Heritage

The following Safeguards for Aboriginal Heritage are part of the Proposal and must be implemented and maintained. Safeguards to be implemented for Aboriginal Heritage are:

- All land ground disturbance activities must be confined to within the study area, as this will eliminate the risk of harm to Aboriginal objects in adjacent landforms. Should the parameters of the proposal extend beyond the assessed areas, then further archaeological assessment is required.
- All staff and contractors involved in the proposed work should be made aware of the legislative protection requirements for all Aboriginal sites and objects.
- If during works Aboriginal artefacts or skeletal material are noted, all work should cease and the procedures in the Unanticipated Finds Protocol (Appendix 2 of the ADD) should be followed.
- Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts (Appendix 3 of the ADD) and are aware of the legislative protection of Aboriginal objects under the National Parks & Wildlife Act 1974 and the contents of the Unanticipated Finds Protocol.
- The information in the ADD meets the requirements of the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales. It should be retained as shelf documentation for five years as it may be used to support a defence against prosecution in the event of unanticipated harm to Aboriginal objects.

Impacts associated with Aboriginal Heritage will not be significant if the above Safeguards are implemented and maintained.



PSC Bore 2 Replacement - Aboriginal Heritage within a 1km radius of Proposal Location

Legend

- Proposed Bore 2
- AHIMS Identified PAD
- 1km Radius
- Study Area
- Subject Site
- Lot Boundaries

Waterways

- Creek
- River
- 1st & 2nd order; unnamed waterways

Roads

- Arterial Road
- Local Road
- Primary Road
- Sub Arterial Road

N 0 100 200 300 m

1 : 12,000

Figure 9 Aboriginal Heritage within a 1 km radius of the proposal

4.7 Biodiversity

4.7.1 Existing environment

The subject site occurs about 13 kilometres east of Forbes, in a predominantly agricultural area along the Lachlan River.

The surrounding study area is compromised of predominantly River Red Gum forest, dominated by River Red Gums(*Eucalyptus camaldulensis)* within the Lachlan River riparian corridor. Areas adjacent to The Escort Way, to the north of the subject site are comprised of a mixture of Yellow Box (*Eucalyptus melliodora),* Fuzzy Box (*Eucalyptus conica)* and Western Grey Box (*Eucalyptus microcarpa).* Groundcover vegetation within the subject site and surrounding study area was highly degraded by weed incursion, and was dominated by exotic species, with very little native understory remaining.

Site assessment was conducted initially on the on July 21 2022, and a brief follow up assessment occurred on 20 March 2023.

Flora

Field surveys identified 23 flora species, of which nineteen (19) are exotic and four (4) are native. These species are listed in Table 13 below.

The subject site includes an existing access track, and a 50 by 50 metre area surrounding the Bore 2 replacement site. The subject site contains an intact overstory dominated by River Red Gum (*Eucalyptus camaldulensis*) with some scattered Yellow Box (*Eucalyptus melliodora*) occurring predominantly to the north of the subject site away from the riparian area. River Red Gum trees in the study area are predominantly mature, old growth trees containing a large proportion of hollows.

The composition of groundcover in the subject site was highly degraded, containing a high cover and abundance of exotic species and weeds such as Vipers Burgloss (*Echium vulgare*), Goosegrass (*Galium aparine*) Purpletop (*Verbena bonariensis*) and Paddy's Lucerne (*Sida rhombifolia*). In particular, vegetation along the existing access track, and in the vicinity of the existing bore location has been degraded and modified by weed incursion, ongoing mechanical maintenance (slashing), and the previous construction of the bore, access track and associated infrastructure, which has resulted in the clearing of native groundcover vegetation, and sealing of the track and surrounding area with gravel and dirt. No shrub layer is present.

Table 13 Flora species recorded on site

Scientific name	Common name	Status
Cerastium glomeratum	Mouse-ear Chickweed	Ex
Chenopodium album	Fat Hen	Ex
Conyza bonariensis	Flaxleaf Fleabane	Ex
Echium vulgare	Viper's Bugloss	Ex
Eragrostis cilianensis	Stinkgrass	Ex
Eucalyptus camaldulensis	River Red Gum	N T

Scientific name	Common name	Status
Galium aparine	Goosegrass	Ex
Lactuca serriola	Prickly Lettuce	Ex
Lactuca serriola	Prickly Lettuce	Ex
Medicago polymorpha	Burr Medic	Ex
Medicago polymorpha	Burr Medic	Ex
Paspalidium spp.	0	N (GG)
Paspalum dilatatum	Paspalum	Ex HTE
Paspalum distichum	Water Couch	N GG
Persicaria prostrata	Creeping Knotweed	N F
Phalaris aquatica	Phalaris	Ex
Phyla nodiflora	Carpet Weed	Ex HTE
Rumex crispus	Curled Dock	Ex
Schinus areira	Pepper Tree	Ex
Sida rhombifolia	Paddy's Lucerne	Ex
Solanum nigrum	Black-berry Nightshade	Ex
Sonchus oleraceus	Common Sowthistle	Ex
Verbena bonariensis	Purpletop	Ex
Xanthium orientale	Californian Burr	Ex
Xanthium spinosum	Bathurst Burr	Ex HTE

EX = Exotic, THE = High Threat Exotic, N = Native, T= Tree, GG = Grass, F = Forb

Plate 7 Large River Red Gum and exotic groundcover dominated by Medicago and exotic species

Plate 8 River Red Gum woodland

Plate 9 Large habitat (hollow-bearing) River Red Gum

Plate 6 Track edges disturbed by weed incursion and routine mechanical maintenance (slashing)

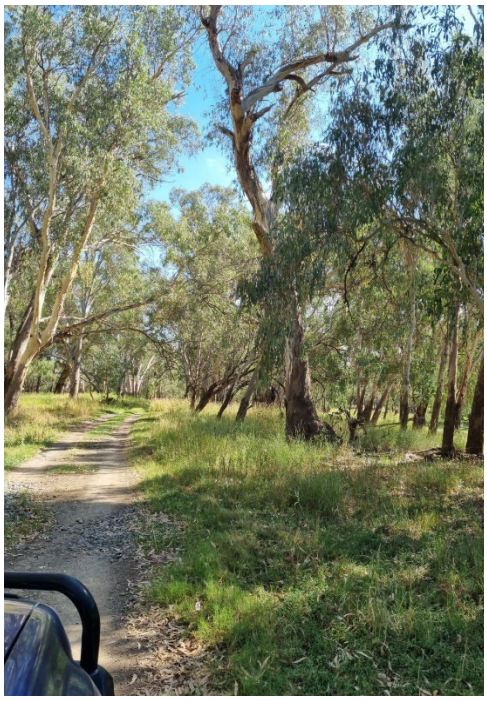


Plate 10 Degraded track edge dominated by exotic grasses and weeds

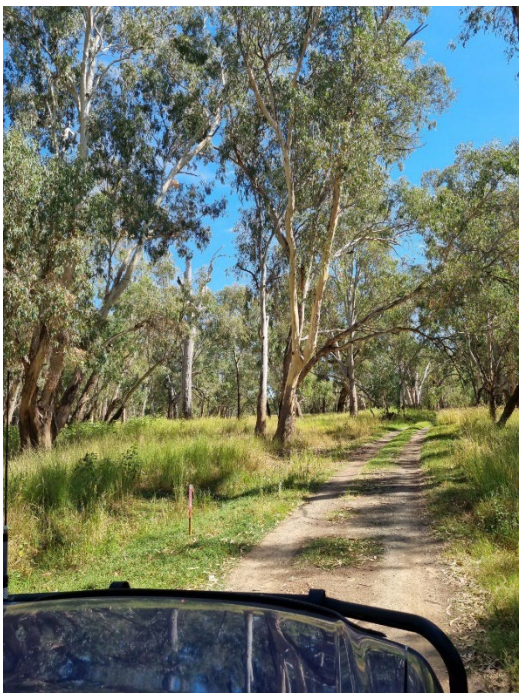


Plate 11 River Red Gum overhanging track and requiring limb-lopping

Priority Weeds

No flora species identified within the subject site are listed NSW Priority Weeds, or Weeds of National Significance (WoNS), however three weeds were identified as High Threat Weeds (HTEs) as follows:

- Paspalum (*Paspalum dilatatum*)
- Carpet Weed/ Lipia (*Phyla nodiflora)*
- Bathurst Burr (*Xanthium spinosum)*

Steps should be undertaken to control and reduce the spread of exotic weeds throughout the study area, particularly during the construction process.

Plant Community Types

Vegetation communities in the study area are shown in Figure 9. There was one NSW plant community types (PCT) identified within the subject site:

- PCT 5 *River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion*.

River Red Gum is the dominant canopy species within the subject site. The composition of the community occurs as a tall, open forest, with an open, grassy groundcover stratum dominated by exotic species. Some scattered Yellow Box were recorded in the study area, and the River Red Gum forest PCT identified is likely grading into adjacent Box-Gum communities (Yellow Box) as the landscape extends away from the riparian area. No shrubs were recorded in the subject site.

Fauna

Surveys undertaken identified eleven fauna species, all of which are native including twelve (12) bird species and one (1) amphibian species heard calling in the nearby waterway. These species are listed in Table 14 below.

Table 14 Fauna species recorded during field surveys

Scientific name	Common name	NSW Status	EPBC Status
Birds			
Cracticus tibicen	Australian Magpie	-	-
Climacteris picumnus victoriae	**Brown Treecreeper**	**V**	**-**
Eolophus roseicapillus	Galah	-	-
Rhipidura albiscapa	Grey Fantail	-	-
Colluricincla harmonica	Grey Shrike-thrush	-	-
Cacatua sanguinea	Little Corella	-	-
Anas superciliosa	Pacific Black Duck	-	-
Trichoglossus moluccanus	Rainbow Lorikeet	-	-
Cacatua galerita	Sulphur-crested Cockatoo	-	-
Malurus cyaneus	Superb Fairy-wren	-	-
Hirundo neoxena	Welcome Swallow	-	-
Rhipidura leucophrys	Willy Wagtail	-	-
Amphibians			
Crinia spp.	Crinia spp.	-	-

Fauna habitat

Woodland

Fauna habitat within the study area occurs mainly as old-growth River Red Gum forest occurring along the Lachlan River riparian corridor.

Woodland in the study area provides foraging and breeding habitat for a variety of bird species. Mature and habitat (hollow-bearing) trees were observed throughout the study area, and nesting behaviour for large cockatoo species such as the Little Corella *(Cacatua sanguinea)* was observed in the area. Hollow-bearing trees are also likely to provide roosting and nesting habitat for microchiropteran bats, arboreal mammals, and a range of other bird species, such as the Sulphur-crested Cockatoo *(Cacatua galerita)* and Galah *(Eolophus roseicapillus)* observed during field surveys.

Abundant foraging habitat is present throughout the study area, which includes native eucalypts, which provide nectar when flowering and insects along branches and amongst leaves for a variety of woodland foraging birds such as the Rainbow Lorikeet *(Trichoglossus haematodus)* and Grey *Fantail*

(Colluricincla harmonica) recorded within the subject site. In particular, the threatened Brown *Treecreeper (Climacteris picumnus victoriae)* is known to particularly favour River Red Gum forests as foraging habitat.

Woody debris in the study area, although limited, is mostly found within woodland areas and is likely to provide suitable habitat for commonly occurring reptiles such as skinks and snakes. Woody debris also provides structural complexity for woodland bird species that utilise it for perching and foraging.

Aquatic

High quality aquatic habitat occurs within the Lachlan River in the study area. The aquatic habitat components of the Lachlan River are known to support a wide variety of fish, crustaceans, insect and frog wetland bird species.

The Lachlan River riparian corridor is also listed as an Endangered Ecological Community (EEC) known as the **Lachlan River endangered ecological community (Lachlan River EEC)** under the NSW *Fisheries Management Act 1994* (FM Act). The Lachlan River EEC includes all fish and aquatic invertebrates within all natural rivers, creeks, streams and associated lagoons, billabongs, lakes, wetlands, paleochannels, flood runners, effluent streams (those that flow away from the river) and the floodplains of the Lachlan River within the State of New South Wales

The proposal occurs about 200 metres from the Lachlan River EEC, and would not involve any work in the vicinity of the Lachlan River, and would not impact on any components of the Lachlan River EEC, including aquatic and riverine habitat, and species.

Threatened biota

BC Act

Threatened biota listed under the BC Act and identified by database searches and field surveys that could potentially occur in the locality are identified in Appendix B.

One BC Act listed threatened bird species, the Brown Treecreeper (*Climacteris picumnus victoriae*) was heard calling in the study area during most recent surveys. The species was not observed within the site, however likely uses it as movement and foraging habitat.

None further BC Act listed threatened ecological communities, species or populations were recorded during site surveys.

The 'likelihood of impact' assessment completed concluded that risk of impacts to threatened biota was unlikely, given that impacts are restricted to the removal of predominantly exotic groundcover and some minor tree limb-lopping. No hollows or habitat trees will be removed as part of the road upgrade works. Subsequently, no threatened species, ecological communities, populations or their habitats listed under either the Commonwealth EPBC Act or the NSW BC Act are considered likely to be impacted by the Proposal. As such, assessments of significance (BC Act & EPBC Act) have not been prepared and a Species Impact Statement or a referral to the Minister for the Environment and Water is not required for this project. *EPBC Act MNES*

EPBC Act

Threatened and migratory biota listed under the EPBC Act and identified by database searches and field surveys that could potentially occur in the locality are identified in Appendix B.

None of the predicted to occur EPBC Act listed threatened ecological communities, species or populations were recorded during site surveys.

As with the EP&A Act assessments of significance, given the unlikelihood (Appendix B and Appendix C) of the proposed works to impact on threatened biota including MNES no assessments of significance under the EPBC Act are required.

4.7.2 Potential Biodiversity Impacts – Construction

Potential impacts to biodiversity associated with the proposal include both direct and indirect impacts, as described below:

Direct impacts

An area of approximately **0.52 ha** would be directly impacted by the proposal.

This area includes upgrades to the access track, which may require minor vegetation disturbance and limb-lopping of overhanging trees along the track, and groundcover disturbance within a 50 by 50 m area at the bore location to allow for drilling activities, excavation and trenching works. No trees would be removed as a result of the proposal.

Groundcover vegetation to be impacted predominantly compromised of exotic grasses and weed species. Within the subject site (particularly along the existing track and in the vicinity of the existing bore) ground cover vegetation has been highly degraded and modified by weed incursion, the previous construction of the bore and associated infrastructure, and ongoing, routine mechanical maintenance (slashing) at the site.

Construction impacts will result in groundcover disturbance and removal only. No mature trees, native shrubs/mid-storey are to be removed as a result of the proposal. No valuable habitat resources will be impacted as a result of the proposed works, as limb-lopping would be restricted to non-hollow-bearing limbs. No threatened flora species or ecological communities are deemed to be significantly affected by the proposed works.

Indirect impacts

Potential indirect impacts to approximately **4.60 ha** of which **2.25 ha** is comprised of native vegetation have also been considered, as follows:

Water quality, chemical and fuel impacts on flora and fauna

The proposal has the potential to cause impacts to native flora and fauna through spills of fuels and chemicals. This may occur during refuelling of machinery. Spills could potentially contaminate habitat for species dependent on aquatic habitat such as frogs and fish.

The proposed impacts of the proposal occurs within 100 metres of the Lachlan River, and subsequently the Lachlan River EEC.

With the implementation of safeguards it is unlikely that the proposal could cause water quality impacts via chemical or fuel spills. The proposal will be constructed in times of dry weather (no major rainfall) to reduce the likelihood of runoff and overland water flows washing chemicals into the nearby Lachlan River.

Introduction and spread of weeds

The groundcover vegetation in the study area contains a range of introduced species. The proposal has the potential to further introduce and spread weeds in the study area through the movement of machinery and light vehicle traffic and disturbance associated with earthworks and construction.

The implementation of safeguards outlined in Section 4.7.4 would limit the potential for the spread of weeds associated with the proposal.

Disturbance, injury and mortality of fauna

The proposal has the potential to temporarily affect the use of the study area by fauna as a result of increased disturbance during construction. The use of plant and machinery may temporarily deter some fauna species such as birds from using potential habitat in the study area during construction.

During construction, death or injury may occur to fauna present during limb lopping of trees and vegetation disturbance, and associated with vehicle movements during construction due to the higher vehicle and machinery presence in the area at the time. If birds are present but not nesting during construction they will generally move away from the proposal site to escape disturbance.

Potential impacts to fauna would be avoided through the implementation of safeguards outlined in section 4.7.4.

Sedimentation of waterways

Sedimentation of waterways (the Lachlan River EEC) may result from earthworks and construction works associated with the proposal. These works have the potential to create loose soils and disturbance which can runoff into nearby waterways and deposit sediment during periods of high rainfall.

Sedimentation has the potential to affect flora and fauna, including macrophytes and aquatic vegetation, fish, frogs, turtles and macroinvertebrates.

Fish normally move away from highly turbid water; however, sedimentation may block fish passage, having detrimental impacts during times of migration. More extreme impacts on fish species, as a result of sedimentation and accompanying turbidity increases in waterways in the wider locality can include:

- smothering of gill surfaces with sediment leading to asphyxiation;
- swallowing of large amounts of sediment leading to illness;
- inhibition of light penetration into the water column which can affect predator-prey interactions; and
- impacts on habitat diversity in the immediate area and downstream by smothering and filling of interstitial spaces inhabited by fish.

Erosion and sedimentation have the potential to occur during construction. Safeguard and management measures outlined below in Section 4.7.4 will reduce the likelihood and severity of this impact occurring, In addition an Erosion and Sediment Control Plan will be prepared and implemented as part of the CEMP, during construction phase of the works.

Key threatening processes

A key threatening process (KTP) is defined in the BC Act as an action, activity or Proposal that:

- adversely affects two or more threatened species, populations or ecological communities; and / or
- could cause species, populations or ecological communities that are not currently threatened to become threatened.

There are currently thirty-nine (39) KTPs listed under the BC Act (DPIE 2021) eight (8) listed under the FM Act (DPI 2021) and twenty-one (21) under the EPBC Act (DCCEEW 2022). Several KTPs are listed under more than one Act.

Several KTP listed under both Acts currently exist within the subject site. The proposal has the potential to add to a number of these, including:

- invasion of native plant communities by exotic perennial grasses;
- clearing of native vegetation; and
- removal of dead wood and dead trees

Impacts of KTPs would be managed via the safeguard and management measures outlined in Section 4.7.4.

4.7.3 Potential Biodiversity Impacts – Operation

No impacts to flora or fauna are expected during the operation of the replacement Bore 2.

Table 15 Biodiversity impacts summary

Description	Y	N	Comments
Are the proposed works likely to involve the removal, pruning or damage to any vegetation including, grass cover, shrubs, trees or Endangered Ecological Communities?	X		Largely non-native groundcover vegetation is to be removed/impacted to upgrade the access road and bore. Some large River Red Gum trees will require pruning to facilitate the widening of the access track. No TEC's or hollow-bearing trees would be impacted along the access track.
Please list the number of trees and/or hollows to be removed as part of the proposed works.	X		Some large River Red Gum trees will require pruning to facilitate the widening of the access track. No TEC's or hollow-bearing trees would be impacted along the access track.
Are the works taking place in a roadside area designated as high or medium conservation value vegetation?		X	The works are not being undertaken in a roadside, and are not impacting on areas designated as high or medium conservation value.
Are there any threatened, endangered, or native flora and/or fauna located within the vicinity of the proposed works?	X		A number of threatened flora and fauna species are recorded as occurring within the locality (Appendix C). No significant impact to any of the species with the potential to occur is expected.

4.7.4 Environmental Safeguards – Biodiversity

The Environmental Safeguards for Biodiversity are considered part of the Proposal and must be implemented. Safeguards to be implemented for Biodiversity are:

Timing of Works

- Where practicable, works are to be completed outside of key breeding seasons (Spring) for species likely to utilise adjacent native vegetation for breeding, to avoid nest abandonment.
- To reduce cumulative impacts to native biota, works are to be timed so as to not directly coincide with other proposals within the Program.

Tree protection

- No canopy vegetation (trees) are to be removed, as impacts to trees are limited to limb lopping only
- Clearly delineate vegetation to be removed/retained with the assistance of an ecologist, or similarly qualified professional, and induct all site personnel as to the approved extent of ground cover vegetation clearing. Ensure that no clearing of vegetation occurs outside of the marked boundary.
- The presence of a suitably qualified arborist is recommended during earthworks occurring near retained trees to avoid rootzones impacts.
- Ensure all work crew understand the importance of habitat features onsite including stags, fallen timber and logs. Avoid impact to all habitat within the subject site wherever possible.

Rehabilitation

- The drill pad and any other excavated areas to be stabilized as soon as possible using the most appropriate combination of the following measures:
    - Hydromulching with appropriate native grass mixture and/or groundcover species;
    - Turfing with appropriate native grass mixture and/or groundcover species,
    - Seeding with appropriate native grass mixture and/or groundcover species; and/or
    - Revegetation using appropriate native tubestock or mature seedlings.
- Areas to be re-seeded may be marked in the CEMP as a record of rehabilitation efforts made. Vegetation cover should be returned to the site within a reasonably practicable timeframe post construction to reduce soil exposure and loss.

General

- Vehicles and machinery not to extend beyond the direct impact footprint.
- Strict hygiene protocols must be followed to ensure that no environmental weeds are spread around during works or are introduced to site as a result of the proposed works. If weeds are accidentally transported to site, or identified during construction activities, all weed material should be immediately contained and removed from site.
- All machinery and vehicles are to be clean and inspected prior to arriving on-site to reduce the spread of weeds and disease (e.g. *Phytophthora cinnamomi*) to the site.
- Locate stockpile sites away from waterways, drainage lines and native vegetation in a cleared area, within pre-approved zones. Ensure these are appropriately stabilized in accordance with the 'Blue Book' (Landcom 2004).
- Appropriate erosion and sediment migration reduction/control measures should be in place.

- Heavy vehicles are not to be parked under tree drip lines/ leaf canopy to avoid compaction of soil, which is damaging to mature native trees and can cause dieback or tree mortality.
- Declared weeds must be managed according to requirements under the Biosecurity Act 2015. All Weeds of National Significance should be managed to ensure they do not spread, and where possible eradicated.

Impacts associated with Biodiversity will not be significant if the above Safeguards are implemented and maintained.

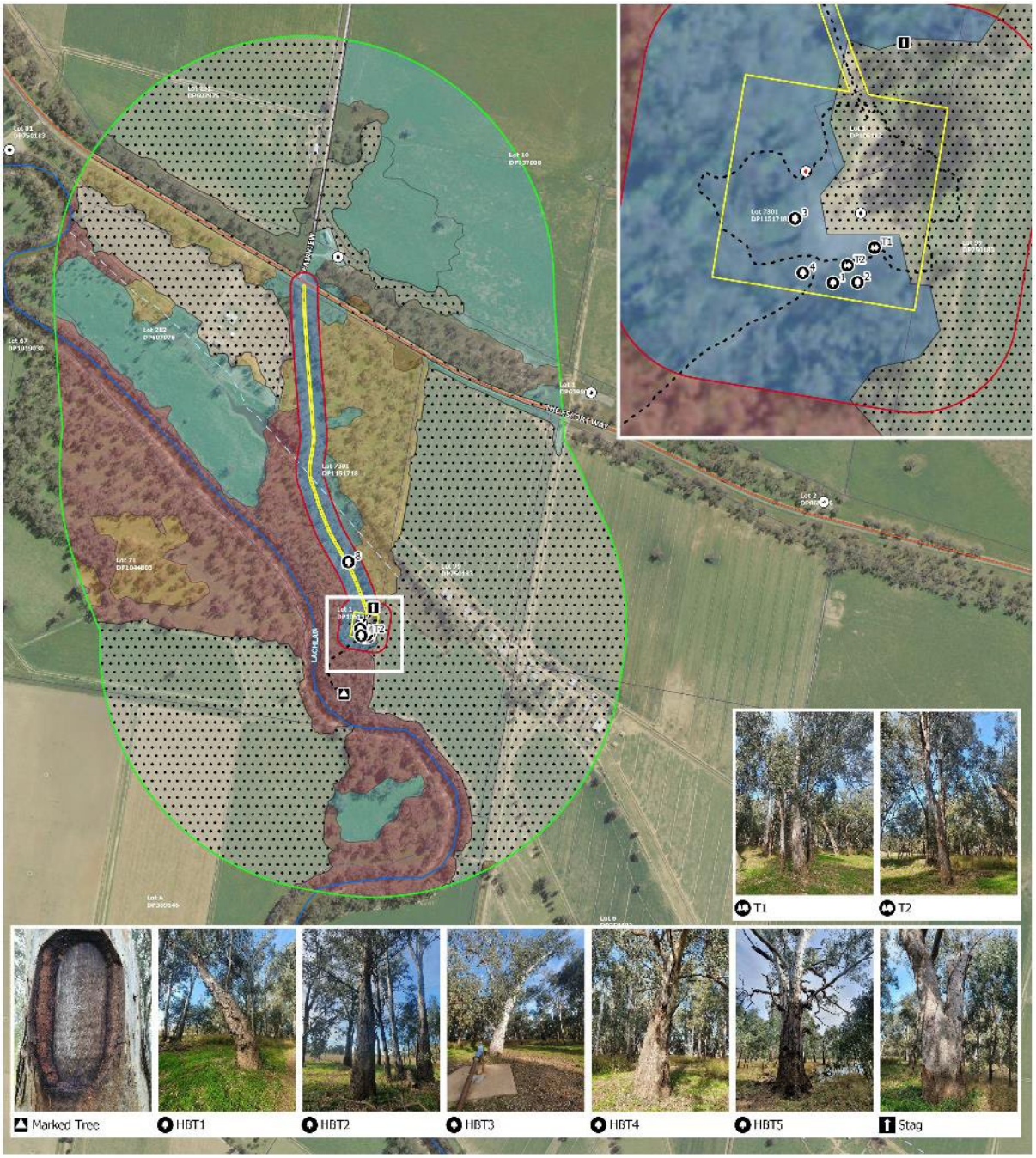
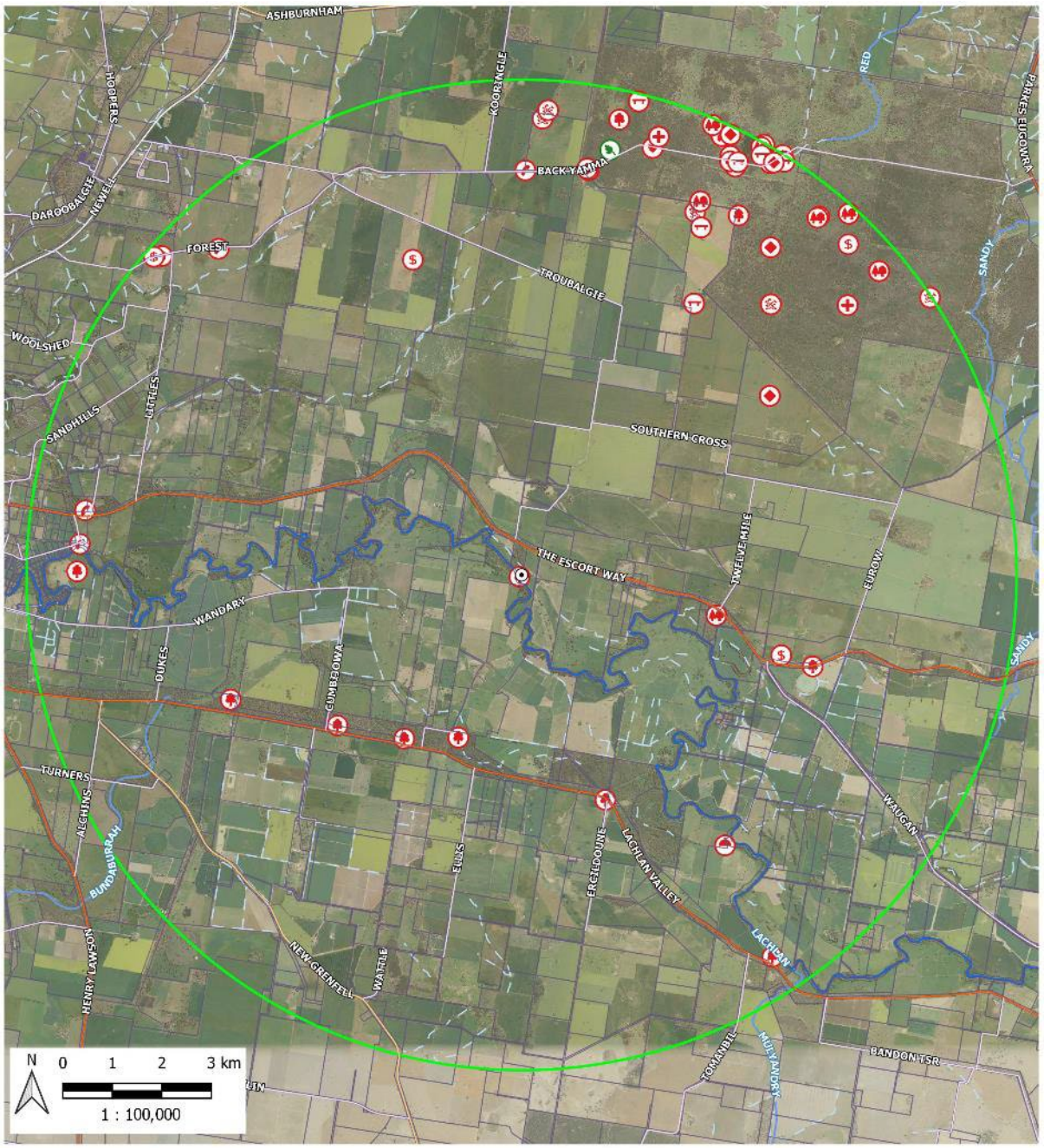


Figure 10 Survey Effort and mapped PCTs within 500m of the proposal location.



PSC Bore 2 Replacement - Threatened Species within 10km of proposal location

Legend

- Proposed Bore 2 Replacement
- 10km Radius
- Lot Boundaries

Roads

- Arterial Road
- Local Road
- Primary Road
- Sub Arterial Rd

Waterways

- Creek
- Gully
- River
- 1st & 2nd order; unnamed waterways

Threatened Species

- A spear-grass
- Black-chinned Honeyeater (eastern subspecies)
- Brown Treecreeper (eastern subspecies)
- Bush Stone-curlew
- Diamond Firetail
- Dusky Woodswallow
- Fork-tailed Swift
- Grey-crowned Babbler (eastern subspecies)
- Hooded Robin (south-eastern form)
- Little Eagle
- Little Lorikeet
- Speckled Warbler
- Superb Parrot
- Swift Parrot
- Turquoise Parrot
- Varied Sittella

Figure 11 Threatened Species recorded within a 10km radius of the subject site

4.8 Traffic and Transport

4.8.1 Existing environment

The subject site is accessed via a gravel property access road off The Escort Way. The Escort Way is an arterial road linking Forbes to Orange via Eugowra that experiences local traffic by rural residents and regular thoroughfare of farm machinery, trucks and heavy vehicles.

During the site inspections, trucks and regular vehicles travelling between regional towns were observed travelling at high speeds along The Escort Way.

4.8.2 Potential Traffic and Transport Impacts – Construction

The proposed bore replacement, access road upgrade, and associated construction is located on Crown Land with no public access, and therefore traffic control will not be required during construction to facilitate the movement of traffic. Machinery and vehicles required to complete the Proposal have good access to the access road, and obstruction to the flow of traffic on The Escort Way is not anticipated.

4.8.3 Potential Traffic and Transport Impacts – Operation

No impacts to traffic or transport are expected during use/operation of Bore 2.

Table 16 Traffic and Transport impacts summary (adapted from Div 1 (2.13) TISEPP 'Consultation Requirements')

Description	Y	N	Comments
Are the proposed works likely to result in major detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access to properties or businesses?		X	
Will there be any permanent major detours made as a consequence of the works?		X	
Does the proposal involve excavation that is not minor or inconsequential of the surface of, or a footpath adjacent to, a road for which a Council is the roads authority under the Roads Act 1993 (if the public authority that is carrying out the development, or on whose behalf it is being carried out, is not responsible for the maintenance of the road or footpath)	X		The access road to Bore 2 will be excavated to a depth of 300 m and reformed using imported material. This will prevent access to the site for the duration of the construction works
Does the Proposal involve the installation of a temporary structure on, or the enclosing of, a public place that is under a Council's management or control that is likely to cause a disruption to pedestrian or vehicular traffic that is not minor or inconsequential		X	The upgrade works will prevent access to the Crown Reserve on which the replacement Bore will be established, however this is anticipated to be temporary and minor due to infrequent use of the reserve
Is the proposal likely to generate traffic that will strain the capacity of the road system in an LGA?		X	

4.8.3 Environmental Safeguards – Traffic and Transport

The Environmental Safeguards for Traffic and Transport are considered part of the Proposal and must be implemented. Safeguards to be implemented for Traffic and Transport are:

Construction

- Consider the location of designated parking areas, stockpile locations, construction laydown sites, site offices, and access routes carefully in consideration of creating inconveniences to local residents, and to the other environmental constraints.
- Works are to minimise impacts to residents/landholders by maintaining vehicular access on The Escort Way at all times.
- All road signs and marking will be in accordance with the RMS Guide to Signs and Markings; Australian Standards AS1742 and AS1743; and the Australian Roads Guide to Traffic Management.
- Traffic and transport complaints are to be monitored and addressed promptly where practicable.

Impacts associated with Traffic and Transport will not be significant if the above Safeguards are implemented and maintained.

4.9 Socio-economic Considerations

4.9.1 Existing environment

The Forbes LGA is a rural community with a population over 8,000 (ABS, 2021) and a population density of 0.02 persons per hectare (FSC 2019). The 2016 census details Professionals as the top employment area for the Forbes region, employing 505 people (or 15.1%). The second dominant employment area is Technicians and Trade Workers (495 people or 14.8%), followed by Managers (487 people or 14.6%).

While the Proposal is within the Forbes Shire, the benefits of the water bore will however be felt in the Parkes Shire. Ultimately the Proposal seeks to secure ongoing access to underground water for the benefit of Parkes and its constituents as part of the broader Parkes Town Water Security Program.

Parkes is a rural community with a population of over 14,000 (ABS, 2021) and a population density of 0.03 persons per hectare (PSC 2015). Farming, fishing and agriculture is one of the top three (3) employment areas for the Parkes region employing 680 people (or 11.3 %). The two (2) other dominant employment areas include retail and health services professions, while approximately 10 % of the community is employed in the combined fields of construction and wholesale trade.

The study area is located on Crown Land, surrounded by agricultural land adjacent the Lachlan River, approximately 13 km east of the Forbes township. The study area itself has an existing access road, and the proposed replacement bore location is within land previously cleared for the existing Bore 2 and associated infrastructure. The proposed trenching to accommodate pipework and electrical work to the to join with the existing infrastructure on the site will fall within the 50 x 50 m drill pad subject site area, identified as Crown Land (Lot 7301 DP 1151718).

4.9.2 Potential Socio-economic Impacts – Construction

During the construction phase of the Proposal, it is expected that local contractors from Forbes and/or Parkes regions will be employed. Approximately 3 contractors will be employed over a period of 8 weeks to complete all facets of the Proposal. The Proposal is being partly funded by Critical Drought Relief funding, and it is anticipated that contractors will provide income to local cafes, businesses, and accommodation providers throughout the duration of the construction.

Due to the relative isolation of the site, it is not anticipated that any local residents will be impacted during the construction phase, with the closest private residences located approximately 200 m to the east of the study area, accessed via a gravel road from The Escort Way. The 'Springfield' homestead is identified approximately 450 m to the south east of the study area, and the 'Innisfail' homestead is identified approximately 1 km to the south of the study area, accessed via a gravel road from The Escort Way and the Lachlan Valley Way respectively.

4.9.3 Potential Socio-economic Impacts – Operation

The operation of the bore, as part of the overarching Parkes Town Water Security Program is anticipated to provide positive socio-economic impacts during its operation as it provides the residents of Parkes with critical drought security water.

There are no changes or limitations anticipated at the site following the construction phase of the Bore 2 replacement.

Table 17 Socio-economic Considerations impacts summary (adapted from Div 1 (2.13) TISEPP 'Consultation Requirements')

Description	Y	N	Comments
Are the proposed works likely to impact on local business, require any property acquisition, or alter any access or parking arrangements for properties (either temporarily or permanently)?		X	
Is the development adjacent to land reserved under the National Parks and Wildlife Act 1974 or to land acquired under Part 11 of that Act (if so, consultation is required with the Office of Environment and Heritage),		X	
Is the development on land in Zone C1 National Parks and Nature Reserves or in a land use zone that is equivalent to that zone, other than land reserved under the (if so, consultation is required with National Parks and Wildlife Act 1974the Office of Environment and Heritage),		X	
Does the development comprise a fixed or floating structure in or over navigable waters(if so, consultation will be required with Transport for NSW),		X	
Is the development located on defence communications facility buffer land within the meaning of clause 5.15 of the Standard Instrument (if so, consultation is required with the Secretary of the Commonwealth Department of Defence, Note— Defence communications facility buffer land is located around the defence communications facility near Morundah. See the Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhart Local Environmental Plan 2012, Narrandera Local Environmental Plan 2013 and Urana Local Environmental Plan 2011.		X	
Is the development on land in a mine subsidence district within the meaning of the Mine Subsidence Compensation Act 1961—(if so, consultation is required with the Mine Subsidence Board),		X	
Is the development within a Western City operational area specified in the Western Parkland City Authority Act 2018, Schedule 2 with a capital investment value of $30 million or more—(if so, consultation is required with the Western Parkland City Authority constituted under that Act).		X	

4.9.4 Environmental Safeguards – Socio-economic considerations

The Environmental Safeguards for Socio-economic Considerations are considered part of the Proposal and must be implemented.

Safeguards to be implemented for Socio-economic impacts are:

- Considerate construction practices are to be implemented at all times during works, including the construction site is to be left in a clean and tidy manner at the end of each workday, and noise, air quality and visual amenity impacts are to be kept to a minimum.
- All materials purchased for the Proposal are to be of highest quality and most sustainable as possible, to reduce impacts to community and ratepayers through replacement of low-quality or faulty equipment in the future.
- Quality assurance is to be applied to all aspects of the Proposal, including design and construction to ensure best value for the local community.

- Disruption of traffic is to be minimised wherever possible and clear communication and planning between construction crew and landowners is to be undertaken.
- Community engagement is to be undertaken to obtain feedback on concerns, and address issues as they arise.
- Construction machinery and work vehicles to be discretely parked when not in use to reduce visual impact and ensure safe pullover is available where possible.

The Proposal will not have significant negative impacts on Socio-economic Considerations if the above Safeguards are implemented and maintained.

4.10 Waste and Resource Use

4.10.1 Existing environment

The subject site includes native bushland with a cleared area for the existing Bore 2 and associated infrastructure, overhead electricity wires and poles are also located within the subject site. Fenced lucerne paddocks occur within the eastern part of the study area. Excluding cropping and fencing activity, and the aforementioned infrastructure, no anthropogenic disturbance in the form of discarded waste was observed on site and the area was considered tidy.

The current operation of the area as water extraction site and lucerne cropping paddock and general agricultural enterprise would result in minor wastes and use of finite resources such as fuels and electricity.

4.10.2 Potential Waste and Resource Use Impacts – Construction

Waste products generated by the construction phase of the Proposal may include but are not limited to:

- soil and spoil and, excess civil construction materials;
- cleared vegetation (predominantly non-native);
- packaging;
- domestic and general waste; and
- chemical wastes.

The construction of the proposed Bore 2 and associated infrastructure is anticipated to use finite resources, in the form of stainless steel casing, electrical cable, concrete, metals and plastic, as well as consumption of fuels and electricity as part of construction activities.

Following casing and screening of the replacement bore, flushing the bore is anticipated to generate up to 15 kL of silt / sludge. The sludge will be removed from site and disposed of at a suitably licenced waste management facility. Following the removal of the first contaminated discharge, including silt, mud and drilling chemicals, the clean water will be discharged to the Northparkes Mine via the existing Bore 2 pipeline. It is recommended turbidity monitoring of the water is undertaken prior to during the 72 hr pump test.

4.10.3 Potential Waste and Resource Use Impacts – Operation

No waste products will be generated as part of operation of the Proposal. Operation of the Bore pumps in addition to some personnel and maintenance vehicular use will contribute to fuel and energy consumption.

Table 18 Waste impacts summary

Description	Y	N	Comments
Are the proposed works likely to generate >200 tonnes of waste material (contaminated and /or non-contaminated material)?		X	No; most excavated material will be reused in backfilling the trenches after pipe installation has been completed. Material removed during drilling will be removed from site and disposed of appropriately.

Description	Y	N	Comments
Are the proposed works likely to require a Licence from NSW EPA for waste?		X	No; unless Council elects to discharge up to 15 ML of water to the environment during the 72 hr pump testing of the production bore, in which case a miscellaneous discharge permit would be required. However, Council have elected to discharge the water to the Northparkes Mine reservoir 1B.
Will the ongoing operation of the site post completion of works generate significant amount of waste?		X	Minimal wastes will be generated unless the infrastructure is replaced in future.

4.11 Visual Amenity

4.11.1 Environmental Safeguards – Waste and Resource Use

The Environmental Safeguards for Waste and Resource use are considered part of the Proposal and must be implemented.

Safeguards, with regard to waste in general, to be implemented are:

- All wastes generated as part of this Proposal will be managed in accordance with the *Protection of the Environment Operations Act 1997*, and EPA and Council guidelines.
- Resource management hierarchy principles are to be followed; namely, the avoidance, reduction, reuse and recycling of resources.
- If stockpile or laydown sites are required in locations that have not been considered as occurring within the impact footprint as part of this REF, additional approval will need to be sought prior to any clearing taking place.
- Requirements under the Landcom (2004) stockpile management procedure must be observed, including correct placement of earth banks (with sedimentation ponds) to divert water around stockpiles if placed on a slope, and/or filter fences erected below stockpiles to capture any sediment moving offsite.
- Bulk project waste (e.g. clean virgin excavated natural material or clean fill) sent to a site not owned by Council (excluding DPIE licensed landfills) for land disposal is to have prior formal written approval from the landowner.
- Waste is not to be burnt on site and all general waste will be contained and disposed of at suitable waste facilities.
- Where possible, materials with recycled content will be sourced, and minimum quantities ordered to reduce wastage.
- If contamination is encountered during construction, a site assessment must be undertaken in accordance with the *Protection of the Environment Operations Act 1997* (POEO Act).
- Toilets will be provided for construction workers for the duration of the works to prevent human wastes entering the waterway.
- Waste management for construction projects should be undertaken in accordance with the NSW *Waste Avoidance and Resource Recovery Act 2001*. The objectives of the Act are:

  - To encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of Ecologically Sustainable Development (ESD);
  - to ensure that resource management options are considered against a hierarchy of the following order: Avoidance of unnecessary resource consumption, Resource recovery (including reuse, reprocessing, recycling and energy recovery), disposal;
  - to provide for the continual reduction in waste generation;
  - to minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste;
  - to ensure that industry shares with the community the responsibility for reducing and dealing with waste;
  - to ensure the efficient funding of waste and resource management planning, programs and service delivery;
  - to achieve integrated waste and resource management planning, programs and service delivery on a State-wide basis;
  - to assist in the achievement of the objectives of the *Protection of the Environment Operations Act 1997*.
- Don't over-order, to ensure wastes are reduced from procurement through to commissioning.

The Proposal will not have significant negative impacts on waste generation and resource use if the above Safeguards are implemented and maintained.

4.11.2 Existing environment

The study area is located in a rural area with both native bushland and cleared paddocks. The area is not densely populated and located far enough out of town to limit interference with the public. The general amenity along The Escort Way is pleasant with remnant native vegetation, minimal litter and tidy property entryways present.


Plate 12 Visual landscape in the study area

4.11.3 Potential Visual Amenity Impacts – Construction

During construction, the proposed works would affect the visual environment by the presence of machinery, construction vehicles and equipment. The machinery and scale of works required for the bore are not significant, and with the exclusion of the private residence 200 m to the east, there are no nearby sensitive receivers and the impact on visual amenity during construction is not expected to be significant.

4.11.4 Potential Visual Amenity Impacts – Operation

The operation of the proposed water bore will not involve any additional visible infrastructure at the site that would impact on the visual environment of the immediate area. The replacement bore and infrastructure will not be visible from the road and will therefore not impose on the visual amenity of the area.

Table 19 Visual Amenity impacts summary (adapted from Div 1 (2.13) TISEPP 'Consultation Requirements')

Description	Y	N	Comments
Are the proposed works likely to have an impact on the visual amenity of the surrounding area? (i.e. removal of vegetation, stockpile sites, road widening etc.)	X		Temporary construction presence that may be visible from The Escort Way. Minor ongoing impact of bore infrastructure largely not visible from the road.
Will the development increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (note – the Dark Sky Region is land within 200 km of the Siding Spring Observatory		X	

4.11.5 Environmental Safeguards – Visual amenity

The Environmental Safeguards for Visual Amenity are considered part of the Proposal and must be implemented. Safeguards to be implemented with regards to Visual Amenity are:

- The works area is to be kept free from rubbish and stockpile sites actively managed.
- Vehicles are to be parked in designated areas only.
- No additional, unauthorised clearing or destruction of vegetation is to occur.
- Cleared, bare patches of ground that form part of the works are to be revegetated and restored following cessation of works.
- Obvious and intrusive signs/machinery/equipment are to be removed from the site at the first opportunity.
- Any complaints received regarding visual amenity at the site are to be dealt with and rectified as soon as possible.

The Proposal will not have significant negative impacts on Visual Amenity if the above Safeguards are implemented and maintained.

4.12 Climate Change

4.12.1 Existing Environment

Long-term meteorological data for the surrounding area is available from the nearby Bureau of Meteorology (BoM) Forbes Airport weather station. The weather station is located approximately 22 km west of the subject site and records observations of several meteorological data including temperature, humidity and rainfall, wind speed and wind direction.

Long-term climate statistics for the area are presented in Table 20. The area has a mild climate with an average annual maximum temperature of 24.5 degrees Celsius. January is the hottest month, with a mean maximum temperature of 34.5 degrees Celsius and July is the coldest month, experiencing a mean maximum temperature of 14.7 degrees Celsius.

Rainfall is typically uniform across the seasons, with some variability experienced from year to year. March is recorded as the wettest month with an average rainfall of 55.5 mm falling, with April the driest month at 28.7 mm. The yearly average stands at 493 mm of rain.

Table 20 Long-term climate averages at the closest weather station (Forbes Airport 065103)

Observation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean observations													
Maximum Temperature (°C)	34.5	32.7	29.3	24.7	19.4	15.5	14.7	16.5	20.7	25.2	29.1	31.9	24.5
Rainfall (mm)	33.3	51.5	55.5	28.7	32.4	49.8	38.6	33.5	40.6	41.6	45	51.3	493.0

Climate Change predictions

The NSW Government Office of Environment and Heritage (OEH) AdaptNSW division 'Climate Change snapshot' for Central West and Orana, states that the region is projected to continue to warm during the near future (2020 – 2039) and far future (2060 – 2079), compared to recent years (1990 – 2009). There is very high confidence that the average temperatures will increase across seasons. Warming is projected to be on average about 0.7°C in the near future, increasing to about 2.1°C in the far future. The number of hot days is projected to increase and the number of cold nights is projected to decrease.

Climate change projections are presented for emission scenarios that will impact the degree to which the climate is altered in the future; each of these is referred to as a 'representative concentration pathway' (RCP) and is representative of the concentration of global GHG emissions in the atmosphere under different emissions scenarios. For example, if GHG emissions are mitigated and reduced, the scenario is for 'low emissions' and is referred to as RCP 2.6; conversely, if little effort is made to reduce emissions and the current scenario is continued globally, a 'high emissions' concentration is referred to as RCP 8.5, indicating a high concentration of GHG emissions in the atmosphere moving forward, with potentially devastating impacts by the year 2100.

Under a high emissions scenario (RCP8.5), NSW and the ACT can expect an average annual temperature increase of around 1.4 - 2.3 °C, whereas large and sustained reductions in global GHG emissions (RCP2.6) reduce projected warming to around 0.7 - 1.4 °C. Specifically for Parkes, under

emissions scenario RCP 8.5 for the projected time period of 2090, an increase in temperature of 4.2 °C is expected, combined with a drop of -12 % for rainfall (Climate Change in Australia, Analogues Explorer, 2021).

Parkes and Forbes currently experience an average of 20–30 hot days each year; an additional 20 to 30 hot days are projected for these areas.

Parkes, Forbes and Cowra are predicted to experience an increase in rainfall across Summer, Autumn and Winter, and a decrease in Spring; rainfall changes are associated with changes in extremes, such as floods and droughts. The changes to water quality, potential for erosion and sediment migration, damage to infrastructure and localized flooding complications are associated with these sudden or extreme changes.

The subject site does not occur within a designated bushfire prone area (NSW Rural Fire Service, 2021) however with a harsher fire-weather climate predicted in the future (high confidence), improved water security in the area will help to ensure the safety of the community.

4.12.2 Potential Climate Change Impacts – Construction

Throughout the construction phase of the Proposal there will be use of in-demand materials. Use of these materials diminishes the availability of some resources for future use and contributes to pollution and GHG emissions through both direct use of fuels and the embodied energy used in the production of construction materials, and in association with the disposal of related waste products. The use of fossil fuels would also contribute to impacts on climate and air quality. While these impacts would be negligible on global or national scales, efficient resource use should be adopted as a general operating principle, including use of locally sourced materials and locally based construction crews to reduce 'carbon miles' and increase efficiencies.

4.12.3 Potential Climate Change Impacts – Operation

This Proposal is intended to proceed along with others within the Program, although this Proposal does not cause the other proposals within the Program to proceed. Each proposal is independent, however there may be operational activities that occur in parallel, which could result in additional climate change impacts.

Potential impacts to climate change could be expected during use/operation of Bore 2, depending on the source of electricity. However, impacts from climate change, including possible changes to flooding regimes along the Lachlan River and availability of groundwater in a drier climate, may impact on the operation of the bore over time.

4.12.4 Environmental Safeguards – Climate Change

The following Safeguards for Climate Change are part of the Proposal and must be implemented and maintained as part of project delivery. Safeguards to be implemented with regards to Climate Change are:

Construction

- Resource management hierarchy principles are to be followed:
    - Avoid unnecessary resource consumption as a priority;

    - Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery); and
    - Disposal is undertaken as a last resort (in accordance with the Waste Avoidance & Resource Recovery Act 2001).
- Council to ensure the renewable energy systems installed are adequate to provide energy for the operation of the proposed works.
- Quality assurance and life cycle of materials are to be considered when purchasing, to ensure the newly built infrastructure is resilient and structurally sound.
- Local resources are to be used wherever possible, to reduce waste and increase efficiencies.

Operation

- Regular maintenance of machinery associated with bore to ensure energy efficiency.
- Consider the use of renewal energy sources for ongoing bore operation to reduce fossil fuel consumption.

Provided the above Safeguards are implemented as part of the Proposal, the Proposal is not likely to have a significant impact on Climate Change.

5 CONSIDERATION OF STATE AND COMMONWEALTH ENVIRONMENTAL FACTORS

This section considers the Proposal against key legislation and government policy. This section does not describe the legislation and policy in detail and guidance provided here does not constitute legal advice.

5.1 Matters of National Environmental Significance

Under the environmental assessment provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the following Matters of National Environmental Significance (MNES) are required to be considered to assist in determining whether the Proposal should be referred to the Australian Government Department of Climate Change, Energy, The Environment and Water (DCCEEW).

Table 21 Compliance with EPBC Act 1999

Factor	Impact
Any impact on a World Heritage property? State whether the proposal would impact on a World Heritage property.	Nil
Any impact on a National Heritage place? State whether or not the proposal would impact on a National Heritage place**.**	Nil
Any impact on a wetland of international importance?	Nil
Any impact on a listed threatened species or communities?	No significant impacts, refer Section 4.7
Any impacts on listed migratory species?	Unlikely, refer Section 4.7
Any impact on a Commonwealth marine area?	Nil
Any impact on the Great Barrier Reef Marine Park?	Nil
Does the proposal involve a nuclear action (including uranium mining)?	Nil
Additionally, any impact (direct or indirect) on Commonwealth land?	Nil

5.2 Environmental Planning and Assessment Regulation, 2021 Checklist

The factors which need to be taken into account when considering the environmental impact of an activity are listed in the DPE Guidelines. Those factors have been taken into account when assessing the likely impacts of the Proposal on the natural and built environment in this REF and are summarised in Table 22 below.

There are numerous other projects which are proceeding in parallel with the proposed Bore 2 replacement proposal. These include the following:

- The Parkes Special Activation Precinct (SAP)
- The expansion of the North Parkes Mine
- Investment in the Parkes Regional Airport, and
- Development associated with the Inland Rail.

The current status of the above projects is that the environmental assessments and approvals have not all been fully documented. However, it is likely that the environmental impacts of those developments include increased traffic and increased noise and vibration during the construction phase, as well as increased removal of native vegetation, additional usage of water and finite resources.

The Proposal is not and will not be instrumental in assisting these other projects to proceed; however, water supplied by the replacement Bore 2 which is part of the Proposal and the overall Program will be offered by Council as a standard municipal service to the abovementioned projects, potentially resulting in additional end users of the Parkes town water supply. Also, construction impacts arising from this Proposal may occur in parallel to the abovementioned projects.

The Proposal is also intended to proceed alongside other proposals within the Program. Each of those proposals are independent of one another, being funded separately and subject to separate project delivery timeframes and environmental considerations. However, there may be construction activities for different proposals that occur in parallel, which could result in cumulative traffic, noise and vibration, visual amenity, air quality, surface and groundwater, climate change, socio-economic and biodiversity impacts.

As PSC is the Proponent for the overall Program and its individual proposals, the Proposal will be scheduled to be completed so as to minimise any cumulative effects of the separate proposals in the Program proceeding at the same time.

Table 22 Compliance with the DPE Guidelines

Environmental Factor	Will there be an impact?	Comments
(a) Any environmental impact on a community?	Yes	Construction: minor, short-term impacts are expected due to road closures during construction. Operation: Positive outcomes for the Parkes township community through increased surety of water supply into the future.
(b) Any transformation of a locality?	Yes, minor	Construction: excavation and construction works within and adjacent to public roads will cause localized, temporary impacts. Removal of smaller trees in vicinity of Bore 2 will alter the landscape. Operation: minor changes to the environment with the presence of a new Bore structure and upgraded road access.

Environmental Factor	Will there be an impact?	Comments
(c) Any environmental impact on the ecosystems of a locality?	Yes, minor	Construction: Minor impact to groundcover and some canopy vegetation of ecosystem present, though not significant. Minor short-term indirect impacts to adjacent vegetation possible, not deemed significant (Section 4.7). Operation: resumption of use of the site as an operational Bore post completion of the construction phase is not expected to result in significant impacts to ecosystems in the locality.
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?	No	
(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present generations?	No	Assuming all of the Environmental Safeguards are adhered to.
(f) Any impact on habitat of any protected fauna (within the meaning of the National Parks and Wildlife Act 1974)?	Yes	Minor short-term impacts only, not deemed significant (Section 4.7)
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?	No	Assuming all the Environmental Safeguards are adhered to.
(h) Any long-term effects on the environment?	No	
(i) Any degradation of the quality of the environment?	No	Assuming all the Environmental Safeguards are adhered to.
(j) Any risk to the safety of the environment?	No	
(k) Any reduction in the range of beneficial uses of the environment?	No	
(l) Any pollution of the environment?	No	Assuming all the Environmental Safeguards are adhered to.

Environmental Factor	Will there be an impact?	Comments
(m) Any environmental problems associated with the disposal of waste?	No	Assuming all the Environmental Safeguards are adhered to.
(n) Any increased demands on resources, natural or otherwise which are, or are likely to become, in short supply?	Yes	Water extraction from bore operation within current allocation for PSC water licence, and below current sustainable levels. Conversion of existing Bore 2 to a monitoring bore, to no longer be used for production, will offset water extraction from the replacement Bore 2.
(o) Any cumulative environmental effect with other existing or likely future activities?	No	
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	No	Construction: not on the coast Operation: not on the coast
(q) Any applicable local strategic planning statement, regional strategic plan or district management plan made under Division 3.1 of the Act	Yes	Refer to Parkes Local Strategic Planning Statement (Parkes Shire Council, 2020). The delivery of water security infrastructure aligns with Planning Priority 5.
(r) Any other relevant environmental factors	Minor; temporary	Construction: other factors considered include community and stakeholder consultation and property matters, including Crown Land. Operation: no other factors have been considered other than those listed above.

6 Certification

This REF provides a true and fair review of the Proposal in relation to its likely effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the Proposal.

This report has been developed in accordance with the *NSW Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) and the Department of Planning and Environment's Guidelines for Division 5.1 assessments (DPE Guidelines) and demonstrates how the environmental factors specified in the DPE Guidelines were taken into account when considering the likely impact of the proposed activity.

The assessment has concluded that the proposed works as described in this REF, providing all proposed management measures and Safeguards are implemented, will not result in a significant impact on the environment. An Environmental Impact Statement (EIS) is not required.

The proposed works will not result in a significant impact on any declared critical habitat, threatened species, populations or ecological communities or their habitats. Therefore, a Species Impact Statement (SIS) is not required.

The proposed works are not being carried out on Commonwealth land, are unlikely to affect any Commonwealth land, or have any significant impact on any Matters of National Environmental Significance. However, the study area is located on Crown Land, with approval from the NSW Crown Lands department (Crown Lands) required prior to project commencement.

All proposed work contemplated as part of the Proposal will be completed under the guidance of a Construction Environmental Management Plan (CEMP) to manage and minimise potential environmental impacts, particularly ecological impacts, associated with the proposed work. Once operational, the Proposal is not expected to cause any significant environmental or community impacts.

I certify that I have reviewed and endorsed the contents of this REF document, and, to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under section 171(1) of the EP&A Regulation, and the information it contains is neither false nor misleading.

Prepared by:	Reviewed and Endorsed for Certification by:
Name: Kate Farrell	Name: Emily Cotterill
Title: GIS and Environmental Consultant	Title: Director and Principal Consultant
Date: 08/03/2023	Date: 08/03/2023

Determiner declaration and approval

I have reviewed this REF and determine that the Proposal will not have a significant impact on the environment and can proceed subject to the controls outlined in this REF.

Name:

Title:

Date:

7 References

BOM 2021 weather observations at Forbes Airport weather station

Climate Change in Australia, 2021; Climate Analogues https://www.climatechangeinaustralia.gov.au/en/projections-tools/climate-analogues/analogues-explorer/

DAWE 2021 Species Profile and Threats Databases

DAWE 2021 Protected Matters Search Tool for MNES listed under the EPBC Act. http://www.environment.gov.au/epbc/protected-matters-search-tool

DPI 2021 Priority Weeds of the Central West NSW WeedWise

DPI 2021 Weeds of National Significance NSW WeedWise

DPIE 2021 Areas of Outstanding Biodiversity register Area of Outstanding Biodiversity Value register | NSW Environment, Energy and Science

DPIE 2021 Biodiversity Values Map https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap

DPIE 2021 Key threatening processes http://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/about-threatened-species/key-threatening-processes accessed Feb 2021

DPIE 2021 SEPP Koala Habitat Protection 2020 Koala Habitat Protection SEPP - (nsw.gov.au)

DPIE 2021 NSW Government Vegetation Regulatory Map https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=NVRMap

DPIE 2021 Bionet Wildlife Atlas Threatened species records, which holds data from a number of custodians.

New South Wales Flora online – PlantNET 2021 http://plantnet.rbgsyd.nsw.gov.au/floraonline.html

NSW LPI mapping https://maps.six.nsw.gov.au/, accessed April 2021

NSW OEH 2020 'Central West and Orana Climate Change Snapshot', Adapt NSW

NSW Planning and Environment Department 2018, planning portal http://www.planning.nsw.gov.au/ accessed April 2021

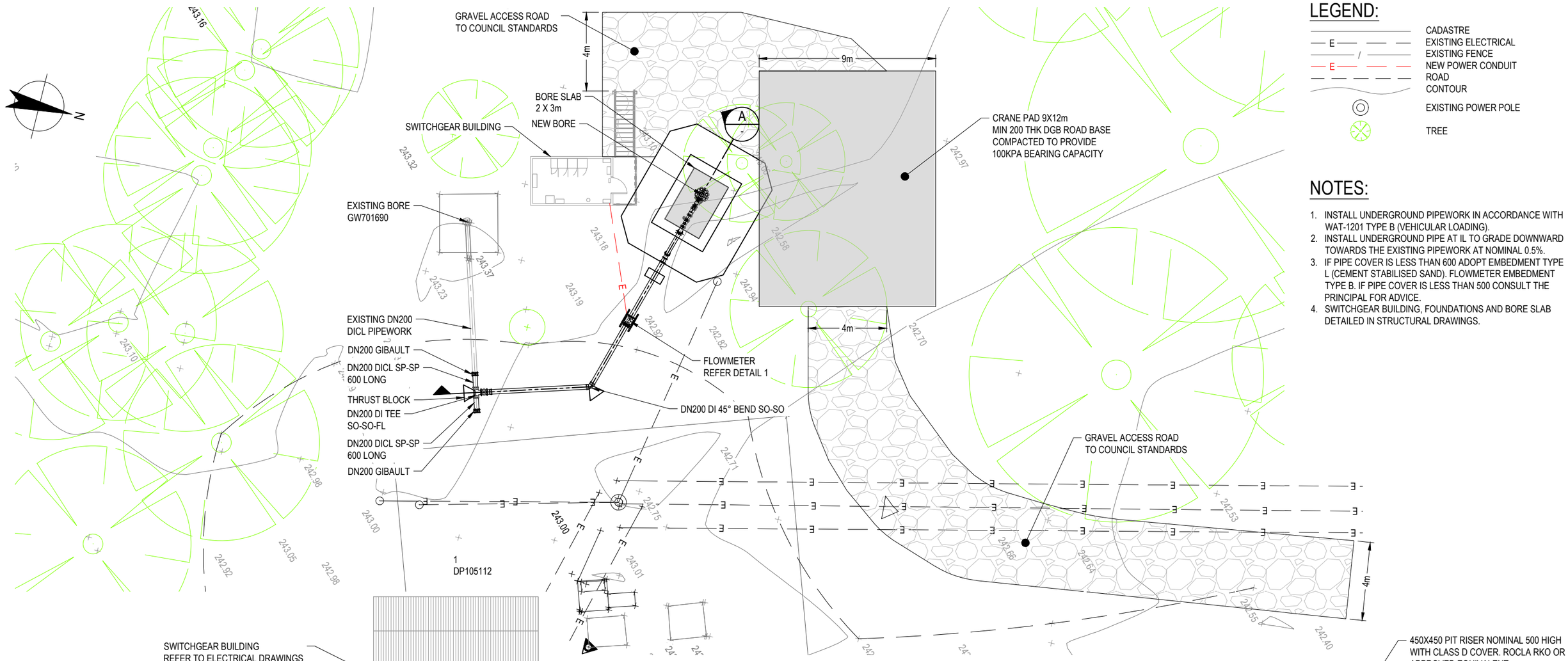
NSW Rural Fire Service (2021) www.rfs.nsw.gov.au

OEH 2018, Great Soil Group (GSG) Soil Type map of NSW http://www.environment.nsw.gov.au/eSpade2Webapp#, accessed April 2021

8 Appendices

Appendix	Description
Appendix A	– Design Drawings
Appendix B	– Biodiversity assessment and 'Likelihood of Impact' assessment methodology
Appendix C	– Likelihood of Occurrence and Likelihood of Impact Assessment
Appendix D	– Aboriginal Due Diligence Report
Appendix E	– Summary of Safeguards

Appendix A – Design Drawings



LEGEND:

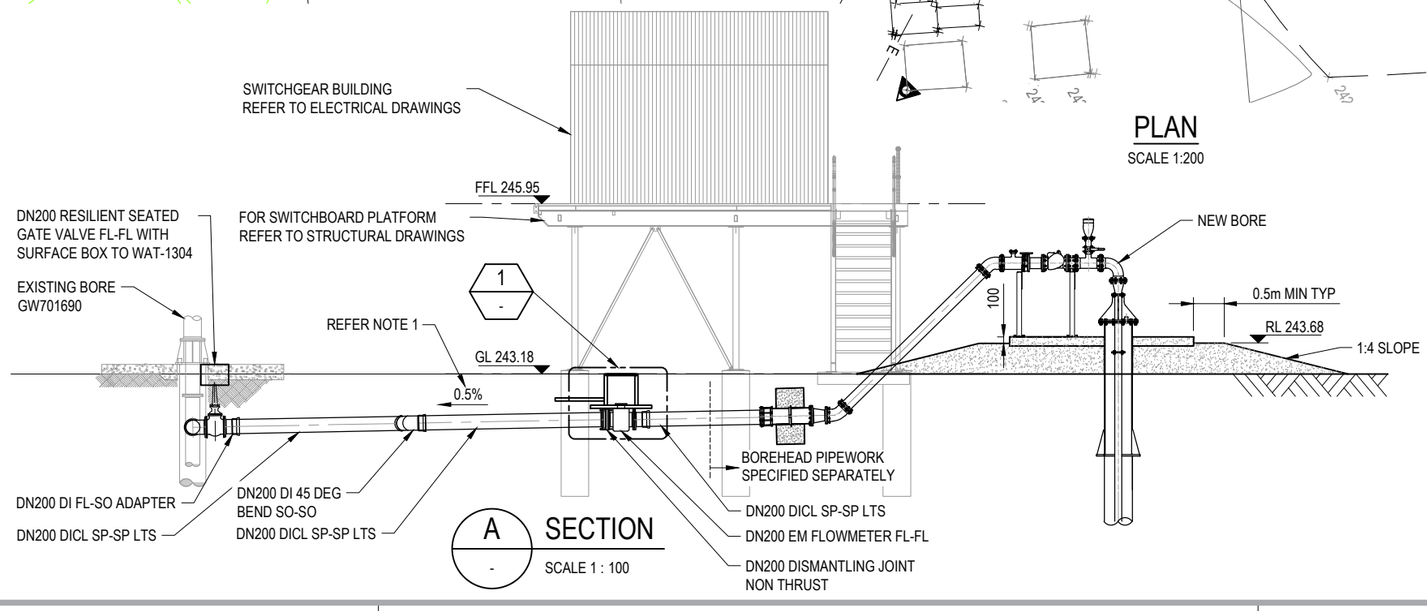
- CADASTRE
- EXISTING ELECTRICAL
- EXISTING FENCE
- NEW POWER CONDUIT
- ROAD
- CONTOUR
- EXISTING POWER POLE
- TREE

NOTES:

1. INSTALL UNDERGROUND PIPEWORK IN ACCORDANCE WITH WAT-1201 TYPE B (VEHICULAR LOADING).
2. INSTALL UNDERGROUND PIPE AT IL TO GRADE DOWNWARD TOWARDS THE EXISTING PIPEWORK AT NOMINAL 0.5%.
3. IF PIPE COVER IS LESS THAN 600 ADOPT EMBEDMENT TYPE L (CEMENT STABILISED SAND). FLOWMETER EMBEDMENT TYPE B. IF PIPE COVER IS LESS THAN 500 CONSULT THE PRINCIPAL FOR ADVICE.
4. SWITCHGEAR BUILDING, FOUNDATIONS AND BORE SLAB DETAILED IN STRUCTURAL DRAWINGS.

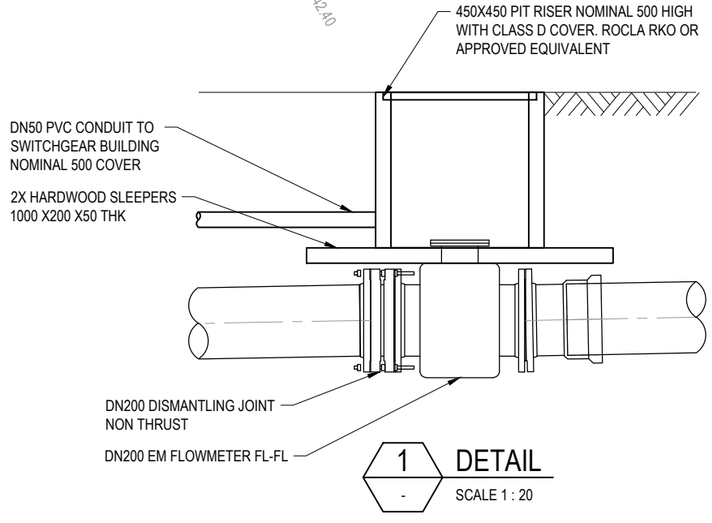
PLAN

SCALE 1:200



A SECTION

SCALE 1 : 100



1 DETAIL

SCALE 1 : 20

Rev	Description	Checked	Approved	Date
C	PRELIMINARY ISSUE	-	-	17/11/22
B	PRELIMINARY ISSUE	-	-	16/11/22
A	PRELIMINARY ISSUE	-	-	26/09/22

Author J. MANALO Drafting Check
Designer L. CEDILLA Design Check R. TUCKER

0 0.2 0.4 0.6m
SCALE 1:20 AT ORIGINAL SIZE

0 2 4 6m
SCALE 1:200 AT ORIGINAL SIZE

0 1 2 3m
SCALE 1:100 AT ORIGINAL SIZE

Parkes Shire Council
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GHD Pty Ltd

Project No. 12544113

Client PARKES SHIRE COUNCIL

Project EUGOWRA RESERVOIR PIPEWORK

Drawing Title PARKES BORE 2 SMP
PLAN AND SECTION

Size A3

Status PRELIMINARY Status Code S3

Drawing No. 12544113-W021

Rev C

Plot Date: 17 November 2022 - 2:10 PM Plotted by: Jes Manalo

File Name: G:\22\12544113\CADD\Drawings\12544113-W021.dwg

Appendix B – Biodiversity assessment and 'Likelihood of Impact' assessment methodology

DESKTOP ASSESSMENT

A desktop assessment was undertaken to identify threatened flora and fauna species, populations and ecological communities listed under the BC Act, and MNES listed under the EPBC Act that may be affected by the Proposal. The results of the desktop assessment were then used to guide on-site field investigations.

Database Searches

The desktop assessment included a review of background biodiversity information obtained from database searches and literature reviews. These searches included:

- DPIE Wildlife Atlas database records of threatened species and endangered ecological communities listed BC Act that have been recorded within the locality of the subject site (DPIE 2021, data accessed 25th March 2021).
- Department of the Environment and Energy (DEE) Protected Matters Search Tool for Matters of National Environmental Significance (MNES) listed under the EPBC Act recorded or predicted to occur in the locality of the site (DCCEEC 2022), updated report generated 20th July 2022).
- OEH threatened species profiles online database (DPIE 2021).
- DEE online species profiles and threats database (DAWE 2021).
- State Vegetation Type Map: Central Tablelands Region Version 0.1. VIS_ID 4778, to identify native vegetation types occurring within the study area and the likely presence of any threatened ecological communities (OEH 2019).
- SEPP Koala Habitat Protection – 2020.

Vegetation Mapping

GIS mapping was completed prior to surveys being undertaken to inform ecologists of the habitats and vegetation likely to be on site and to provide a visual representation of vegetation communities present within the study area, as well as any previous records of threatened species recorded.

FIELD SURVEY

Biodiversity field surveys were conducted by one TEF field ecologist on 21st July 2022. The TEF field ecologist was accompanied by PSC representatives, who provided TEF staff with an overview of the site and a description of the works to be undertaken.

The primary objectives of the field surveys were to:

- Determine the presence and/or potential habitats for threatened flora and fauna species, populations, ecological communities, listed under the NSW BC Act, NSW FM Act and Commonwealth EPBC Act, to occur in the study area
- Ground-truth SVTM mapping and determine PCTs present within the site and surrounding study area

- Determine the value of the habitat in the study area for flora and fauna species, particularly for threatened species and species of conservation significance, and describe potential impacts that would result from the proposal
- Describe the flora and fauna species, habitat, populations and ecological communities in the study area in relation to their occurrence and quality in the locality. This included ground truthing, reference to aerial photographs and plant community type mapping
- Determine the extent of vegetation removal required for the proposal including Threatened Ecological Communities (TECs).

Terrestrial Flora Survey

Vegetation communities were initially assigned based on predicted State Vegetation Type Mapping (SVTM) for the region. During the site assessment vegetation communities were ground-truthed. Dominant and key species were recorded, and vegetation formation, class, structure and condition was assessed.

The study area was then surveyed on foot via random transect surveys, and incidental observations of flora species were recorded. As rare plants often exist in discrete populations in specific areas, a random search can increase the probability of finding rare plant populations. A random search effort also encompasses a greater portion of the landscape, as the search is not limited to specific areas (only the stratification unit), and is useful in surveying difficult terrain and irregular shaped search areas.

Through this process, intact native vegetation communities were then defined according to BioNet vegetation classification, and assigned Plant Community Types (PCT) (OEH 2020c). Introduced or highly modified native vegetation was defined based on structure and species composition. All PCTs were mapped using aerial photographic interpretation guided by the field survey results and GPS data.

Terrestrial Fauna Survey

Fauna surveys were conducted for all fauna groups, and included habitat assessment and incidental observations of fauna presence and signs during the site assessment. Potential fauna resources include shelter, basking, roosting, nesting and foraging sites for birds, bats, arboreal mammals, amphibians, ground-dwelling mammals and reptiles.

Habitat tree and hollow assessments on site included active searches for the following habitat features:

- Trees with bird nests or other potential fauna roosts
- Rock outcrops or overhangs providing potential shelter sites for fauna
- Woody debris
- Feed trees, such as Allocasuarina species and Mistletoe presence
- Burrows, dens and warrens, bridges, culverts and hollow-bearing trees for evidence (e.g. guano or bat droppings) of roosting microbats
- Waterbodies
- Hollow-bearing trees and logs which provide refuge, nest and den sites for a range of threatened fauna species
- Koala food trees and/or evidence of scratches or scats
- Distinctive scats or latrine sites, owl whitewash and regurgitated pellets under roost sites
- Tracks or animal remains

- Evidence of activity such as feeding scars, scratches and diggings
- Leaf litter and fallen timber were inspected for reptile habitat
- Presence of potential habitat for threatened frog species

Species observed during site surveys were recorded as opportunistic observations. Any indirect evidence of fauna (e.g. scats, feathers, fur, tracks, dens, nests, scratches, chew marks and owl wash) was recorded and/or photographed.

Assessment of the likelihood of occurrence and likelihood of impact

An assessment of the likelihood of occurrence and possibility of impact was completed for listed species, populations and ecological communities with the potential to occur in the study area.

In assessing which of these species, populations and ecological communities are 'likely' to occur within the study area (as described in 'Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Working Draft') (DEC 2004) the following factors were taken into consideration:

- The presence of potential habitat within the study area
- Condition and approximate extent of potential habitat within the study area
- Species occurrence within the locality and region (including results of current and previous surveys and results of database searches and literature review).

In addition, the possibility of impact by the proposal on threatened biota likely to occur, or present was assessed, and therefore whether a BC Act assessment of significance and/or EPBC Act significance assessment is required to assess the significance of the impact.

ASSUMPTIONS AND LIMITATIONS

Surveys were undertaken outside the optimal survey period for flora species. Surveys were undertaken in winter when many plant species are not detectable because they have not yet flowered or flower in autumn. For threatened flora species that were not detectable at the time of the survey, but which had the potential to occur at the site, an assessment was made of the suitability of the habitat for the species and its likelihood of occurrence.

Some fauna species are mobile and transient in their use of resources. Consequently, it is likely that not all species either resident or transitory to the site would have been recorded during field surveys. The disadvantage of this limitation was reduced by undertaking database searches, and by assessing the habitat value of the study area for threatened and migratory species known to occur in the wider area to determine their likelihood of occurrence (Appendix B).

This survey was not designed to enable all species, either resident or transitory to the study area, to be detected. Instead, it was aimed at providing an overall assessment of the ecological values of the study area with particular emphasis on threatened and migratory species to allow an assessment of the potential impacts of the proposal. For those species of conservation significance that were not detected but with the potential to occur in the study area, an assessment of the likelihood of their occurrence was made based on known habitat requirements.

Appendix C – Likelihood of Occurrence and Likelihood of Impact Assessment

The below map (Figure 12) and assessment includes national and state significant species from the following sources:

- Bionet (April 2022)
- DAWE database (PMST accessed February 2022)
- Search area is 10 km radius.
- Not considered further pelagic seabirds, shorebirds, sandpipers, turtles, whales, sharks - no preferred marine or coastal habitat in Study area.

All habitat information is taken from NSW OEH and Commonwealth DEE Threatened Species profiles (DPIE 2020 DEE 2020) unless otherwise stated. The codes used in this table are:

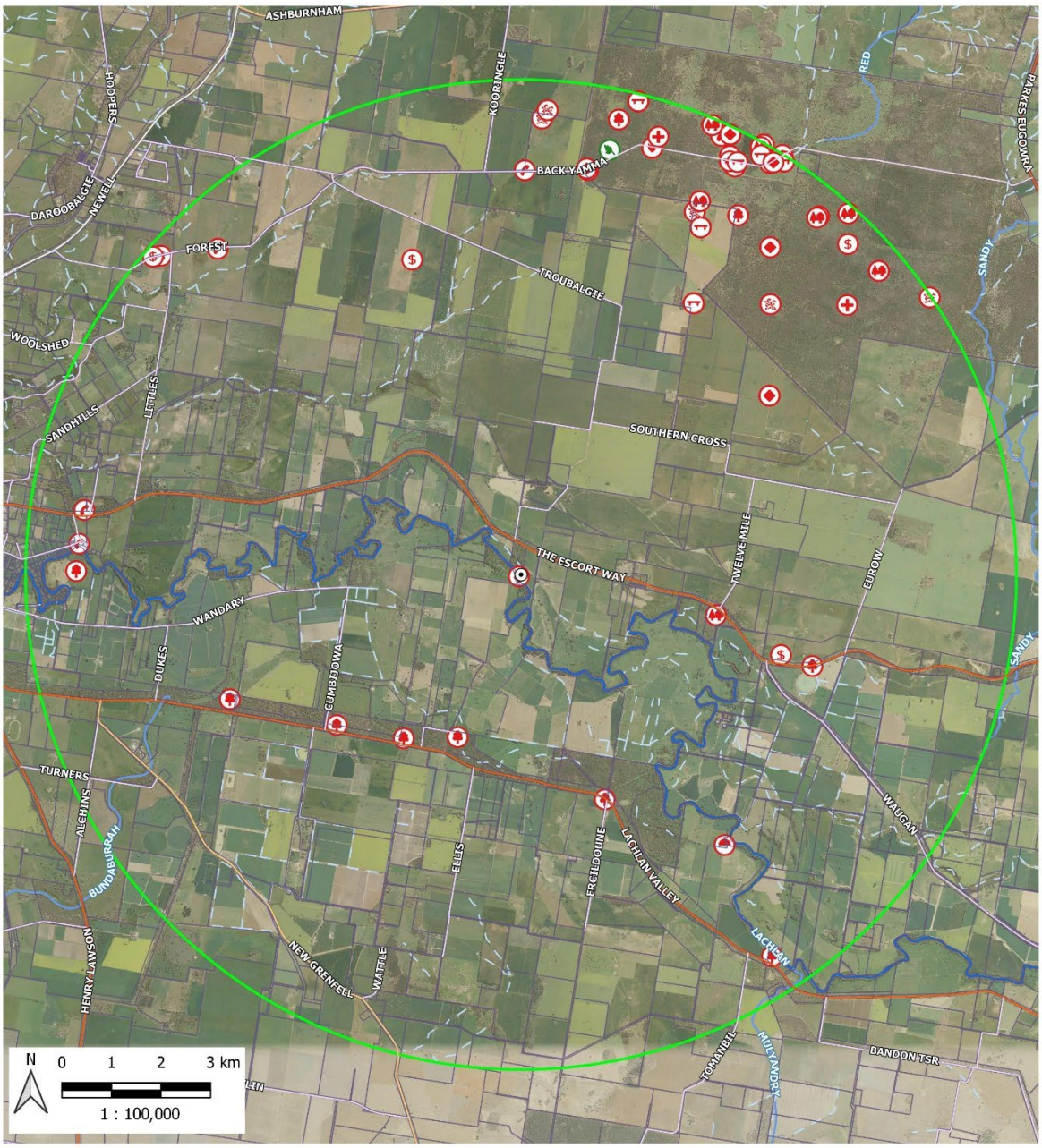
- CE – Critically Endangered
- E – Endangered
- V – Vulnerable
- EP – Endangered Population
- C – CAMBA
- J – JAMBA
- R – ROKAMBA
- CEEC – Critically Endangered Ecological Community
- EEC – Endangered Ecological Community

Table 23 Likelihood of Occurrence definitions

Likelihood of occurrence	Definition
Recorded	Species recorded in the subject site or Study area
High	Species previously recorded within a 10 kilometre radius of the subject site and suitable habitat occurs within the subject site.
Moderate	Species previously recorded within a 10 kilometre radius of the subject site but only marginal suitable habitat recorded. OR Species not previously recorded within a 10 kilometre radius of the subject site, but the Proposal footprint is within the species known distribution and suitable habitat occurs within the Study area.
Low	Species previously recorded within a 10 kilometre radius of the subject site but no suitable habitat recorded.
Nil	Species not previously recorded within a 10 kilometre radius of the subject site and no suitable habitat occurs in the area.

Table 24 Likelihood of impact definitions

Likelihood of impact	Definition
Unlikely	Species/ community will not be impacted by the Proposal.
Likely	Species/ community will be impacted by the Proposal.



PSC Bore 2 Replacement - Threatened Species within 10km of proposal location

Legend

- Proposed Bore 2 Replacement
- 10km Radius
- Lot Boundaries

Roads

- Arterial Road
- Local Road
- Primary Road
- Sub Arterial Rd

Waterways

- Creek
- Gully
- River
- 1st & 2nd order; unnamed waterways

Threatened Species

- A spear-grass
- Black-chinned Honeyeater (eastern subspecies)
- Brown Treecreeper (eastern subspecies)
- Bush Stone-curlew
- Diamond Firetail
- Dusky Woodswallow
- Fork-tailed Swift
- Grey-crowned Babbler (eastern subspecies)
- Hooded Robin (south-eastern form)
- Little Eagle
- Little Lorikeet
- Speckled Warbler
- Superb Parrot
- Swift Parrot
- Turquoise Parrot
- Varied Sittella

Figure 12 Threatened species recorded in the locality

Table 25 Likelihood of occurrence and likelihood of impact assessment summary

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Amphibia							
Crinia sloanei	Sloane's Froglet	V	E	Sloane's Froglet has been recorded from widely scattered sites in the floodplains of the Murray-Darling Basin, with the majority of records in the Darling Riverine Plains, NSW South Western Slopes and Riverina bioregions in New South Wales. It is typically associated with periodically inundated areas in grassland, woodland and disturbed habitats.	PMST	**Moderate** Suitable aquatic habitat in the study area and locality	**Unlikely** No impacts to aquatic habitat or habitat likely to support the species
Aves/Birds							
Botaurus poiciloptilus	Australasian Bittern	E	E	Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. Preferred habitat is comprised of wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and reeds (e.g. Phragmites, Cyperus, Eleocharis, Juncus, Typha, Baumea, Bolboschoenus) or cutting	PMST	**Moderate** Suitable aquatic habitat in the study area and locality	**Unlikely** No impacts to aquatic habitat or habitat likely to support the species

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				grass (Gahnia) growing over a muddy or peaty substrate.			
Rostratula australis	Australian Painted Snipe	E	E	The Australian Painted Snipe is restricted to Australia. Most records are from the south east, particularly the Murray Darling Basin. This species occupies wetland and swamp habitats, preferring the fringes of swamps and dams with a cover of grasses, reeds, scrub or woodland. Breeding occurs anytime during spring and summer when conditions are favourable. It nests on the ground amongst tall vegetation.	PMST	**Moderate** Suitable aquatic habitat in the study area and locality	**Unlikely** No impacts to aquatic or wetland habitat or any habitat likely to support the species
Ninox connivens	Barking Owl	V	-	Found throughout continental Australia except for central arid regions. The Barking Owl requires large tree hollows in order to roost and breed. It occupies open forests and woodlands including partially cleared farmland. They often roost in densely formed Acacia and Casuarina species. Known to successfully breed along timbered watercourses in heavily cleared habitats, where a higher density of prey is found around fertile riparian soils. A large portion of its diet consists of arboreal mammals but can adapt to ground dwelling species where the habitat cannot sustain preferred prey. Requires very large permanent territories in most habitats due to sparse prey densities.	Bionet	**High** Species previously recorded in the locality, and suitable habitat present in the Study area	**Unlikely** No impacts to habitat features (i.e hollow-bearing trees) likely to support the species

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Falco subniger	Black Falcon	V	-	The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. Tree lined watercourses and isolated woodlands in arid and semi-arid areas are preferred nesting and roosting habitat. Large old trees are a resource that is critical for nesting and hunting.	Bionet	**Moderate** Species previously recorded in the locality, and some marginal habitat present (foraging)	**Unlikely** Species is highly mobile and unlikely to depend on minor components of habitat to be removed (i.e no removal of foraging or breeding habitat)
Melithreptus gularis gularis	Black-chinned Honeyeater	V	-	The Black-chinned Honeyeater is widespread throughout NSW, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is rarely recorded east of the Great Dividing Range, although regularly observed from the Richmond and Clarence River areas. The Black-chinned Honeyeater occupies open woodland habitats and open forests of smooth gums, stringybarks, ironbarks and Casuarinas and Melaleucas. They require large foraging territories of woodland patches at least 5 hectares large.	Bionet	**Moderate** Suitable woodland habitat present in the study area	**Unlikely** Limb lopping of a small number of River Red Gum trees overhanging the track is unlikely to reduce the availability of foraging resources to an extent that would detrimentally impact the species. Ample alternant habitat available in the surrounding study area, and within the Lachlan River riparian corridor
Climacteris picumnus victoriae	Brown Treecreeper	V	-	The eastern subspecies of Brown Treecreeper lives in eastern NSW in eucalypt woodlands through central NSW and in	Bionet	**Recorded**	**Unlikely** Limb lopping of a small number of River

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
	(eastern sub-species)			coastal areas with drier open woodlands such as the Snowy River Valley, Cumberland Plains, Hunter Valley and parts of the Richmond and Clarence Valleys with its western boundary of the range running approximately through Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell. This species territory is in open woodland habitats (including Box-Gum Woodland), prefering woodlands dominated by stringybarks and rough barked eucalypts with a grassy understory. It requires tree hollows in live and dead trees or stumps for nesting.		Species recorded calling during site surveys	Red Gum trees overhanging the track is unlikely to reduce the availability of foraging resources to an extent that would detrimentally impact the species. Ample alternant habitat available in the surrounding study area, and within the Lachlan River riparian corridor
Burhinus grallarius	Bush Stone-curlew	E	-	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range. The Bush Stone-curlew occupies open grassy woodland habitat with sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights.(Sourced from NSW Office of Environment - Threatened species profile 2022)	Bionet	**Moderate** Known to occur in the locality, however study area lacked suitable habitat for the species – highly degraded and open, understory lacking habitat features the species requires (i.e fallen timber and sheltering habitat) Site highly modified	**Unlikely** Suitable habitat features not present within the study area, and would not be impacted by the Proposal .

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
						and disturbed, and unlikely to support the species	
Calidris ferruginea	Curlew Sandpiper	E	CE - Migratory Wetland	Mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. Inland records are probably mainly of birds pausing for a few days during migration.	PMST	**Moderate** Suitable aquatic habitat in the study area and locality	**Unlikely** No impacts to aquatic habitat or habitat likely to support the species
Stagonopleura guttata	Diamond firetail	V	-	The Diamond Firetail tends to occur in proximity to watercourses building small dome nests in shrubs and dense foliage. It is found within Box-Gum Woodlands, Snow Gum Woodlands, open forests, mallee, Natural Temperate Grassland and in secondary grasslands derived from other communities. This species forages on grasses, forbs and insects along the ground.	Bionet	**High** Known to occur in the locality. Suitable habitat present within the study area	**Unlikely** Limb lopping of a small number of River Red Gum trees overhanging the track is unlikely to reduce the availability of foraging resources to an extent that would detrimentally impact the species. Ample alternant habitat

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
							available in the surrounding study area, and within the Lachlan River riparian corridor
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	Dry, open eucalypt forests and woodland are the preferred habitat. Mallee associations with a sparse understorey of eucalypt saplings, acacias and other shrubs and ground cover of grasses or sedges and woody debris are also inhabited. Farmland, particularly forest or woodland edges are also inhabited and very occasionally, moist forest or rainforest.	Bionet	**High** Known to occur in the locality. Suitable habitat present within the study area	**Unlikely** Limb lopping of a small number of River Red Gum trees overhanging the track is unlikely to reduce the availability of foraging resources to an extent that would detrimentally impact the species. Ample alternant habitat available in the surrounding study area, and within the Lachlan River riparian corridor
Petroica phoenicea	Flame Robin	V	-	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at	Bionet	**High** Known to occur in the locality. Suitable habitat present within the study area	**Unlikely** Limb lopping of a small number of River Red Gum trees overhanging the track is unlikely to reduce

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				high altitudes. In winter, birds migrate to drier more open habitats in the lowlands (i.e. valleys below the ranges, and to the western slopes and plains). Nests are often near the ground and are built in sheltered sites, such as shallow cavities in trees, stumps or banks.			the availability of foraging resources to an extent that would detrimentally impact the species. Ample alternant habitat available in the surrounding study area, and within the Lachlan River riparian corridor
Callocephalon fimbriatum	Gang-gang Cockatoo	V	E	This species is nomadic, spending summer in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests and winter at lower altitudes in drier more open eucalypt forest and woodlands, particularly in coastal areas. This species nests in hollow-bearing trees close to water with breeding taking place between October and January. Favours old growth forest and woodland attributes with dense understoreys, for nesting and roosting. Nests are located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts.	PMST	**Low** No previous records for the species in the locality. Does not breed in the region. Does not typically occur in the western regions, preferring the coast	**Unlikely** Unlikely to occur, and no habitat to be impacted
Pachycephala inornata	Gilbert's Whistler	V	-	The Gilbert's Whistler is sparsely distributed over much of the arid and semi-arid zone of inland southern Australia, from the western	Bionet	**Moderate** Known to occur in the locality.	**Unlikely** Limb lopping of a small number of River

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				slopes of NSW to the Western Australian wheatbelt. The Gilbert's Whistler occurs in a range of habitats within NSW, though the shared feature appears to be a dense shrub layer. It is widely recorded in mallee shrublands, but also occurs in box-ironbark woodlands, Cypress Pine and Belah woodlands and River Red Gum forests, though at this stage it is only known to use this habitat along the Murray, Edwards and Wakool Rivers. Its food consists mainly of spiders and insects such as caterpillars, beetles and ants, and occasionally, seeds and fruits are eaten. Breeding takes place between August and November. Nests are usually built below about two and a half metres (but up to six metres) above the ground in the fork of dense foliage of plants such as wattles or cypress pines.(DPE 2022)		Marginal suitable habitat present within the study area	Red Gum trees overhanging the track is unlikely to reduce the availability of foraging resources to an extent that would detrimentally impact the species. Ample alternant habitat available in the surrounding study area, and within the Lachlan River riparian corridor
Falco hypoleucos	Grey Falcon	E	-	Restricted to shrubland, grassland and wooded watercourses and sometimes near wetlands where surface water attracts prey. Occasionally found in open woodlands near the coast. Nests are constructed in high living eucalypts near a watercourse.	PMST	**Moderate** Species previously recorded in the locality, and some suitable habitat present in the study area	**Unlikely** Species is highly mobile and unlikely to depend on habitat to be removed (i.e no removal of foraging or breeding habitat)

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V	-	The Grey-crowned Babbler occupies Box-gum woodlands, Box-cypress-pine and Box Woodlands on alluvial plains. They construct several large dome stick nests within a territory and breed cooperatively during the warmer months. Birds are generally unable to cross large open areas.	Bionet	**High** Suitable woodland habitat present in the study area, and known to occur in nearby road reserves	**Unlikely** Limb lopping of a small number of River Red Gum trees overhanging the track is unlikely to reduce the availability of foraging resources to an extent that would detrimentally impact the species. Ample alternant habitat available in the surrounding study area, and within the Lachlan River riparian corridor
Melanodryas cucullata	Hooded Robin	V	-	The Hooded Robin is found widespread across Australia, except for the driest deserts and the wetter coastal areas. It prefers lightly wooded forests such as eucalypt woodlands, acacia scrub and mallee with structurally diverse habitats including saplings, tall native grasses and an abundance of fallen leaf litter and woody debris to forage. They occupy home ranges of 10 hectares to 30 hectares throughout the year.	Bionet	**Moderate** Suitable woodland habitat present in the study area	**Unlikely** Limb lopping of a small number of River Red Gum trees overhanging the track is unlikely to reduce the availability of foraging resources to an extent that would detrimentally impact the species. Ample

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
							alternant habitat available in the surrounding study area, and within the Lachlan River riparian corridor
Hieraaetus morphnoides	Little Eagle	V	-	The Little Eagle occupies habitats rich in prey within open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used. For nest sites it requires a tall living tree within a remnant patch, where pairs build a large stick nest in winter and lay in early spring.	Bionet	**Moderate** Species previously recorded in the locality, and suitable habitat present in the Study area	**Unlikely** Species is highly mobile and unlikely to depend on habitat to be removed (i.e no removal of foraging or breeding habitat)
Glossopsitta pusilla	Little Lorikeet	V	-	In NSW Little Lorikeets are distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri. They are considered nomadic responding to food availability and highly gregarious often foraging in mixed flocks. They occur in dry, open eucalypt forests and woodlands using roadside vegetation. They rely on nectar and pollen, particularly on profusely-flowering eucalypts, melaleucas and mistletoes. On the western slopes and tablelands White Box E. albens and Yellow Box E. melliodora are	Bionet	**High** Suitable woodland habitat present in the study area	**Unlikely** Limb lopping of a small number of River Red Gum trees overhanging the track is unlikely to reduce the availability of foraging resources to an extent that would detrimentally impact the species. Ample alternant habitat available in the surrounding study

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				particularly important food sources for pollen and nectar respectively. They often return to the same nest hollow annually preferring smooth barked Eucalypts with small hollows (3 cm entrance diameter).			area, and within the Lachlan River riparian corridor
Leipoa ocellata	Malleefowl	E	V	Historically found widely throughout Australia, Malleefowl are now mostly limited to areas of inland semi-arid scrub. It requires light sandy loam soils with a diverse shrub and understory. They prefer a dry environment with low-growing eucalypt trees and shrubs, referred to as mallee country. Feeds mostly on ants and the seeds of wattle and senna plants.	PMST	**Nil** No suitable mallee habitat present	**Unlikely** Species unlikely to occur
Grantiella picta	Painted Honeyeater	V	V	A nomadic species inhabiting Boree/ Weeping Myall (Acacia pendula), Brigalow (A. harpophylla) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema. Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	PMST	**Low** Preferred habitat is not present in the study area. No records in the locality	**Unlikely** Species unlikely to occur

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Certhionyx variegatus	Pied Honeyeater	V	-	Inhabits wattle shrub, primarily Mulga (Acacia aneura), mallee, spinifex and eucalypt woodlands, usually when shrubs are flowering; feeds on nectar, predominantly from various species of emu-bushes (Eremophila spp.); also from mistletoes and various other shrubs (e.g. Grevillea spp.); also eats saltbush fruit, berries, seed, flowers and insects. Highly nomadic, following the erratic flowering of shrubs; can be locally common at times.	Bionet	**Moderate** Habitat likely to support the species does not occur in the study area	**Unlikely** Species unlikely to occur
Anthochaera phrygia	Regent Honeyeater	CE	CE	The Regent Honeyeater is a migratory woodland bird moving across the landscape in response to climatic conditions and food availability. This species prefers Box-Ironbark woodland and riparian forests particularly habitats with mature trees, high canopy cover and abundance of mistletoes. Nonbreeding flocks occasionally seen in coastal areas foraging in flowering Spotted Gum and Swamp Mahogany forests, presumably in response to drought.	Bionet / PMST	**Moderate** Species prefers Box-ironbark communities. Preferred habitat not present.	**Unlikely** Minor loss of non-preferred habitat unlikely to impact the species
Petroica boodang	Scarlet Robin	V	-	In NSW, this species occupies open forests and woodlands from the coast to the inland slopes. It breeds in drier eucalypt forests and temperate woodlands, often on ridges and slopes, within an open understorey of shrubs and grasses and sometimes in open areas.	Bionet	**Moderate** Moderate suitable woodland habitat present in the study area	**Unlikely** Limb lopping of a small number of River Red Gum trees overhanging the track is unlikely to reduce

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				Abundant logs and coarse woody debris are important structural components of its habitat. In autumn and winter it migrates to more open habitats such as grassy open woodland or paddocks with scattered trees.			the availability of foraging resources to an extent that would detrimentally impact the species. Ample alternant habitat available in the surrounding study area, and within the Lachlan River riparian corridor
Chthonicola sagittata	Speckled Warbler	V	-	The Speckled Warbler occupies open Eucalypt woodlands with a grassy understory and often rocky outcrops. Relatively large undisturbed areas are required to sustain this species in an area.	Bionet	**Low** Large tracts of intact vegetation required to support the specie are not present.	**Unlikely** Species unlikely to occur
Polytelis swainsonii	Superb Parrot	V	V	Found to forage in grassy box woodland up to 10km from the nesting site. They typically nest in colonies and return to the same location over generations. During the summer they return from wintering in northern NSW to breed, often in open box-woodland or isolated paddock trees requiring tree hollows to breed.	Bionet / PMST	**High** Suitable woodland habitat present in the study area. Species known to occur and breed along the Lachlan River	**Unlikely** Limb lopping of a small number of River Red Gum trees overhanging the track is unlikely to reduce the availability of foraging resources to an extent that would detrimentally impact the species. Ample

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
							alternant habitat available in the surrounding study area, and within the Lachlan River riparian corridor
Lathamus discolor	Swift Parrot	E	CE	In NSW, the Swift Parrot mostly occurs mostly on the coast and south west slopes. It breeds in Tasmania and returns to the south-eastern mainland to forage over the cooler months (March – October). They move across the landscape to forage on lerp infestations or an abundance of eucalypt flowers. Preferred feed trees include Eucalyptus robusta, Corymbia maculata, C. gummifera, E. sideroxylon and E. albens.	Bionet / PMST	**Moderate** Species may occur in the region seasonally.. Preferred habitat and feed trees are not present.	**Unlikely** Minor loss of non-preferred habitat unlikely to impact the species
Neophema pulchella	Turquoise Parrot	V	-	Range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Prefers to feed in the shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants, or browsing on vegetable matter. Forages quietly and may be quite tolerant of disturbance. Nests in tree	Bionet	**Moderate** Suitable woodland habitat present in the study area	**Unlikely** Limb lopping of a small number of River Red Gum trees overhanging the track is unlikely to reduce the availability of foraging resources to an extent that would detrimentally impact the species. Ample alternant habitat

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				hollows, logs or posts, from August to December.			available in the surrounding study area, and within the Lachlan River riparian corridor
Daphoenositta chrysoptera	Varied Sitella	V	-	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands, with a nearly continuous distribution in NSW from the coast to the far west.It prefers open Eucalypt and Acacia woodlands with Stringybark Eucalypts from which to glean insects. They are territorial preferring to use the same tree fork to construct nests for breeding.	Bionet	**Moderate** Preferred habitat (stringybark species) not present	**Unlikely** Species unlikely to occur
Hirundapus caudacutus	White-throated Needletail	-	V - Migratory Marine	In eastern Australia, the species is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Dividing Range and occasionally onto the adjacent inland plains. This species is mostly aerial. Although they occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings.	Bionet / PMST	**Moderate** May occur aerially over the site on occasion	**Unlikely** No habitat likely to support the species would be impacted
Fish							

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Macquaria australasica	Macquarie Perch	E	E	This species of freshwater fish inhabits river and lake habitats, especially the upper reaches of rivers and their tributaries. Spawning occurs in spring and summer in shallow upland streams or flowing sections of river systems. This species is found in the upper reaches of the Lachlan, Murrumbidgee and Murray Rivers, and in parts of the Hawkesbury and Shoalhaven catchment areas. The species requires clear water with deep, rocky holes with abundant cover (including aquatic vegetation, woody debris, large boulders and overhanging banks (DotE 2016c; DPI 2016b).	PMST	**Moderate** May occur in aquatic habitat in the Lachlan River nearby	**Unlikely** No aquatic habitat would be impacted by the Proposal
Maccullochella peelii	Murray Cod	-	V	The Murray Cod occurs throughout the Murray-Darling Basin and utilises a diverse range of habitats from clear rocky streams, such as those found in the upper western slopes of NSW, and slow-flowing lowland rivers. Generally, they are found in waters up to 5 m deep and in sheltered areas with cover from rocks, timber or overhanging banks. The presence of wood debris has been shown to be the primary factor determining Murray cod presence.	PMST	**Moderate** May occur in aquatic habitat in the Lachlan River nearby	**Unlikely** No aquatic habitat would be impacted by the Proposal
Maccullochella macquariensis	Trout Cod	E	E	The Trout Cod is endemic to the Murray Darling River system. The closest record occurs from the Macquarie River dating from	PMST	**Moderate** May occur in aquatic habitat in	**Unlikely**

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				2006. This species requires deep water habitat with plenty of cover and refuge including undercut banks, snags (large woody debris) and prefer waterways with relatively fast currents. They typically have small home ranges and remain in the same area.		the Lachlan River nearby	No aquatic habitat would be impacted by the Proposal
Flora							
Androcalva procumbens	-	V	V	Grows in sandy sites, often along roadsides. Recorded in Eucalyptus dealbata and Eucalyptus sideroxylon communities, Melaleuca uncinata scrub, under mallee eucalypts with a Calytrix tetragona understorey, and in a recently burnt Ironbark and Callitris area. Also in Eucalyptus fibrosa subsp. nubila, Eucalyptus dealbata, Eucalyptus albens and Callitris glaucophylla woodlands north of Dubbo. Other associated species include Acacia triptera, Callitris endlicheri, Eucalyptus melliodora, Allocasuarina diminuta, Philotheca salsolifolia, Xanthorrhoea species, Exocarpos cupressiformis, Leptospermum parvifolium and Kunzea parvifolia. Fruiting period is summer to autumn. Flowers from August to December.	PMST	**Low** Site does not contain preferred habitat for the species. Degraded and weedy understory of woodland in the site is unlikely to support the species	**Unlikely** Unlikely to occur

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Austrostipa metatoris	A Spear-grass	V	V	Grows in sandy areas of the Murray Valley; habitats include sandhills, sandridges, undulating plains and flat open mallee country, with red to red-brown clay-loam to sandy-loam soils. Associated species include Eucalyptus populnea, E. intertexta, Callitris glaucophylla, Casuarina cristata, Santalum acuminatum and Dodonaea viscosa. Flowers in response to rain.	PMST	**Low** Site does not contain preferred habitat for the species. Degraded and weedy understory of woodland in the site is unlikely to support the species	**Unlikely** Unlikely to occur
Austrostipa wakoolica	A Spear-grass	E	E	Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise. Associated species include Callitris glaucophylla, Eucalyptus microcarpa, E. populnea, Austrostipa eremophila, A. drummondii, Austrodanthonia eriantha and Einadia nutans. Flowers from October to December, mainly in response to rain.	Bionet / PMST	**Low** Degraded and weedy understory of woodland in the site is unlikely to support the species	**Unlikely** Unlikely to occur
Lepidium aschersonii	Spiny Pepper-cress	V	V	Not widespread, occurring in the marginal central-western slopes and north-western plains regions of NSW (and potentially the south western plains). In the north of the	PMST	**Low** Site does not contain preferred habitat for the	**Unlikely** Unlikely to occur

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				State recent surveys have recorded a number of new sites including Brigalow Nature Reserve, Brigalow State Conservation Area, Leard State Conservation Area and Bobbiwaa State Conservation Area. Also known from the West Wyalong in the south of the State. Records from Barmedman and Temora areas are likely to be no longer present. Approximately 50% of the total Lepidium aschersonii recorded for Australia occurs in NSW. Found on ridges of gilgai clays dominated by Brigalow (Acacia harpophylla), Belah (Casuarina cristata), Buloke (Allocasuarina luehmanii) and Grey Box (Eucalyptus microcarpa). In the south has been recorded growing in Bull Mallee (Eucalyptus behriana). Often the understorey is dominated by introduced plants. The species grows as a a component of the ground flora, in grey loamy clays. Vegetation structure varies from open to dense, with sparse grassy understorey and occasional heavy litter. Flowers from spring to autumn.		species. Degraded and weedy understory of woodland in the site is unlikely to support the species	
Lepidium monoplocoides	Wingged Pepper-cress	E	E	Widespread in the semi-arid western plains regions of NSW. Occurs on seasonally moist to waterlogged sites, on heavy fertile soils, with a mean annual rainfall of around 300-	PMST	**Low** Site does not contain preferred habitat for the	**Unlikely** Unlikely to occur

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				500 mm. Predominant vegetation is usually an open woodland dominated by Allocasuarina luehmannii (Bulloak) and/or eucalypts, particularly Eucalyptus largiflorens (Black Box) or Eucalyptus populnea (Poplar Box). The field layer of the surrounding woodland is dominated by tussock grasses.		species. Degraded and weedy understory of woodland in the site is unlikely to support the species	
Prasophyllum petilum	Tarengo Leek Orchid	E	E	Natural populations are known from a total of five sites in NSW. These are near Boorowa, Queanbeyan area, Ilford, Delegate and a newly recognised population c.10 km west of Muswellbrook. Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Highly susceptible to grazing impacts.	PMST	**Low** Site does not contain preferred habitat for the species. Degraded and weedy understory of woodland in the site is unlikely to support the species	**Unlikely** Unlikely to occur
Prasophyllum sp Wybong	Leek orchid	-	CE	Endemic to NSW, it is known from near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell, Tenterfield, Currabubula and the Pilliga area. Most populations are small, although the Wybong population contains by far the largest number of individuals. Habitat occurs within open eucalypt woodland and grassland.	PMST	**Low** Site does not contain preferred habitat for the species. Degraded and weedy understory of woodland in the site is unlikely to support the species	**Unlikely** Unlikely to occur

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Swainsona recta	Mountain Swainsona Pea	E	E	Small Purple-pea was recorded historically from places such as Carcoar, Culcairn and Wagga Wagga where it is probably now extinct. Populations still exist in the Queanbeyan and Wellington-Mudgee areas. Before European settlement Small Purple-pea occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum Eucalyptus blakelyi, Yellow Box E. melliodora, Candlebark Gum E. rubida and Long-leaf Box E. goniocalyx. Grows in association with understorey dominants that include Kangaroo Grass Themeda australis, poa tussocks Poa spp. and spear-grasses Austrostipa spp.	PMST	**Low** Site does not contain preferred habitat for the species. Degraded and weedy understory of woodland in the site is unlikely to support the species	**Unlikely** Unlikely to occur
Vincetoxicum forsteri	-	V	E	Also known as Tylophora linearis, this species occurs from southern Queensland into central NSW, as far south near Temora with the majority of records occurring in the central western region. Grows in dry scrub and open forest. Recorded from low-altitude sedimentary flats in dry woodlands of Eucalyptus fibrosa, Eucalyptus sideroxylon, Eucalyptus albens, Callitris endlicheri, Callitris glaucophylla and Allocasuarina luehmannii. Also grows in association with Acacia hakeoides, Acacia lineata, Melaleuca uncinata, Myoporum species and Casuarina	PMST	**Low** Site does not contain preferred habitat for the species. Degraded and weedy understory of woodland in the site is unlikely to support the species	**Unlikely** Unlikely to occur

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				species. Flowers in spring, with flowers recorded in November or May and is suspected to be related to rainfall, with fruiting probably 2 to 3 months later. Altitudes are generally in the range of 300 - 400 m a.s.l.			
Mammals							
Nyctophilus corbeni	Corben's Long-eared Bat, South-eastern Long-eared Bat	V	V	Distribution coincides with the Murray Darling Basin, particularly the Pilliga Scrub region. Inhabits a variety of vegetation types, including mallee, buloke (Allocasuarina leuhmannii) and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark. Roosts in tree hollows, crevices, and under loose bark. Slow flying agile bat, utilising the understorey to hunt non-flying prey . Mating takes place in autumn with one or two young born in late spring to early summer.	PMST	**Low** Preferred habitat for this species was not present in the study area. No records for the species in the locality	**Unlikely** No habitat for this species to be impacted, and species unlikely to occur
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	This species roosts in camps generally located within 20 km of a regular food source and are commonly found in gullies, close to water and in vegetation with a	PMST	**Low** Species is transient and typically only travels to western	**Unlikely** Minor impacts of the proposal are unlikely to impact the

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				dense canopy. This species is known to forage in areas supporting subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps on the nectar and pollen of native trees, in particular eucalypts, Melaleucas and Banksias. This species will also forage in urban gardens and cultivated fruit crops. Typically found on the coastal plain and eastern slopes of NSW, only making regular movements to the western slopes in northern NSW.		regions in times of food shortage. No records for the species in the locality	availability of foraging habitat for this highly mobile species
Phascolarctos cinereus	Koala	V	V	The Koala has a fragmented distribution throughout eastern Australia. It is limited to areas of preferred feed trees in eucalypt woodlands and forests. The size of their home range varies depending on the quality of habitat, ranging from less than 2 ha to several hundred ha in size.	PMST	**Low** This species is not known to occur in the locality	**Unlikely** Minor impacts of the proposal are unlikely to impact the availability of foraging habitat for thi species
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	The Large-eared Pied Bat is distributed between south-eastern QLD to NSW from the coast to the western slopes of the divide. This species primarily roosts beneath cliff overhangs, within disused mine shafts and may use tree hollows. Only two maternity roosts are known to occur within NSW. This species requires a combination of sandstone cliff for roosting habitat adjacent to Box-	PMST	**Low** Preferred habitat for this species was not present in the study area. No records for the species in the locality	**Unlikely** No habitat for this species to be impacted, and species unlikely to occur

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				Gum Woodland or riparian corridors to provide appropriate foraging grounds.			
Dasyurus maculatus	Spotted-tailed Quoll	V	E	The Spotted Tailed Quoll inhabits a range of environments in NSW including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Den subject sites are in hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces. Females occupy home ranges of up to 750 ha and males up to 3,500 ha, which are usually traversed along densely vegetated creek lines.	PMST	**Low** No records for the species in the locality, and unlikely to occur as requires large continuous tracts of vegetation to persist in a site	**Unlikely** No habitat for this species to be impacted, and species unlikely to occur
Reptiles							
Aprasia parapulchella	Pink-tailed Worm-lizard	V	V	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (Themeda australis). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites.	PMST	**Low** No suitable habitat (rocky outcrops) for this species in the study area	**Unlikely** Unlikely to occur
Threatened Ecological Communities							

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Grey Box (Eucalyptus macrocarpa) Grassy Woodland and Derived Native Grasslands of South-eastern Australia		E	-	Eucalyptus microcarpa (Inland Grey Box), is often found in association with E.populnea subsp. bimbil (Bimble or Poplar Box), Callitris glaucophylla (White Cypress Pine), Brachychiton populneus (Kurrajong), Allocasuarina luehmannii (Bulloak) or E. melliodora (Yellow Box), and sometimes with E. albens (White Box). Shrubs are typically sparse or absent, although this component can be diverse and may be locally common, especially in drier western portions of the community. A variable ground layer of grass and herbaceous species is present at most sites. At severely disturbed sites the ground layer may be absent.	PMST	**Nil** Community not recorded in the study area	**Unlikely** Does not occur and would not be impacted by the Proposal
Poplar Box Grassy Woodland on Alluvial Plains			E	Poplar Box Grassy Woodland on Alluvial Plains covers native grassy eucalypt woodland where poplar/bimble box is the main tree canopy species present. Other tree species may occasionally occur depending on the characteristics of the site, these include Callitris glaucophylla (white cypress pine), Casuarina cristata (belah), Eucalyptus coolabah (coolibah), Eucalyptus largiflorens (black box), Eucalyptus melanophloia (silver-leaved ironbark),	PMST	**Nil** Community not recorded in the study area	**Unlikely** Does not occur and would not be impacted by the Proposal

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				Eucalyptus microcarpa (inland grey box) and Eucalyptus pilligaensis (narrow-leaved grey box).			
Weeping Myall Woodlands			E	Weeping Myall Woodlands occur in a range of forms from open woodlands to woodlands*, in which weeping myall (Acacia pendula) trees are the sole or dominant overstorey species. Although weeping myall trees are often the only tree species in these woodlands, other trees can occur in the overstorey of the ecological community. This community typically occurs in red-brown earths and heavy textured grey and brown alluvial soils in areas receiving between 375 and 500 mm mean annual rainfall.	PMST	**Nil** Community not recorded in the study area	**Unlikely** Does not occur and would not be impacted by the Proposal
White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland		-	CE	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland can occur as either grassland or woodland is characterised by a species diverse understory of grasses, herbs and sparse shrubs. Dominant canopy species include Eucalyptus albens, E. melliodora and E. blakelyi. This ecological community occurs in areas where rainfall is between 400 and 1200 mm per annum, on moderate to highly fertile soils at altitudes of 170 metres to 1200 metres.	PMST	**Moderate** Community recorded in Study area, however does not occur in the Project site	**Unlikely** Does not occur in the Project site, and would not be impacted by the Proposal

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Migratory Species							
Actitis hypoleucos	Common Sandpiper	-	Migratory Wetland	In Australia, the Common Sandpiper is found in coastal or inland wetlands, both saline or fresh. It is found mainly on muddy edges or rocky shores. When in Australia, the population is concentrated in northern and western Australia .	PMST	**Moderate** Suitable aquatic habitat in the study area and locality	**Unlikely** No impacts to aquatic habitat or habitat likely to support the species
Calidris ferruginea	Curlew Sandpiper	E	CE - Migratory Wetland	Mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. Inland records are probably mainly of birds pausing for a few days during migration.	PMST	**Moderate** Suitable aquatic habitat in the study area and locality	**Unlikely** No impacts to aquatic habitat or habitat likely to support the species
Numenius madagascariensis	Eastern Curlew	-	CE - Migratory Wetland	The Eastern Curlew is found on intertidal mudflats and sandflats, often with beds of seagrass, on sheltered coasts, especially estuaries, mangrove swamps, bays, harbours, lagoons and occasionally on wooden oyster leases or other similar structures. It is rarely found inland. The Eastern Curlew occurs only in our flyway,	PMST	**Moderate** Suitable aquatic habitat in the study area and locality	**Unlikely** No impacts to aquatic habitat or habitat likely to support the species

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				and about 75 per cent of the world's curlews winter in Australia.			
Apus pacificus	Fork-tailed Swift	-	Migratory Marine	Spends most of their time in the air and roosts on cliffs or walls.	PMST	**Moderate** May occur aerially over the site on occasion	**Unlikely** No habitat likely to support the species would be impacted
Gallinago hardwickii	Latham's Snipe	-	Migratory Wetland	Latham's Snipe are seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. They are found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. They also use crops and pasture (DCCEEW 2022).	PMST	**Moderate** Suitable aquatic habitat in the study area and locality	**Unlikely** No impacts to aquatic habitat or habitat likely to support the species
Calidris melanotos	Pectoral Sandpiper	-	Migratory Wetland	These birds forage on grasslands and mudflats, picking up food by sight, sometimes by probing. They mainly eat arthropods and other invertebrates. Some Asian breeders winter in southern Australia and NZ.	PMST	**Moderate** Suitable aquatic habitat in the study area and locality	**Unlikely** No impacts to aquatic habitat or habitat likely to support the species
Myiagra cyanoleuca	Satin Flycatcher	-	Migratory Marine	In NSW widespread on and east of the Great Divide, sparsely scattered on the western slopes, very occasional records on the western plains. Inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, often near wetlands and watercourses. On migration, occur in coastal	PMST	**Low** May occur on occasion to the Subject Site, however unlikely to reside frequently as it is migratory	**Unlikely** No habitat important to the persistence of the species at the site would be impacted

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				forests, woodlands, mangroves and drier woodlands and open forests. Generally, not in rainforests.			
Calidris acuminata	Sharp-tailed Sandpiper	-	Migratory Wetland	The Sharp-tailed Sandpiper prefers the grassy edges of shallow inland freshwater wetlands. It is also found around sewage farms, flooded fields, mudflats, mangroves, rocky shores and beaches. Its breeding habitat in Siberia is the peat-hummock and lichen tundra of the high Arctic.	PMST	**Moderate** Suitable aquatic habitat in the study area and locality	**Unlikely** No impacts to aquatic habitat or habitat likely to support the species
Hirundapus caudacutus	White-throated Needletail	-	V - Migratory Marine	In eastern Australia, the species is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Dividing Range and occasionally onto the adjacent inland plains. This species is mostly aerial. Although they occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings.	Bionet / PMST	**Moderate** May occur aerially over the site on occasion	**Unlikely** No habitat likely to support the species would be impacted
Motacilla flava	Yellow Wagtail	-	Migratory Marine	The Yellow Wagtail is a rare visitor to Australia and may be recorded as a vagrant on occasion.	PMST	**Low** No suitable habitat to support the species present. Does not occur in this region	**Unlikely** Species would not occur

Appendix D – Aboriginal Due Diligence Report

View of Lachlan River adjacent to study area.

ABORIGINAL DUE DILIGENCE ASSESSMENT REPORT

PARKES BBRF ADDITIONAL LACHLAN AQUIFER BORE

FORBES, NSW

FEBRUARY 2023

Report prepared by

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for Parkes Shire Council

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Acknowledgement

OzArk acknowledge the traditional custodians of the area on which this assessment took place and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

EXECUTIVE SUMMARY

OzArk Environment & Heritage (OzArk) has been engaged by Parkes Shire Council (PSC, the proponent) to complete an Aboriginal due diligence heritage assessment for the proposed upgrade to an additional aquifer bore (known as Bore Two) adjacent to the Lachlan River (the proposal). The proposed works are part of the Building Better Regions Fund for Regional NSW and will be assessed under Part 5 of the *Environmental Planning and Assessment Act 1979*.

The study area is located adjacent to the Lachlan River, west of Forbes in central western NSW. It follows an unsealed track which connects to The Escort Way and ends at the site of a bore station approximately 700 metres (m) to the southeast. The study area is shown on **Figure 1-2**.

The visual inspection of the study area was undertaken by OzArk Project Archaeologist Harrison Rochford on 8 December 2022. Rob Clegg, Steve Parker and Jake Trindall representing the Wiradjuri Cultural Heritage Assessments and Management also assisted with the visual inspection. No Aboriginal sites were located within the study area despite the increased archaeological potential identified at desktop level. However, one culturally modified tree was identified outside of the study area and will not be impacted by the proposed works (**Figure 2-3**).

The undertaking of the due diligence process resulted in the conclusion that the proposed works will have an impact on the ground surface, however, no Aboriginal objects or intact archaeological deposits will be harmed by the proposal. This moves the proposal to the following outcome:

> *Aboriginal Heritage Impact Permit application not necessary. Proceed with caution. If any Aboriginal objects are found, stop work, and notify Heritage NSW (02) 9873 8500 (heritagemailbox@environment.nsw.gov.au). If human remains are found, stop work, secure the site, and notify NSW Police and Heritage NSW.*

To ensure the greatest possible protection to the area's Aboriginal cultural heritage values, the following recommendations are made:

1) The proposed work may proceed at the study area without further archaeological investigation under the following conditions:
    a) All land and ground disturbance activities must be confined to within the study area, as this will eliminate the risk of harm to Aboriginal objects in adjacent landforms. Should the parameters of the proposal extend beyond the assessed areas, then further archaeological assessment may be required.
    b) All staff and contractors involved in the proposed work should be made aware of the legislative protection requirements for all Aboriginal sites and objects.
2) This assessment has concluded that there is a low likelihood that the proposed work will adversely harm Aboriginal cultural heritage items or sites. If during works, however,

Aboriginal artefacts or skeletal material are noted, all work should cease and the procedures in the *Unanticipated Finds Protocol* (**Appendix 2**) should be followed.

3) Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts (**Appendix 3**) and are aware of the legislative protection of Aboriginal objects under the National Parks & Wildlife Act 1974 and the contents of the *Unanticipated Finds Protocol.*

4) The information presented here meets the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*. It should be retained as shelf documentation for five years as it may be used to support a defence against prosecution in the event of unanticipated harm to Aboriginal objects.

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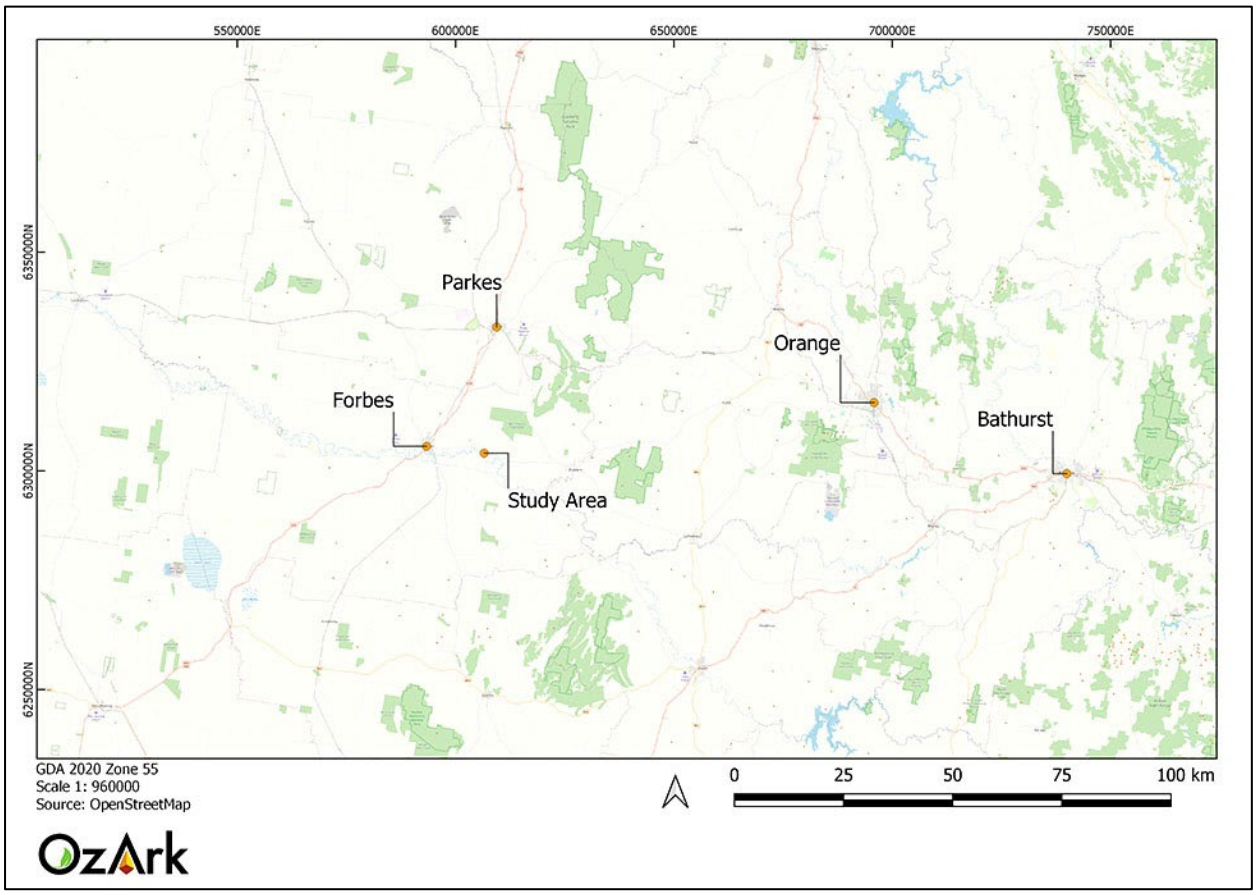
1 INTRODUCTION

1.1 BRIEF DESCRIPTION OF THE PROPOSAL

OzArk Environment & Heritage (OzArk) has been engaged by Parkes Shire Council (PSC, the proponent) to complete an Aboriginal due diligence heritage assessment for the proposed upgrade to an additional aquifer bore adjacent to the Lachlan River (the proposal) (**Figure 1-1**).

Figure 1-1. Map showing the location of the proposal.



1.2 STUDY AREA

The study area is located adjacent to the Lachlan River west of Forbes in central western NSW. It follows an unsealed track approximately 10 metres (m) wide, which connects to The Escort Way and ends at the site of a bore platform approximately 700 m to the southeast. The study area is shown on **Figure 1-2**. The study area is approximately 12 kilometres (km) southeast of Forbes, NSW.

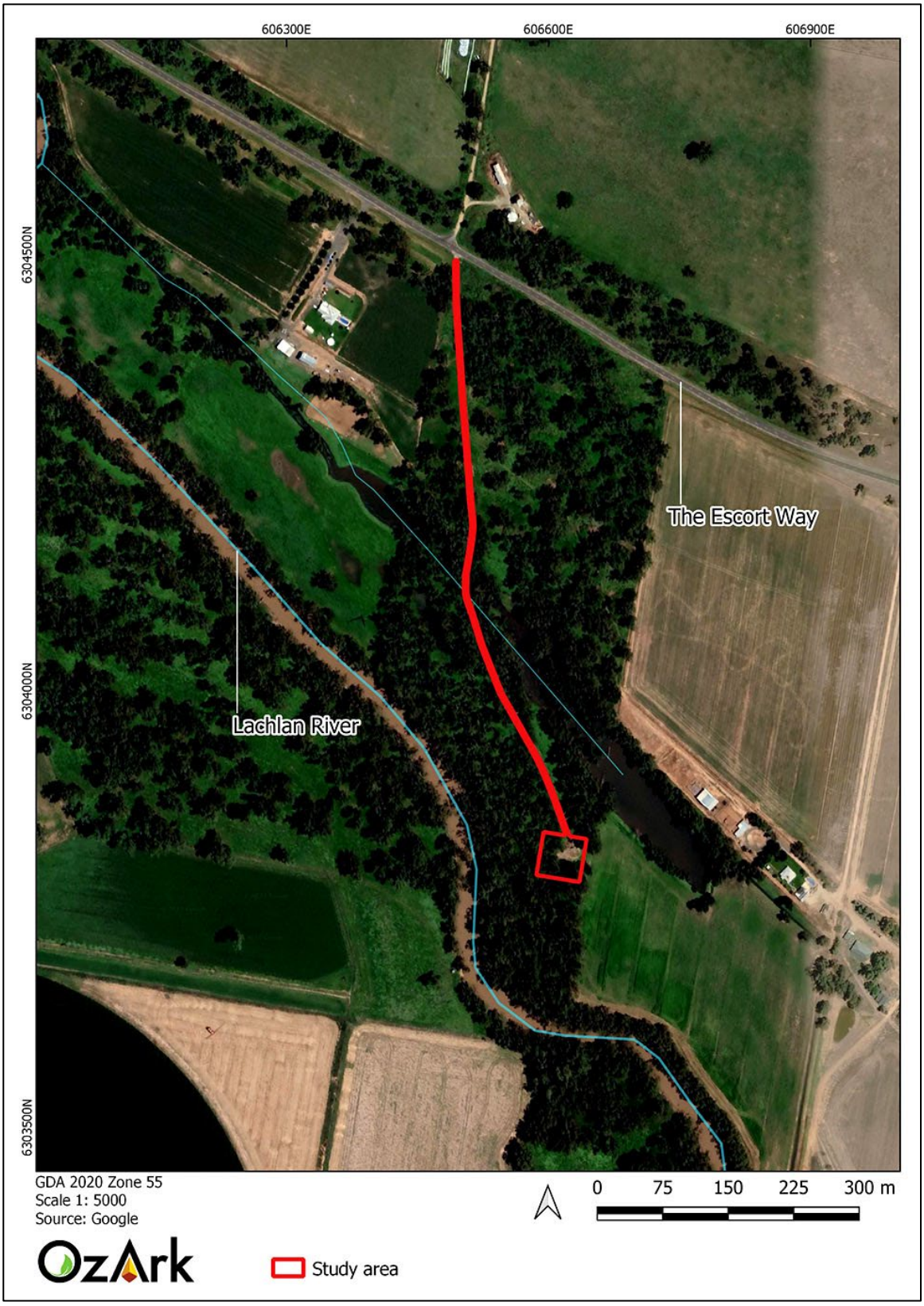
1.3 ASSESSMENT APPROACH

Aboriginal cultural heritage

The desktop and visual inspection component for the study area follows the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (due diligence; DECCW

2010). The field inspection followed the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011).

Figure 1-2: Aerial showing the study area.



2 ABORIGINAL DUE DILIGENCE ASSESSMENT

2.1 INTRODUCTION

Section 57 of the National Parks and Wildlife Regulation 2019 (NPW Regulation) made under the *National Parks and Wildlife Act 1974* (NPW Act) advocates a due diligence process to determining likely impacts on Aboriginal objects. Carrying out due diligence provides a defence to the offence of harming Aboriginal objects and is an important step in satisfying Aboriginal heritage obligations in NSW.

2.2 DEFENCES UNDER THE NPW REGULATION 2019

2.2.1 Low impact activities

The first step before application of the due diligence process itself is to determine whether the proposed activity is a "low impact activity" for which there is a defence in the NPW Regulation. The exemptions are listed in Section 58 of the NPW Regulation (DECCW 2010: 6).

The activities of PSC are not considered a 'low impact activity' as they will impact the ground surface and the due diligence process must be applied.

2.2.2 Disturbed lands

Relevant to this process is the assessed levels of previous land-use disturbance.

The NPW Regulation Section 58 (DECCW 2010: 18) define disturbed land as follows:

> *Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable.*
>
> *Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks.*

Sections of the study area have been previously disturbed due to the construction and maintenance of the access track leading to the bore as well as existing bore infrastructure. These disturbances include track grading, land clearing and minor earthworks. However, apart from the previously mentioned disturbances, some sections of the proposed work are not in an area where the land's surface has been changed in a clear and observable manner and the due diligence process must be applied.

In summary, it is determined that the proposal must be assessed under the Due Diligence Code of Practice. The reasoning for this determination is set out in **Table 2-1**.

Table 2-1: Determination of whether Due Diligence Code of Practice applies.

Item	Reasoning	Answer
Is the activity to be assessed under Division 4.7 (state significant development) or Division 5.2 (state significant infrastructure) of the EP&A Act?	The proposal will be assessed under Part 5 of the EP&A Act.	No
Is the activity exempt from the NPW Act or NPW Regulation?	The proposal is not exempt under this Act or Regulation.	No
Do either or both apply: Is the activity in an Aboriginal place? Have previous investigations that meet the requirements of this Code identified Aboriginal objects?	The activity will not occur in an Aboriginal place. No previous investigations have been undertaken for this proposal.	No
Is the activity a low impact one for which there is a defence in the NPW Regulation?	The proposal is not a low impact activity for which there is a defence in the NPW Regulation.	No
Is the activity occurring entirely within areas that are assessed as 'disturbed lands'?	The proposal is not entirely within areas of high modification.	No
Due Diligence Code of Practice assessment is required		

2.3 APPLICATION OF THE DUE DILIGENCE CODE OF PRACTICE TO THE PROPOSAL

To follow the generic due diligence process, a series of steps in a question/answer flowchart format (DECCW 2010: 10) are applied to the proposed impacts and the study area, and the responses documented.

2.3.1 Step 1

Will the activity disturb the ground surface or any culturally modified trees?

Yes, the proposal will impact the ground surface and may impact culturally modified trees.

PSC propose to upgrade the existing unsealed track which leads to the bore and its associated infrastructure. Machinery may be used to to complete track grading and impact the ground surface through minor earthworks.

As mature native vegetation exists within the study area it is possible that culturally modified trees may be present and could be affected by the proposed works. However, it is unlikely that clearing will be required for the proposed works.

2.3.2 Step 2a

Are there any relevant confirmed site records or other associated landscape feature information on AHIMS?

No, there are no previously recorded sites within the study area.

A search of the Aboriginal Heritage Information Management System (AHIMS) on 15 September 2022 was undertaken over a 10 x 10 km search area (GDA Zone 55 Eastings: 601000–611000, Northings 6299400–6309400). The search returned seven previously recorded Aboriginal sites within the search area; however, none are within the study area. **Figure 2-1** shows all previously recorded sites in relation to the study area and **Table 2-2** shows the types of sites that are close to the study area.

Table 2-2: Site types and frequencies of AHIMS sites near the study area.

Site Type	Number	% Frequency
Modified tree (scarred or carved)	**6**	**86**
Artefact scatter & PAD	**1**	**14**
Total	**7**	**100**

Figure 2-1:AHIMS results in relation to the study area.

Culturally modified trees were found to be the most common Aboriginal site type by the AHIMS search (86% n=6). One artefact scatter & PAD (14%) was also located. This data suggests that modified trees may be present within the study area as mature native vegetation is present.

Artefact scatters and areas of PAD may also be present within the study area as the previous artefact scatter located by the AHIMS search is located approximately 700 meters (m) northwest on a similar flat floodplain landform adjacent to the Lachlan River as the current study area.

2.3.3 Step 2b

Are there any other sources of information of which a person is already aware?

No, there are no other sources of information that would indicate the presence of Aboriginal objects in the study area.

2.3.3.1 Ethnohistoric context

The proposal is located in the centre of Wiradjuri country (Tindale 1974). The Wiradjuri tribal area extends as far north as Gilgandra, as far east as Lithgow and as far west as Hay. It is the largest tribal and linguistic group in NSW by land size and incorporates a large section of the central tablelands and central west regions of NSW (Horton 1996).

The ethnographic information recorded by colonial explorers in the region, such as Oxley and Cunningham in the early 1800s, indicates that Wiradjuri people near the Lachlan River lived in both small groups and some larger groups that comprised of up to 120 individuals. Wiradjuri people and hunted local species of kangaroo, emu, and possum as a source of food. Fishing was also utilised to sustain the population with both mussels and freshwater fish being caught by women who used moveable dams made of grasses to direct fish, making them easier to catch (Kass 2003:6).

2.3.3.2 Regional Archaeological context

OzArk 2016

A 2016 study analysing site distribution across the central west region of NSW concluded that Aboriginal sites are more likely to be found in Channel and Floodplain landscapes (OzArk 2016). Scarred trees were found to be the most common site type within these landscapes.

Sloping landscapes were also found to contain a relatively large number of Aboriginal sites with artefacts scatters most commonly associated with this type of landscape.

The report also found a strong correlation between site location and proximity to water.

The study area is situated on the Lachlan-Bland Channels and Floodplains landscape unit (Mitchell 2002), which was categorised as a Channel and Floodplain type in the study. As the results of the OzArk study indicate that Channel and Floodplain landscapes have the highest correlation with Aboriginal site identification, this suggest an increased likelihood for sites to be present within the study area.

2.3.3.3 Local archaeological context

Ecological 2022

As part of the Parkes Town Water Security Program, Ecological assessed a 9 km pipeline easement north of the current study area. As part of this assessment, a test excavation program was completed by OnSite CHM and Wiradjuri site officers led by Rob Clegg.

A total of 24 (50 x 50 cm) test pits were excavated at 20 m intervals along the proposed alignment parallel to the Lachlan River in late 2021. The test pit excavations did not record any Aboriginal artefacts (Ecological 2022: 20).

Implications for the study area

The ethnohistoric context of the site suggests Wiradjuri people left evidence of their use of the land though scarred trees and artefact scatters. The Lachlan River is known to have been a crucial resource and feature of the cultural landscape indicating an increased likelihood for Aboriginal sites to exist nearby. The study area has not been previously assessed and information detailed in **Section 2.3.2** presents the only available information that specifically relates to the study area: an AHIMS search. There are no known cultural values or Aboriginal sites pertaining directly to the study area.

2.3.4 Step 2c

Are there any landscape features that are likely to indicate presence of Aboriginal objects?

Yes, portions of the study area contain landforms with identified archaeological sensitivity.

The study area is situated on a flat floodplain landform adjacent to the Lachlan River within the Lachlan Bland Channels and Floodplains landscape unit (Mitchell 2002: 92). This landscape typically consists of swamps, levees and minor tributary streams and waterways. One such waterway intersects the study area at the approximate mid-point of the access track causing almost the entire study area to be located within 200 m of 'waters,' increasing the archaeological potential of the study area (DECCW 2010).

Soils include red-brown sand and loamy-sands as well as more structured texture-contrast soils located further from stream banks. Vegetation consists of river red gum and river cooba along creeks as well as a variety of box trees. Reeds and cane grasses are also common on lake floor and large swamps (Mitchell 2002: 92). The entire site is located on a floodplain landform and consists of few minor elevation changes.

Due to the proximity of the study area to a major named waterway as well as smaller tributary creek lines, the potential for Aboriginal sites is increased. The flat nature of the floodplain landform in which the study area is located also increased the likelihood of archaeological material existing

within the study area. Mature native vegetation present also increased the likelihood that culturally modified trees may be present. Overall, the archaeological potential of the study area at a desktop level is high.

2.3.5 Step 3

Can harm to Aboriginal objects or disturbance of archaeologically sensitive landscape features be avoided?

No. Landforms with identified archaeological sensitivity may be impacted by the proposal.

The proposed upgrade works must occur on the existing access track which is located on an archaeologically sensitive landform and cannot be avoided. Therefore, potential for archaeologically sensitive landforms to be impacted remains.

2.3.6 Step 4

Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely?

No, Aboriginal objects are not present within the study area and will not be harmed by the proposal.

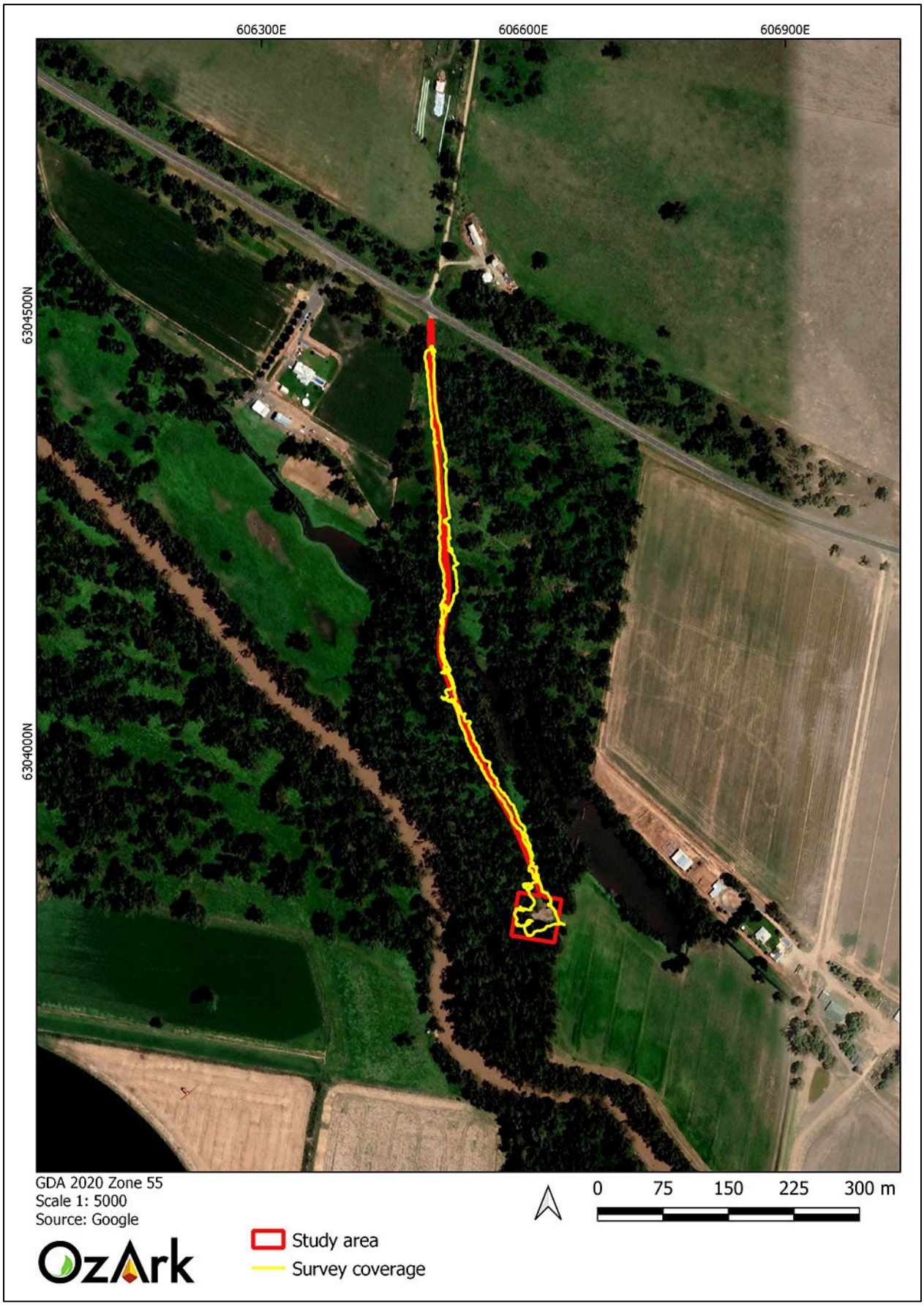
The visual inspection of the study area was undertaken by OzArk Project Archaeologist, Harrison Rochford on 8 December 2022. Rob Clegg, Steve Parker and Jake Trindall representing Wiradjuri Cultural Heritage Assessments and Management assisted with the visual inspection.

The ground surface exposure (GSE) during the visual inspection was low (5-10%) due to naturally occurring ground cover (**Plate 1**). However, on the existing access track GSE was higher (40-50%). Within in these exposures, ground surface visibility (GSV) ranged from 70-100% (**Plate 2**).

Disturbances identified at a desktop level were confirmed by the visual inspection team including minor land clearing, track grading and fence construction (**Plate 3**).

Recent flooding had caused debris to become tangled in electrical infrastructure associated with the bore location (**Plate 4**), however this did not significantly impact the visual inspection. No other factors impeded the work, and all areas of the study area were adequately surveyed.

Figure 2-2: Survey coverage within the study area.



Discussion

No Aboriginal sites were located within the study area despite the increased archaeological potential identified at desktop level.

Although mature native vegetation is present, no culturally modified trees were recorded within the study area, despite AHIMS data suggesting they could exist where mature native vegetation was present. However, one culturally modified tree was located over 10 m west of the study area and will therefore not be impacted by the proposed works (**Figure 2-3**). After review, all members of the visual inspection team agreed that the site did not require management (such as fencing) and did not meet the criteria to be officially registered in the online AHIMS database (**Plate 5**).

The flat floodplain landform identified at desktop level was impacted by disturbances associated with the construction of the access track and bore infrastructure which ultimately decreased its archaeological potential once the study area was visual inspected. As a result of these factors, it was concluded that the overall archaeological potential of the study area was lower than first thought.

A 'no' answer for Step 4, results in the following outcome (DECCW 2010):

> *AHIP* (Aboriginal Heritage Impact Permit) *application not necessary. Proceed with caution. If any Aboriginal objects are found, stop work and notify Heritage NSW (02) 9873 8500 (heritagemailbox@environment.nsw.gov.au). If human remains are found, stop work, secure the site and notify NSW Police and Heritage NSW.*

Figure 2-3: Possible scarred tree in relation to the study area.

2.4 CONCLUSION

The due diligence process has resulted in the outcome that an Aboriginal Heritage Impact Permit (AHIP) is not required. The reasoning behind this determination is set out in **Table 2-3**.

Table 2-3: Due Diligence Code of Practice application.

Step	Reasoning	Answer
Step 1 Will the activity disturb the ground surface or any culturally modified trees?	The proposed works will disturb the ground surface through the use of machinery to complete upgrade works to the bore site and access track. The proposal may impact mature, native vegetation and therefore has the potential to harm culturally modified trees.	Yes
If the answer to Step 1 is 'yes', proceed to Step 2		
Step 2a Are there any relevant records of Aboriginal heritage on AHIMS to indicate presence of Aboriginal objects?	AHIMS indicated that there are no Aboriginal sites within the study area. One culturally modified tree has been recorded approximately 10 m outside the study area and will not be harmed by the proposal.	No
Step 2b Are there other sources of information to indicate presence of Aboriginal objects?	There are no other sources of information to indicate that Aboriginal objects are likely in the study area, although it is noted that there is a general likelihood for landforms in the region to contain Aboriginal objects.	No
Step 2c Will the activity impact landforms with archaeological sensitivity as defined by the Due Diligence Code?	Landforms with identified archaeological sensitivity are present as the bore and access track are both within 200 m of 'waters'.	Yes
If the answer to any stage of Step 2 is 'yes', proceed to Step 3		
Step 3 Can harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out of the activity at the relevant landscape features be avoided?	The proposal will impact landforms with archaeological sensitivity as identified in the Due Diligence Code: landforms within 200 m of 'waters'.	No
If the answer to Step 3 is 'no', a visual inspection is required. Proceed to Step 4.		
Step 4 Does the visual inspection confirm that there are Aboriginal objects or that they are likely?	The visual inspection recorded no Aboriginal objects in the study area. Landforms with identified archaeological sensitivity that were identified at a desk-top level were found during the inspection to have low archaeological potential.	No
Conclusion		
AHIP not necessary. Proceed with caution.		

3 MANAGEMENT RECOMMENDATIONS

The undertaking of the due diligence process resulted in the conclusion that the proposed works will have an impact on the ground surface, however, no Aboriginal objects or intact archaeological deposits will be harmed by the proposal. This moves the proposal to the following outcome:

> *Aboriginal Heritage Impact Permit application not necessary. Proceed with caution. If any Aboriginal objects are found, stop work, and notify Heritage NSW (02) 9873 8500 (heritagemailbox@environment.nsw.gov.au). If human remains are found, stop work, secure the site, and notify NSW Police and Heritage NSW.*

To ensure the greatest possible protection to the area's Aboriginal cultural heritage values, the following recommendations are made:

1) The proposed work may proceed at the study area without further archaeological investigation under the following conditions:

    c) All land and ground disturbance activities must be confined to within the study area, as this will eliminate the risk of harm to Aboriginal objects in adjacent landforms. Should the parameters of the proposal extend beyond the assessed areas, then further archaeological assessment may be required.

    d) All staff and contractors involved in the proposed work should be made aware of the legislative protection requirements for all Aboriginal sites and objects.

2) This assessment has concluded that there is a low likelihood that the proposed work will adversely harm Aboriginal cultural heritage items or sites. If during works, however, Aboriginal artefacts or skeletal material are noted, all work should cease and the procedures in the *Unanticipated Finds Protocol* (**Appendix 2**) should be followed.

3) Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts (**Appendix 3**) and are aware of the legislative protection of Aboriginal objects under the National Parks & Wildlife Act 1974 and the contents of the *Unanticipated Finds Protocol.*

4) The information presented here meets the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*. It should be retained as shelf documentation for five years as it may be used to support a defence against prosecution in the event of unanticipated harm to Aboriginal objects.

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PLATES

Plate 1: View of reduced GSE due to ground cover.

Plate 2: View south along existing access track with increased GSE and GSV.

Plate 3: View of fallen fence due to flood damage adjacent to existing ploughed field.

Plate 4: Flood debris entangled in electrical infrastructure at existing bore location.

Plate 5: Possible scarred tree located outside of study area.

	
View of scarred tree located outside of study area.	View showing scarred tree extending to ground level.
	
View of upper shape of scar.	View of scarred tree with surrounding ground cover.

APPENDIX 1: AHIMS SEARCH RESULTS

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Forbes study site
Client Service ID : 718080

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
43-3-0108	Lachlan River PSC Pump OS1 PAD	GDA	55	605849	6304754	Open site	Partially Destroyed	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Ms.Morgan Wilcox					Permits	3844	
43-3-0107	Forbes North2	GDA	55	602023	6300801	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Larry Towney,Central Tablelands Local Land Services - Orange					Permits		
43-3-0196	LVST2	GDA	55	603672	6300522	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Eco Logical Australia Pty Ltd - Sydney - Individual users,Mr.Declan Coman					Permits		
43-3-0197	LVST1	GDA	55	604203	6300408	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Eco Logical Australia Pty Ltd - Sydney - Individual users,Mr.Declan Coman					Permits		
43-3-0198	LVST3	GDA	55	603533	6300571	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Eco Logical Australia Pty Ltd - Sydney - Individual users,Mr.Declan Coman					Permits		
43-3-0199	LVST4	GDA	55	602815	6300674	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Eco Logical Australia Pty Ltd - Sydney - Individual users,Mr.Declan Coman					Permits		
43-3-0200	LVST5	GDA	55	602339	6300762	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Eco Logical Australia Pty Ltd - Sydney - Individual users,Mr.Declan Coman					Permits		

** Site Status
Valid - The site has been recorded and accepted onto the system as valid
Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.
Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground
Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 15/09/2022 for Jodie Benton for the following area at Datum :GDA, Zone : 55, Eastings : 601000.0 - 611000.0, Northings : 6299400.0 - 6309400.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 7

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

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APPENDIX 2: ABORIGINAL HERITAGE: UNANTICIPATED FINDS PROTOCOL

An Aboriginal artefact is anything which is the result of past Aboriginal activity. This includes stone (artefacts, rock engravings etc.), plant (culturally scarred trees) and animal (if showing signs of modification; i.e. smoothing, use). Human bone (skeletal) remains may also be uncovered while onsite.

Cultural heritage significance is assessed by the Aboriginal community and is typically based on traditional and contemporary lore, spiritual values, and oral history, and may also consider scientific and educational value.

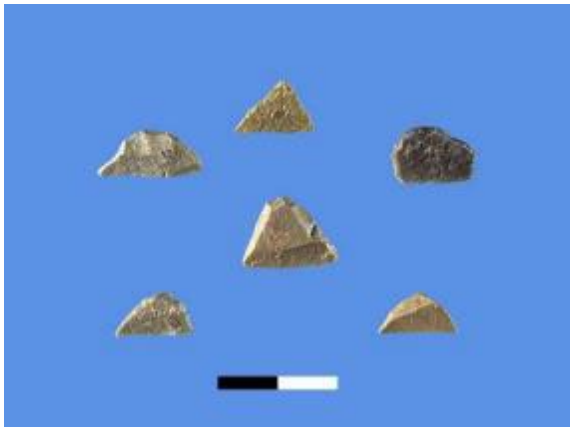
Protocol to be followed if previously unrecorded or unanticipated Aboriginal object(s) are encountered:

1. If any Aboriginal object is discovered and/or harmed in, or under the land, while undertaking the proposed development activities, the proponent must:
    a. Not further harm the object
    b. Immediately cease all work at the particular location
    c. Secure the area to avoid further harm to the Aboriginal object
    d. Notify Heritage NSW as soon as practical on (02) 9873 8500 (heritagemailbox@environment.nsw.gov.au), providing any details of the Aboriginal object and its location; and
    e. Not recommence any work at the particular location unless authorised in writing by Heritage NSW.
2. If Aboriginal burials are unexpectedly encountered during the activity, work must stop immediately, the area secured to prevent unauthorised access and NSW Police and Heritage NSW contacted.
3. Cooperate with the appropriate authorities and relevant Aboriginal community representatives to facilitate:
    a. The recording and assessment of the find(s)
    b. The fulfilment of any legal constraints arising from the find(s), including complying with Heritage NSW directions
    c. The development and implementation of appropriate management strategies, including consultation with stakeholders and the assessment of the significance of the find(s).
4. Where the find(s) are determined to be Aboriginal object(s), recommencement of work in the area of the find(s) can only occur in accordance with any consequential legal requirements and after gaining written approval from Heritage NSW (normally an Aboriginal Heritage Impact Permit).

APPENDIX 3: ABORIGINAL HERITAGE: ARTEFACT IDENTIFICATION

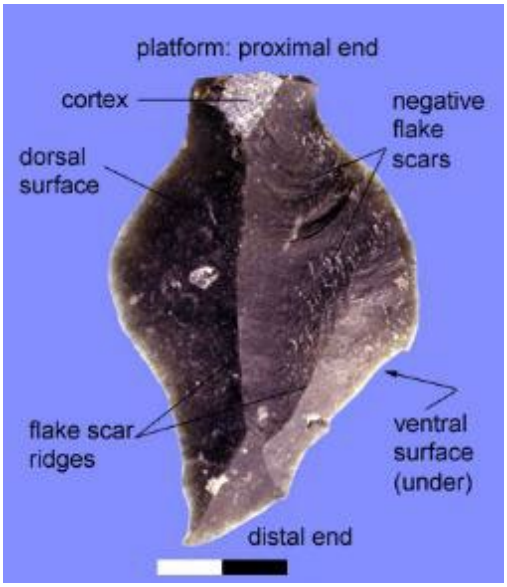
A retouched silcrete flake

A quartz flake



Microliths (scale = 1 cm)

Volcanic flakes



Flake characteristics (scale = 1 cm)

A mudstone/tuff core from which flakes have been removed

Appendix E – Summary of Safeguards

The following Environmental Safeguards for Soils and Erosion, Waterways, Noise and Vibration, Air Quality, Aboriginal and Non-Aboriginal Heritage, Biodiversity, Traffic and Transport, Socio-economic Considerations, Waste, Visual Amenity and Climate Change are considered part of the Proposal and must be implemented and maintained. Impacts associated with the Proposal will not be significant if the below-mentioned Safeguards are implemented and maintained throughout construction and operational phases of the Proposal.

Environmental Section	Impact	Mitigation measures	Responsibility and timing
Soils and erosion	Soils and erosion - Vegetation removal	• No vegetation outside the approved direct impact footprint is to be impacted or removed; vegetation that is not approved for clearance is to be protected to ensure soils are not exposed unnecessarily. • All areas where groundcovers/vegetation are required to be removed will require careful management during construction due to the higher erosion risks,	Council and Project/Construction Manager Pre-construction Construction
	Soils and erosion - ERSED controls	• Erosion and sediment (ERSED) control measures are to be implemented and maintained throughout construction to: ▪ prevent sediment moving off-site and sediment laden water entering any drainage lines, drain inlets, or dams; and ▪ reduce water velocity and capture sediment on site. ○ ERSED controls are to be installed prior to the commencement of works and checked and maintained on a regular basis (including clearing of sediment from behind barriers). ○ ERSED control measures are not to be removed until the works are complete, and areas are stabilised. • Monitoring and response actions with regards to ERSED controls will be incorporated within the Construction Environmental Management Plan (CEMP) for the Project, to be enforced by the appointed Contractor. • Sediment fences/strawbale filters or equivalent should be installed wherever water is predicted to enter/exit the works area.	Council and Project/Construction Manager Pre-construction Construction
	Soil and erosion - General	• The drill pad and any other excavated areas are to be stabilised as soon as possible using the most appropriate combination of the following measures: ○ Hydromulching with appropriate native grass mixture and/or groundcover species;	Council and Project/Construction Manager Pre-construction

Environmental Section	Impact	Mitigation measures	Responsibility and timing
		○ Turfing with appropriate native grass mixture and/or groundcover species; ○ Seeding with appropriate native grass mixture and/or groundcover species; and/or ○ Revegetation using appropriate native tubestock or mature seedlings. • The maintenance of established stockpile sites during construction is to be in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book) (Landcom 2004). • Stockpiles are recommended to be formed in accordance with the Blue Book Standard Drawing 4-1, and offsite/away from waterbodies where possible. • Topsoil and subsoil are to be separated and protected from degradation, erosion or mixing with fill or waste. Materials are to be reused onsite where appropriate for infilling works, including re-spreading of topsoil as appropriate to enable rapid rehabilitation. Where onsite reuse cannot be accommodated, soil materials should be put to beneficial reuse elsewhere.	Construction Post-construction
	Soil and erosion – Soil contamination	• If contaminated soils are encountered during construction, a site assessment is to be completed in accordance with Schedule A 'Recommended general process for assessment of site contamination' (NEPM 1999). • If contaminated soils are encountered, they will be managed (and if necessary excavated, contained, treated and disposed of) in accordance with the law and relevant EPA and Council guidance. • All chemical usage and storage during construction is to be in line with legislated requirements, to prevent Pollution of Land, which is prohibited under Section 142 A of the POEO Act.	Council and Project/Construction Manager Construction

Environmental Section	Impact	Mitigation measures	Responsibility and timing
	Soil and Erosion Operational	• Monitoring of the site is to be undertaken to ensure ERSED controls remain in place until the site is re-stabilised, and to ensure no sediment is washed into any waterways following construction and before revegetation efforts are completed. • Maintenance of vegetative cover on all exposed surfaces (not to be covered by road base/seal) to be undertaken to ensure the stability of soils on site into the future. • Infill planting or additional spreading of appropriate native grass mixture and/or groundcover species to be undertaken until the entire site is stabilised.	Council and Project/Construction Manager Pre-construction Construction
Surface and groundwater	Surface and groundwater - General	• If 'dirty' site water is collected from within the direct impact footprint, it is to be redirected to filtration devices to trap sediments and other pollutants, and dissipate flow velocities, prior to discharging to the surrounding environment. Drainage and runoff should be controlled in such a way that no foreign substrates or materials leave the site. • 'Clean' water from outside the study area is to be diverted around the site, to avoid contamination and to prevent scour/erosion of the site during rainfall events during construction. • Works to be completed in dry times (i.e. times of no current or predicted rainfall).	Council and Project/Construction Manager Construction
	Surface and groundwater - Contamination	• Appropriate sediment and erosion controls are to be installed and maintained during construction, to ensure sediment and pollutant laden surface water runoff does not enter adjacent waterways/drainage lines. • Any water intersected or used during the drilling procedure is intersected is to be captured in an appropriately lined sump and disposed of appropriately off site.	Council and Project/Construction Manager Pre-construction Construction

Environmental Section	Impact	Mitigation measures	Responsibility and timing
		• All litter, including cigarette butts and food wrappers, is to be collected in a suitable receptacle and disposed of appropriately throughout the construction phase to ensure these do not end up polluting waters. • Re-fuelling of plant and equipment is to occur offsite, or in impervious bunded areas located a minimum of 40 metres from drains, drainage lines or dams. • Vehicle wash-down and/or cement truck washout (if required) is to occur offsite unless it forms part of sediment control, where it is to occur in a suitably bunded area with controlled run-off. • Monitoring of water quality is to be undertaken within culverts during and immediately following rainfall events, to identify if ERSED controls are functioning as intended. Visual inspections should be undertaken by an appropriately qualified person/s to determine if water is turbid, or if there is evidence of petrochemicals or other pollutants present as a consequence of construction activities. • Segregate and stockpile topsoil removed from the area a minimum of 40 m from any waterway and on a flat, stable area. Use measures such as silt fences and holding ponds to prevent stockpile runoff from entering waterways. • Minimize the length of time that soils are exposed by stabilising as soon as practical by seeding, spreading mulch or installing erosion control blanket as appropriate. • Biosecurity and water health protection measures should be implemented throughout the construction phase, including: ○ Machinery should arrive on site in a clean, washed condition, free of fluid leaks, pests and/or weeds/spores;	

Environmental Section	Impact	Mitigation measures	Responsibility and timing
		○ Regular weed control should be undertaken in disturbed areas throughout the construction period to prevent weed spread into waterways, if notifiable/listed weed material is present (unlikely); and ○ Ensure all pesticide/herbicides used are registered for use within a waterway, as per NSW DPI guidelines. Alternatively, opt to remove weeds mechanically where possible. • Spill response protocols for plant, equipment and chemicals used or stored on site during construction are to be available and accessible at all times to prevent and minimise potential for Pollution of Waters (s120 POEO Act). • A Soil and Water Management Plan will be developed as part of the CEMP for the Proposal, detailing: ○ Water quality parameters ○ Appropriate monitoring locations and frequency ○ Location and types of ERSED controls ○ Proposed revegetation and stabilisation measures to be undertaken •	
	Surface and groundwater - Operational	• Ensure the amount of water extracted annually from the bore does not exceed the rate of 10L/second and the total amount for the bore does not exceed 1,100ML/year. • Continue to undertake a water quality and quantity monitoring program in line with Council's requirements until all sites are completely stabilised; monitoring should include details of proposed baseline and downstream/dam water quality following any heavy rainfall. • Subject site rehabilitation, including removal of weeds and revegetation using appropriate native species, to be undertaken to ensure soil stability and	Council and Project/Construction Manager Post-construction

Environmental Section	Impact	Mitigation measures	Responsibility and timing
		prevention of sediment runoff from the site into the future. Revegetation must be maintained with a survival rate of >80%. • Monitor access roads following heavy rains and ensure engineering safeguards to prevent erosion and movement of surface sediment are functioning correctly. •	
Noise and vibration	Noise and vibration – Working hours	• Noise emissions should be considered in terms of the Interim Construction Noise Guideline (ICNG) (Department of Energy and Climate Change (DECC) 2009). • Noise impacts to the local community will be limited to recommended standard working hours as detailed in the Interim Construction Noise Guideline 2009 (ICNG). All activities and project works, including the arrival and departure of vehicles delivering or removing materials to or from the site, shall be carried out between the hours of: 7:00am to 6:00pm Monday to Friday, 8:00am to 1:00pm Saturdays, and No work Sunday and Public Holidays • The appointed contractor will incorporate Noise and Vibration Management strategies in the CEMP, and suitably induct all staff operating machinery on the site to ensure the standard working hours are adhered to, and that machinery movement (revving, reverse beepers) is kept to a minimum. This management plan must include the general noise and vibration management practices (AS 2436-2010).	Council and Project/Construction Manager Pre-construction Construction
	Noise and vibration – Sensitive receivers and complaints	• Nearby residents that have the potential to be impacted as part of works should be notified of the proposed construction no less than two (2) weeks prior to works commencing.	Council and Project/Construction Manager

Environmental Section	Impact	Mitigation measures	Responsibility and timing
		• Communication of intentions and timeframes to neighbouring properties will minimise misconceptions, uncertainty and negative reactions to noise. The site supervisor should supply a contact number to aid in community liaison. • All complaints are to be handled in a timely manner.	Pre-construction Construction
	Noise and vibration - General	• Plant deliveries and site access will occur quietly and efficiently, with parking allowed only within designated areas located away from nearby sensitive receivers. • Simultaneous operation of high-level noise generating machinery should be avoided by operating at contrasting times or increasing the distance between the plant and the nearest identified receiver. • High noise generating activities, such as jack hammering, should be carried out in continuous blocks, not exceeding 3 hours with a minimum respite period between blocks of one hour. • Low-pitch tonal beepers should be installed where possible and reversing minimised on site. • All engine covers are to be closed and machines that are not in use, shut down. • Where possible, high noise generating activities such as loading and unloading and material dumps should be located as far as possible from the nearest receptors. • Works should be timed to avoid prime breeding season (Spring) for the majority of native species residing in the area.	Council and Project/Construction Manager Pre-construction Construction

Environmental Section	Impact	Mitigation measures	Responsibility and timing
Air Quality	Air quality - General	• Council must undertake community engagement and liaison, to set expectations for the works schedule and likely impacts arising as part of the works, particularly prior to works commencing. • Daily visual construction dust monitoring should occur, with works to cease if dust plumes are occurring that have potential to impact areas outside the direct impact footprint. • Speed limits on access tracks and across the site during dry weather to keep dust to a minimum. • Provide an adequate water supply on the construction site for effective dust/particulate matter suppression/mitigation. If synthetic dust suppressants are used, they must be biodegradable in nature and non-toxic for waterways. • Earthworks and exposed areas/soil stockpiles are to be revegetated using appropriate native/crop species to stabilise surfaces as soon as practicable. • Only vegetation that has been approved for removal may be removed or otherwise impacted; intact vegetation stabilises soils and keeps dust to a minimum. • Vegetation and other materials are not to be burnt on site, unless the vegetation material is a weed that prohibits transportation and disposal by other means. • Vehicles transporting waste or other materials that may produce odours or dust are to be covered during transit. • Tracking of machinery carrying soil/spoil through Forbes or Parkes township is to be avoided where possible. • Stockpiles or areas that may generate dust are to be managed to suppress dust emissions.	Council and Project/Construction Manager Pre-construction Construction

Environmental Section	Impact	Mitigation measures	Responsibility and timing
		• Dampening of exposed soils will be undertaken during weather conditions conducive to visible dust formation. • Construction plant and equipment will be maintained in a good working condition in order to limit impacts on air quality through vehicle emissions. • Fuel operated plant and equipment will not be left idle when not in use.	
	Air quality – Monitoring and complaints	• Regular site inspections will be undertaken as part of air quality monitoring, and inspection results recorded by Council's Principal Contractor. • Any dust complaints received during construction will be duly investigated in accordance with Council's requirements under the POEO Act. • Any exceptional incidents that cause dust and/or air emissions, either on or off site, will be recorded, and the action taken to resolve the situation recorded in the logbook.	Council and Project/Construction Manager Construction
	Air quality - Operational	• Speed limits on access track to bore pad during dry weather to keep dust generation to a minimum.	Council and Project/Construction Manager Post-construction
Non-aboriginal heritage	Non-aboriginal heritage - General	• If archaeological remains or items defined as relics under the NSW Heritage Act 1977 are uncovered during the works, all works must cease in the vicinity of the material/find and Council's Manager Strategic Planning and Environmental Officer are to be contacted immediately.	Council and Project/Construction Manager Pre-construction Construction

Environmental Section	Impact	Mitigation measures	Responsibility and timing
		• Council's workers and all staff must be made aware of the heritage sites and place that occur within the area and all care must be taken to avoid interference with and damage to these sites. • Heritage sites must be clearly fenced/flagged with removable flagging or other temporary means to delineate their presence and in order to prevent them being harmed during the construction process.	
Aboriginal heritage	Aboriginal heritage - General	• All land ground disturbance activities must be confined to within the study area, as this will eliminate the risk of harm to Aboriginal objects in adjacent landforms. Should the parameters of the proposal extend beyond the assessed areas, then further archaeological assessment is required. • All staff and contractors involved in the proposed work should be made aware of the legislative protection requirements for all Aboriginal sites and objects. • If during works Aboriginal artefacts or skeletal material are noted, all work should cease and the procedures in the Unanticipated Finds Protocol (Appendix 2 of the ADD) should be followed. • Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts (Appendix 3 of the ADD) and are aware of the legislative protection of Aboriginal objects under the National Parks & Wildlife Act 1974 and the contents of the Unanticipated Finds Protocol. • The information in the ADD meets the requirements of the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales. It should be retained as shelf documentation for five years as it may be used to support a defence against prosecution in the event of unanticipated harm to Aboriginal objects.	Council and Project/Construction Manager Pre-construction Construction

Environmental Section	Impact	Mitigation measures	Responsibility and timing
Biodiversity	Biodiversity – Timing of works	• Where practicable, works are to be completed outside of key breeding seasons (Spring) for species likely to utilise adjacent native vegetation for breeding, to avoid nest abandonment. • To reduce cumulative impacts to native biota, works are to be timed so as to not directly coincide with other proposals within the Program.	Council and Project/Construction Manager Construction
	Biodiversity – Tree protection	• No canopy vegetation (trees) are to be removed, as impacts to trees are limited to limb lopping only • Clearly delineate vegetation to be removed/retained with the assistance of an ecologist, or similarly qualified professional, and induct all site personnel as to the approved extent of ground cover vegetation clearing. Ensure that no clearing of vegetation occurs outside of the marked boundary. • The presence of a suitably qualified arborist is recommended during earthworks occurring near retained trees to avoid rootzones impacts. • Ensure all work crew understand the importance of habitat features onsite including stags, fallen timber and logs. Avoid impact to all habitat within the subject site wherever possible. •	Council and Project/Construction Manager Construction Post-construction
	Biodiversity – Rehabilitation	• The drill pad and any other excavated areas to be stabilized as soon as possible using the most appropriate combination of the following measures: ○ Hydromulching with appropriate native grass mixture and/or groundcover species; ○ Turfing with appropriate native grass mixture and/or groundcover species,	Council and Project/Construction Manager Post - construction

Environmental Section	Impact	Mitigation measures	Responsibility and timing
		○ Seeding with appropriate native grass mixture and/or groundcover species; and/or ○ Revegetation using appropriate native tubestock or mature seedlings. • Areas to be re-seeded may be marked in the CEMP as a record of rehabilitation efforts made. Vegetation cover should be returned to the site within a reasonably practicable timeframe post construction to reduce soil exposure and loss. •	
	Biodiversity – General	• Vehicles and machinery not to extend beyond the direct impact footprint. • Strict hygiene protocols must be followed to ensure that no environmental weeds are spread around during works or are introduced to site as a result of the proposed works. If weeds are accidentally transported to site, or identified during construction activities, all weed material should be immediately contained and removed from site. • All machinery and vehicles are to be clean and inspected prior to arriving on-site to reduce the spread of weeds and disease (e.g. *Phytophthora cinnamomi*) to the site. • Locate stockpile sites away from waterways, drainage lines and native vegetation in a cleared area, within pre-approved zones. Ensure these are appropriately stabilized in accordance with the 'Blue Book' (Landcom 2004). • Appropriate erosion and sediment migration reduction/control measures should be in place. • Heavy vehicles are not to be parked under tree drip lines/ leaf canopy to avoid compaction of soil, which is damaging to mature native trees and can cause dieback or tree mortality.	Council and Project/Construction Manager Pre-construction Construction Post-construction

Environmental Section	Impact	Mitigation measures	Responsibility and timing
		• Declared weeds must be managed according to requirements under the Biosecurity Act 2015. All Weeds of National Significance should be managed to ensure they do not spread, and where possible eradicated.	
Traffic and Transport	Traffic and Transport - General	• Consider the location of designated parking areas, stockpile locations, construction laydown sites, site offices, and access routes carefully in consideration of creating inconveniences to local residents, and to the other environmental constraints. • Works are to minimise impacts to residents/landholders by maintaining vehicular access on The Escort Way at all times. • All road signs and marking will be in accordance with the RMS Guide to Signs and Markings; Australian Standards AS1742 and AS1743; and the Australian Roads Guide to Traffic Management. • Traffic and transport complaints are to be monitored and addressed promptly where practicable. •	Council and Project/Construction Manager Pre-construction Construction
Waste and resource use	Waste and resource use - General	• All wastes generated as part of this Proposal will be managed in accordance with the Protection of the Environment Operations Act 1997, and EPA and Council guidelines. • Resource management hierarchy principles are to be followed; namely, the avoidance, reduction, reuse and recycling of resources. • If stockpile or laydown sites are required in locations that have not been considered as occurring within the impact footprint as part of this REF, additional approval will need to be sought prior to any clearing taking place.	Council and Project/Construction Manager Construction Post-construction

Environmental Section	Impact	Mitigation measures	Responsibility and timing

		• Requirements under the Landcom (2004) stockpile management procedure must be observed, including correct placement of earth banks (with sedimentation ponds) to divert water around stockpiles if placed on a slope, and/or filter fences erected below stockpiles to capture any sediment moving offsite.
		• Bulk project waste (e.g. clean virgin excavated natural material or clean fill) sent to a site not owned by Council (excluding DPIE licensed landfills) for land disposal is to have prior formal written approval from the landowner.
		• Waste is not to be burnt on site and all general waste will be contained and disposed of at suitable waste facilities.
		• Where possible, materials with recycled content will be sourced, and minimum quantities ordered to reduce wastage.
		• If contamination is encountered during construction, a site assessment must be undertaken in accordance with the Protection of the Environment Operations Act 1997 (POEO Act).
		• Toilets will be provided for construction workers for the duration of the works to prevent human wastes entering the waterway.
		• Waste management for construction projects should be undertaken in accordance with the NSW Waste Avoidance and Resource Recovery Act 2001. The objectives of the Act are:
		  ○ To encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of Ecologically Sustainable Development (ESD);
		  ○ to ensure that resource management options are considered against a hierarchy of the following order: Avoidance of unnecessary resource	

Environmental Section	Impact	Mitigation measures	Responsibility and timing
		consumption, Resource recovery (including reuse, reprocessing, recycling and energy recovery), disposal; ○ to provide for the continual reduction in waste generation; ○ to minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste; ○ to ensure that industry shares with the community the responsibility for reducing and dealing with waste; ○ to ensure the efficient funding of waste and resource management planning, programs and service delivery; ○ to achieve integrated waste and resource management planning, programs and service delivery on a State-wide basis; ○ to assist in the achievement of the objectives of the Protection of the Environment Operations Act 1997. • Don't over-order, to ensure wastes are reduced from procurement through to commissioning.	
Visual amenity	Visual amenity - General	• The works area is to be kept free from rubbish and stockpile sites actively managed. • Vehicles are to be parked in designated areas only. • No additional, unauthorised clearing or destruction of vegetation is to occur. • Cleared, bare patches of ground that form part of the works are to be revegetated and restored following cessation of works. • Obvious and intrusive signs/machinery/equipment are to be removed from the site at the first opportunity.	Council and Project/Construction Manager Construction

Environmental Section	Impact	Mitigation measures	Responsibility and timing
		• Any complaints received regarding visual amenity at the site are to be dealt with and rectified as soon as possible.	

Climate Change	Climate Change - General	• Resource management hierarchy principles are to be followed:
		  ○ Avoid unnecessary resource consumption as a priority;
		  ○ Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery); and
		  ○ Disposal is undertaken as a last resort (in accordance with the Waste Avoidance & Resource Recovery Act 2001).
		• Council to ensure the renewable energy systems installed are adequate to provide energy for the operation of the proposed works.
		• Quality assurance and life cycle of materials are to be considered when purchasing, to ensure the newly built infrastructure is resilient and structurally sound.
		• Local resources are to be used wherever possible, to reduce waste and increase efficiencies.
			Council and Project/Construction Manager
			
			Construction

	Climate Change - Operational	• Regular maintenance of machinery associated with bore to ensure energy efficiency. • Consider the use of renewal energy sources for ongoing bore operation to reduce fossil fuel consumption.	Council Post construction