Wolgan Road Emergency Bypass

Review of Environmental Factors

November 2022

Prepared for Lithgow City Council

Review of Environmental Factors – Wolgan Road Emergency Bypass

Document Verification

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This Report has been prepared by The Environmental Factor (TEF) at the request of NSW Public Works Advisory (PWA), on behalf of Lithgow City Council (LCC or Council) to assess the matters affecting or likely to affect the environment by reason of the proposed construction of an emergency bypass to a damaged section of the Wolgan Road in the in the LCC Local Government Area (LGA), NSW. This document is not intended to be utilised or relied upon by any persons other than PWA or LCC, 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 report have been prepared by TEF from material provided by PWA and LCC and from material provided by the NSW Department of Planning and the Environment (DPE) and the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW), and 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) and demonstrates how the environmental factors specified in clause 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.

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Figures, Tables and Plates

ABBREVIATIONS

Abbreviation	Description
ACHA	Aboriginal Cultural Heritage Assessment
ACT	Australian Capital Territory
ADD	Aboriginal Due Diligence
AHIMS	Aboriginal Heritage Information Management System
AOBV	Area of Outstanding Biodiversity Value
ASS	Acid Sulphate Soils
Avg.	Average
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016*
BC Regulatory Act	*Biodiversity Conservation Regulatory Act 2017*
Biosecurity Act	*NSW Biosecurity Act 2015*
BOM	Bureau of Meteorology
BOS	Biodiversity Offset Scheme
BVM	Biodiversity Values Map
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
CL Act	*Crown Lands Act 1989*
DA	Development Application
DAWE	Department of Agriculture Water and the Environment (now DCCEEW)
DCCEW	Department of Climate Change, Energy, Environment and Water
DECC	Department of Energy and Climate Change
DPI	Department of Primary Industries
DPE	Department of Planning and Environment (formerly DPIE and OEH)
EEC	Endangered Ecological Community
ECP	Environmental Control Plan
EIS	Environmental Impact Statement
EPA	Environmental Protection Authority
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2021*
ERSD	Erosion and Sediment
ESD	Ecologically Sustainable Development
FFA	Flora and Fauna Assessment
Fire Trails Act	The Rural Fires Amendment (Fire Trails) Act 2016
FM Act	*Fisheries Management Act 1994*
GBD	General Biosecurity Duty
GHG	Greenhouse Gasses

Abbreviation	Description
GI	Geotechnical Investigation
ha	Hectare
Heritage Act	*Heritage Act 1997*
IBRA	Interim Biogeographic Region of Australia
ICNG	Interim Construction Noise Guidelines
KFH	Key Fish Habitat
LALC	Local Aboriginal Land Council
LCC or Council	Lithgow City Council
LEP	Local Environmental Plan
LGA	Local Government Area
LLS	Local Land Services
LLS Act	*Local Land Services Act 2016*
LLSA Act	*Local Land Services Amendment Act 2016*
LOO	Likelihood of Occurrence
MNES	Matters of National Environmental Significance
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
NSW	New South Wales
NVR	Transitional Native Vegetation Regulatory Map
OEH	Office of Environment and Heritage (now DPE)
PAD	Potential Archaeological Deposit
PMO	Project Management Officer
POEO Act	*Protection of the Environment Operations Act 1997*
RCP	Representative Concentration Pathway
RF Act	*Rural Fires Act 1997*
RFS	Rural Fire Service
SAII	Serious and Irreversible Impacts
SEPP	State Environmental Planning Policy
SIC	Significant Impact Criteria
SIS	Species Impact Statement
SWMP	Soil and Water Management Plan
TBC	To be confirmed
TEC	Threatened Ecological Community
TEF	The Environmental Factor
TfNSW	Transport for NSW
TMP	Traffic Management Plan
WM Act	Water Management Act 2000
WoNS	Weed of National Significance

EXECUTIVE SUMMARY

The Environmental Factor (TEF) has been engaged by NSW Public Works Advisory (PWA) on behalf of Lithgow City Council (LCC) to undertake a Review of Environmental Factors (REF) to fully consider the potential environmental issues arising from the proposed construction of an emergency diversion road around a section of Wolgan Road which was damaged by a landslide in November 2022, in the Wolgan Valley, NSW (the Proposal). The Proposal involves the construction of a 2.16 km length emergency bypass access road commencing approximately 4 km north of the township of Lidsdale, and terminating approximately 200 m south of the 'Kurraco Ridge' property driveway. The Proposal is intended to provide an alternative, safe access road to bypass the section of Wolgan Road, which is presently impassable, to reinstate access to the Wolgan Valley whilst the main road undergoes major repairs, and to provide an alternative to the current access road which follows the Old Coach Road which traverses the National Parks and Wildlife Service (NPWS) estate and is subject to flooding.

This report has considered to the fullest extent possible the potential environmental impacts with potential to arise from the Proposal within the framework of Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), and has considered:

- Impacts on Matters of National Environmental Significance (MNES) under the *Environmental Protection and Biodiversity Act 1999* (EPBC Act) (refer Section 5.1, Appendix B)
- Environmental impacts in accordance with s5.5 of the EP&A Act and cl 171(2) of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) (refer Sections 3.2.3 and 4)
- Impacts on threatened species in accordance with s7.8 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, 4.7 and Appendix B)

This report identifies where proposed construction works could impact the surrounding environment. The subject site occurs within remnant forest in the Blue Mountains in close proximity to, and roughly parallel with, the Wolgan Road. The alignment generally follows an existing track which is predominantly cleared of large trees, and generally dominated by regrowth native vegetation. Some larger remnant trees, including fire effected trees, stags and hollow-bearing trees along the edges of the existing track will require removal to construct the roadway at the required width.

The study area is comprised of a combination of Crown Land lots and private freehold land; Council is seeking concurrence and a Crown Land Licence from NSW Crown Lands for the Proposal. Large areas of native vegetation within and adjacent to the subject site have been affected to varying degrees by the 2019 / 2020 bushfires, and are subsequently in a range of conditions, and in many areas are dominated by immature and regrowth vegetation.

The site is connected to large tracts of native vegetation within the Blue Mountains. Newnes State Forest occurs to the east and south of the subject site, and Ben Bullen and Wolgan State Forests occur to the north and the west of the site. In addition, The Blue Mountains National Park, Wollemi National Park and Gardens of Stone National Park are all connected to the subject site in the wider locality.

Plant Community Types (PCTs) were difficult to accurately determine during the site surveys due to both the modification of the communities present, and a lack of reproductive material on mature eucalypt species present at the time of the site assessment. Subsequently, PCTs were assigned based on best fit using landscape position and species composition derived from the identifiable floristic material available.

The following ecological impacts are associated with the Proposal:

- Total impact area (subject site) of approximately **1.30 ha** (comprised of **1.11 ha** native vegetation, and **0.19 ha** of existing disturbed track), including mature trees.
- Thirteen (13) hollow-bearing trees, nest trees and stags (habitat trees) and twenty-five (25) mature eucalypts considered large enough to support habitat resources were recorded within or immediately adjacent to the subject site which are likely to be directly impacted. Five (5) habitat trees and three (3) mature eucalypts are recommended to be retained, however due to the nature of the works (difficult to construct landscape), this may not be possible, and this assessment has assumed the removal of all of the above as the worst case scenario.
- Indirect impact potential on an additional **5.21 ha** of vegetation (native vegetation comprises **4.91 ha**) occurring within the study area through increased noise and activity disturbance during construction, which has the potential to impact species present within these areas.
- Potential injury or mortality of terrestrial, aquatic and semi-aquatic fauna within the Proposal footprint during vegetation clearing and construction
- Flora and fauna surveys, including habitat assessments and incidental flora and fauna recordings were completed during the site visit to identify important habitat components for any threatened species or ecological communities recorded, or with the potential to occur, within the locality. Based on the desktop assessment, site visit and habitat assessments undertaken, **thirty-two (32) threatened fauna** species and **three (3) threatened flora** species were considered as having the potential to be impacted as a result of the Proposal

Assessments of Significance completed under the *Biodiversity Conservation Act 2016* (BC Act) and Significant Impact Criteria assessments completed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) determined that impacts to threatened species, populations or ecological communities are **unlikely** to be significant.

No major waterways occur within the study area; however, the Wolgan River is situated approximately 100 m to the east of the Proposal, and five (5) unnamed waterways intersect the Proposal footprint. One (1) unnamed watercourse (3rd Order Waterway) occurs at the northern extent of the subject site, and flows north-east where it discharges into the Wolgan River. The northern portion (3rd Order Waterway) of this tributary is mapped as Key Fish Habitat (KFH), and the subject site intersects the waterway in this area. The potential for impacts to waterways and the required safeguards that must be implemented are outlined in Section 4.2.

Local, and NSW State historic heritage registers were consulted as part of preparation of this REF document (Section 4.5); while the original stonework associated with the Donkey Steps track occur in proximity to the site, no listed non-Aboriginal heritage sites were found within close proximity to the Subject Site and no sites were deemed at risk of damage from the Proposal. An Aboriginal Due Diligence Assessment was underway at the time of writing the REF and will be completed prior to any work commencing along the alignment. A search of the AHIMS register identifies a number of known Aboriginal sites within 1km of the study area, including Maiyingu Marragu (Blackfellows Hands) which is a collection of Aboriginal hand stencils located in a cave off Wolgan Road to Newnes, approximately 600 m south east of the study area.

All work will be completed under the guidance of a Construction Environmental Management Plan (CEMP) to manage and minimise potential environmental impacts associated with the work. Once operational, the Proposal is not expected to cause any significant detrimental environmental or community impacts. The proposed Wolgan Road emergency bypass is anticipated to have positive

socio-economic benefits for the local community, through the provision of temporary safe access throughout the duration of the Wolgan Road repair works. Given the nature, scale and extent of impacts, and assuming strict implementation of the measures outlined in this REF, the Proposal is **unlikely to have a significant adverse impact** on the environment. It is considered that all matters affecting or likely to affect the environment by reason of the Proposal have been considered as required by s5.5 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

1. INTRODUCTION

The Environmental Factor (TEF) has been engaged by NSW Public Works Advisory (PWA) on behalf of Lithgow City Council (LCC or Council) to undertake a Review of Environmental Factors (REF) to fully consider the environmental issues with the potential to arise from the proposed construction of an emergency bypass road, approximately 2.16km in length around a landslide damaged section of Wolgan Road, commencing approximately 4 km north of Lidsdale, NSW.

Wolgan Road is used primarily by local traffic to access agricultural properties in the Wolgan Valley, and visitors to the valley. There is no suitable alternative all weather public access to the Wolgan Valley, with the Wolgan Road the only all-weather, two-wheel drive route. On November 9th, 2022, heavy rainfall resulted in a landslide over the Wolgan Road, rendering the road impassable, and effectively isolating properties in the Wolgan Valley situated north of Wolgan Gap. The Proposal involves the construction of an approximately 2.16 km length emergency access road commencing approximately 4 km north of the township of Lidsdale, and terminating approximately 200 m south of the 'Kurraco Ridge' property driveway, in order to bypass the section of Wolgan Road which is presently destroyed, to therefore temporarily reinstate access to the Wolgan Valley whilst the Wolgan Road undergoes major repairs.

1.1. Project background

Wolgan Road is a two-lane, sealed all-weather road within the Wolgan Valley, serving as the only suitable access to the valley and small village of Newnes at the termination of the road. The Wolgan Road services a number of private properties, the rural campus for Cranbrook School, and tourism destinations including the Wollemi National Park, Gardens of Stone National Park, and the Emirates Resort.

During heavy rainfall events in November 2022, a section of the road commencing four (4) kilometers north of Lidsdale underwent significant damage via a landslide and rockfall onto the road in several sections, effectively isolating people and properties in the Wolgan Valley from emergency services and access to town, including provisions, schools and medical assistance. Council, with assistance from PWA propose constructing an emergency access road to bypass the damaged section of Wolgan Road for use whilst options for securing and stabilizing the cliff face above the road to prevent further landslides are investigated and the road itself undergoes any necessary repairs. Presently the only option for residents to come and go from the valley is via the Old Coach Road, which passes through NPWS estate up onto Glow Worm Tunnel Road on the Newnes Plateau, with the assistance of a pilot vehicle making two (2) return journeys per day. This route requires a four wheel drive vehicle, and is impassable in heavy rain due to high water levels where the road crosses the Wolgan River.

Part of the proposed emergency bypass takes in the 'Donkey Steps track' alignment, a route now used by bushwalkers, which served as the original route into the Wolgan Valley in the late 1860's. Donkey Steps track follows an alignment roughly parallel to Wolgan Road. A rough and overgrown track exists for the length of the proposed alignment, following the installation of communication infrastructure that continues through to the Emirates Resort that was installed approximately ten years ago. This track was more recently accessed during the catastrophic 2019 / 2020 bushfires, at which time a bulldozer followed by a fire truck accessed the Wolgan Valley floor via the Donkey Steps as the main road was cut off by the fires.

Construction of the emergency access road is proposed to start as soon as possible, with the works to make the alignment safe for vehicles estimated to take 3 – 4 weeks, weather permitting.

The landslide affected section of Wolgan Road has undergone significant damage and requires major works to reinstate the road to its pre-damaged condition, and remove or secure the rocks above to ensure ongoing safety for road users. These works are estimated to take approximately 12 months to complete.

1.2. Project Objectives

The primary goal of the emergency bypass project is to provide safe temporary, alternative access to the Wolgan Valley as soon as possible whilst the Wolgan Road is undergoing repairs. The secondary objective is to achieve this primary goal with minimal impact to native biota.

Project objectives will be achieved thorough pre-commencement impact boundary delineation, careful design and construction methodology to stabilize and ensure safe ingress/egress via the bypass trail, and minimise potential impacts to native flora and fauna including completion of pre-clearing surveys, and site inductions for work personnel, in combination with implementation of the Environmental Safeguards provided in this report.

1.3. Site description

The proposed emergency bypass road commences approximately four (4) kilometers north of Lidsdale, and extends to approximately 200 m south of the 'Kurraco Ridge' property driveway within the Lithgow City Council LGA, running roughly parallel to the Wolgan Road (Figure 2 Study area and Subject site

The subject site occurs within remnant and regenerating forest in the Wolgan Valley, with the Blue Mountains nearby. The bypass road alignment runs roughly parallel to Wolgan Road. The alignment generally follows an existing track which is predominantly cleared of large trees, and generally dominated by regrowth native vegetation. Some larger remnant trees, including fire effected trees, stags and hollow-bearing trees occur along the edges of the existing track and will require removal to construct the bypass at the required width.

The northern portion of the subject site runs through a valley, and the remnant woodland vegetation in this area is heavily fire effected and dominated by dense regeneration as a result of the 2019 / 2020 bushfires. In fire effected areas, many annual weedy species are present within the understory. As the subject site progresses steeply uphill to the south along the western face of a ridge, the fire damage (and subsequent regeneration) is less prevalent. The southern section of the site occurs along steeper, rocky slopes and is clear of vegetation in areas; the southernmost section of road is an established built-up section, complete with culverts to allow surface water to flow from the swampy area downslope on the plateau. Fire damage either side of the southern portion of the track is less severe, potentially due to the steep drop off to the west and steep incline to the east.

The area is intersected by a number of waterways, and the site is adjacent to the Wolgan River on the valley floor. An unnamed watercourse (2nd Order Stream) occurs at the northern extent of the subject site, and flows north-east where it discharges into the Wolgan River. The northern portion (3rd Order Stream) of this tributary is mapped as Key Fish Habitat (KFH), and the subject site intersects the waterway in this area (see Figure 6). The proposed alignment crosses the same watercourse again, further to the south (2nd Order Stream), as well as an additional two (2) unnamed watercourses (1st Order Streams) which discharge into the same 2nd order stream. The unnamed 1st order streams were not actively flowing at the time of surveys, though water was present and flowing across the surface of some sections of the track in the subject site.

The site is connected to large tracts of native vegetation within the Blue Mountains. The Newnes State Forest occurs to the east and south of the subject site, and Ben Bullen and Wolgan State forest occur to the north and the west.

The majority of the study area is located in areas of Category 2 – Regulated Land on the Native Vegetation Regulatory Mapping, with some areas to the northernmost and southernmost extent of the subject site not mapped on the NVR map.

An area mapped as containing biodiversity values on the Biodiversity Values Map occurs to the north of the subject site along Wolgan River. This area is located within a 500 meter radius of the subject site, however falls outside of the subject site and would not be directly impacted by the proposal.

Table 1 Site details

<table>
<tr><th colspan="2">Site details</th></tr>
<tr><td>Road name / Property name Lot /DP</td><td>Wolgan Road
<table>
<tr><th>Lot number</th><th>Plan</th><th>Tenure</th></tr>
<tr><td>-</td><td>-</td><td>Ben Bullen State State Forest NSW</td></tr>
<tr><td>40</td><td>DP751636</td><td>FREEHOLD</td></tr>
<tr><td>7006</td><td>DP1055080</td><td>CROWN</td></tr>
<tr><td>7001</td><td>DP1055079</td><td>CROWN</td></tr>
<tr><td>7300</td><td>DP1139065</td><td>CROWN</td></tr>
<tr><td>11C</td><td>DP751666</td><td>FREEHOLD</td></tr>
<tr><td>10D</td><td>DP751666</td><td>FREEHOLD</td></tr>
</table></td></tr>
<tr><td>Closest crossroad(s)</td><td>Groves Road, Lidsdale</td></tr>
<tr><td>Land zoning</td><td>RU2 – Rural Landscape
RU3 – Forestry</td></tr>
<tr><td>IBRA region</td><td>Sydney Basin</td></tr>
<tr><td>IBRA sub region</td><td>Wollemi</td></tr>
</table>

Table 2 Definitions

Term	Description
Subject Site	The area to be directly affected by the Proposal, including the area proposed for the new road diversion around the impacted section of Wolgan Road. This is comprised of a **2.16 km** section of road approximately 6 m wide. A total direct impact area of **1.3 ha**, of which **1.1 ha** comprises native vegetation.
Study Area	Includes the subject site (as described above) and any proximal areas that could be potentially indirectly impacted by the proposal (assumed to be restricted to a 9 m buffer either side of the subject site). This equals a total impact area (direct and indirect) **5.21 ha** of which native vegetation equals **4.91 ha**. The subject site and study area are shown in Figure 2
Locality	Is the area within 10 kilometres of the study area

2. PROPOSAL DESCRIPTION

The Proposal, as assessed herein, constitutes constructing a 2.16 km long emergency access road to bypass a section of Wolgan Road which was damaged due to heavy rainfall and landslides in November 2022. These events have rendered this section of Wolgan Road impassable for regular traffic. The Proposal occurs within the Wolgan Valley, in the Lithgow City Council LGA, NSW.

The proposal involves clearing and widening an existing, roughly formed access track which was re-established during the catastrophic 2019 / 2020 bushfire events, to a nominal 6 m width. The works will include the establishment of passing bays where the terrain permits. No excavation along the alignment will be permitted, as sub-terranean communication infrastructure exists along the majority of the alignment. Sections of the road will require fill to be placed to enhance the safety and usability of the route, with the fill sourced either side of the track or off site, where feasible; sections of the trail are steep and precarious, and material will need to be sourced from the steep rock embankment in these locations as transporting material into the site is not feasible. The temporary diversion will be strictly for residents including the Emirates Resort, Council and emergency vehicle use, with signage and locked-gates at each end of the diversion, and camera traps strategically placed along the route to ensure compliance.

The route will be single lane, four wheel drive access only, and traffic management will involve using a pilot vehicle for residents to follow until such a time a safe passage can be achieved using a traffic light system. The emergency bypass works will be funded by NSW / Federal Government and LCC through the Australian Government Natural Disaster Relief and Recovery Arrangements program.

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.

A proposed construction methodology has been included as Appendix A.

2.1. Design principles

The core principles for the design and operation of the Proposal are to provide safe, single lane access using the alignment of the existing track, in order to reduce the need for impacts to remnant vegetation and waterways that exist outside the current impacted alignment. Currently the track is impassable in a light two-wheel vehicle; the Proposal would improve the surface and useability of the track by removing debris and vegetation, redirecting surface water flows, and compacting and stablising the road surface to reduce the risk of incidents throughout the period the emergency access road is operational; however, due to the steep and rocky nature of the alignment, the bypass road will remain accessible by four-wheel drive vehicles only and will be signposted accordingly.

During the operational phase of the emergency access road, traffic control will be required to ensure safe single lane passage of vehicles.

2.2. Justification for the proposed works

Currently residents including the Emirate Resort, visitors and Cranbrook School students are isolated in the Wolgan Valley, with Wolgan Road closed. Typically, Wolgan Road serves as the only all-weather, two-wheel drive access into and out of the valley. Upgrading the existing Donkey Steps track will reinstate temporary access into the Wolgan Valley as an alternative to the Old Coach Road track, allowing for the transport of supplies, and a safe passage for individuals during the construction works of the damaged Wolgan Road. In the event of an emergency, the Donkey Steps emergency bypass road would enable an additional egress from the Valley, should access via Old Coach Road be cut off;

the existing causeway on Old Coach Road crosses Wolgan River, which has been flagged by Council for upgrade as it is subject to flooding.

2.3. Options Considered

Council and PWA considered the following options for these works:

1) Construct a temporary diversion around the destroyed section of Wolgan Road, via the Donkey Steps access trail which was roughly re-established during the 2019 / 2020 bushfires, to provide a new emergency bypass road to meet grant funding requirements; this road will allow access to the Wolgan Valley during the design and repairs of the main road.
2) Continue using the existing four-wheel drive track out of the Wolgan Valley via the Old Coach Road, passing through NPWS estate up onto Glow Worm Tunnel Road on the Newnes Plateau, with the assistance of a pilot vehicle making one (1) return journey per day. If rain continues, this road is subject to flooding and would be impassable.
3) Continue to use the Old Coach Road until the Donkey Steps access trail is established for safe four-wheel drive (4WD) access, while repairs for the main Wolgan Road are investigated. This ensures there is a secondary egress for the local community in the immediate term, and provides alternative access in case of future emergency.
4) Cease access to the Wolgan Valley until the Wolgan Road is repaired.

Council elected to proceed with Option 3, to upgrade the existing track to allow for a safe alternative passage during the construction works of the Wolgan Road, while continuing to use Old Coach Road as needed. The Wolgan Road requires major work to repair the damage caused by the landslide, with Council indicating it may remain shut for approximately 12 months. Establishing reliable access, particularly to those working and / or living in the Wolgan Valley, is paramount to the community and a secondary emergency bypass considered critical; therefore Option 3 was considered the safest, most practical and economic option for the community, Council and its ratepayers.

2.4. Construction and Operation

The following sub-chapters describe the intended construction and operation methodologies that will be implemented as part of the Proposal to construct a 6 m wide emergency access road.

2.4.1. Description of Construction Works

The following construction activities are proposed:

- Demarcate alignment to flag sensitive areas, particularly waterways, followed by mulching of understorey to achieve suitable line of sight, using an excavator with a mulcher head attached to shred mid and understorey, including dense Eucalypt regrowth along the valley floor.
- Tap fallen logs placed along southern section of road to encourage fauna to vacate, then move logs to the side of the direct impact zone in order to retain habitat features of the site. Same to be completed for fallen logs in the broader impact area. Logs to be placed so as to minimise impacts to surface hydrology and / or reduce erosion.
- Any hollow-bearing trees or large habitat trees to be checked by a qualified person prior to felling; trees to be felled using excavator with a grab attachment and lowered gently to the ground to be checked for fauna occupation.
- Spray blackberry along alignment and ensure biosecurity measures adhered to, including vehicle wash / cleaning activities to be undertaken.

- Construct approximately 12 box culverts; in drier areas these will be plastic 450 mm diameter by 6 m length. In wetter areas these will be recycled plastic pipes 600 mm in diameter, with a concrete headwall at each end.
- Locate and clearly mark the communications infrastructure prior to installing culverts. Culverts are to straddle the cables where necessary.
- If and where required, gabion baskets to be installed adjacent to culverts, with rock sourced on site.
- Excavators will obtain material to the sides of the road, placing material onto the road to be spread and compacted by a bulldozer. VENM will be imported to site from alternative stockpile locations as necessary.
- In particularly wet sections, lime will be added to aid the compaction of sediments, and geofabric used over the top to support and stabilise prior to repeating compaction process. The final surface will be finished with concrete mesh-joined pavers to allow water to infiltrate and (naturally reseeded) grasses to become established and permanently stabilise the surface.
- Utilise two (2) machines at all times to expedite the process of remobilising machines if / when they become stuck, with machines to assist each other as required.
- All waste to be removed from site, with receipts retained for 'chain of custody' for reportiong, as detailed in the CEMP.
- Machinery to be used will include:
    - 1 x D6 tracked dozer
    - 18T Padfoot/smoothdrum rollers
    - 18,000 L watercart
    - 2 x 20 T excavator
    - 1 x 15T excavator
    - 1 x Bobcat/backhoe
    - 1 x Gravel trucks (truck and dog trailer)
    - 2 x Crew trucks/utes
    - An array of small plant, jumping-jacks, chainsaws, whipper snippers etc.

The construction team will be comprised of approximately six (6) FTE people, plus ancillaries such as delivery drivers. Stockpiles and any construction offices and amenities as appropriate will be established in proximity to the construction area. Stockpile and overnight plant and equipment parking areas have not been formally assessed in preparing this REF and are not included in the subject site or impact area calculations.

Table 3 Types of works relevant to the Proposal

Types of works	Comments
Site preparation works	• Site demarcation. • Clearing of vegetation within the impact area. • Stockpiling and removal of waste green material. • Establishment of access routes for excavation and construction equipment, including placement of signage. • Establishment of layby areas, storage facilities and site office.

Types of works	Comments
Site levelling	• Grubbing and stripping of topsoil where required • Site preparation including depositing soil/sand to achieve correct ground levels for road construction • Stockpiling and removal of waste material including soil and road base
Road construction works	• Installing road base material such as sand and gravel to create temporary seal. • Installation of drainage features where required
Site rehabilitation works	• Site restoration works to achieve correct levels to stabilise and prevent erosion. • Recycling/disposal of excess fill material. • Spreading seed and planting trees to revegetate exposed soils. • 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.

2.4.2. Operation of the Proposal

The operational phase of the Proposal, considered as part of this REF, includes assessment of impacts associated with the use of the temporary Wolgan Road diversion once construction and site restoration works are complete. This includes cleared and resurfaced roads and any cumulative impacts the Proposal is likely to have on renewable and finite resources in terms of sustainability, ecology, climate change and community.

Once operational, the Donkey Steps Access Trail will be monitored regularly by Council staff, and initially accessed only via a pilot vehicle. The road will be gated and locked once construction has been completed, with locks accessible by locally community, Council and emergency personnel only. Once use of the access trail is established, all traffic will be directed under the control of pilot vehicle. 24/7 monitoring will be via lockable boom gates and security cameras to ensure ongoing safety and the prevention of recreational four-wheel driving damaging this critical access road. Traffic lights may be established at the top and bottom of the road to ensure unidirectional use and limit vehicles from attempting to pass each other if deemed practical after the undertaking of a Risk Assessment by Lithgow City Council and Public Works.

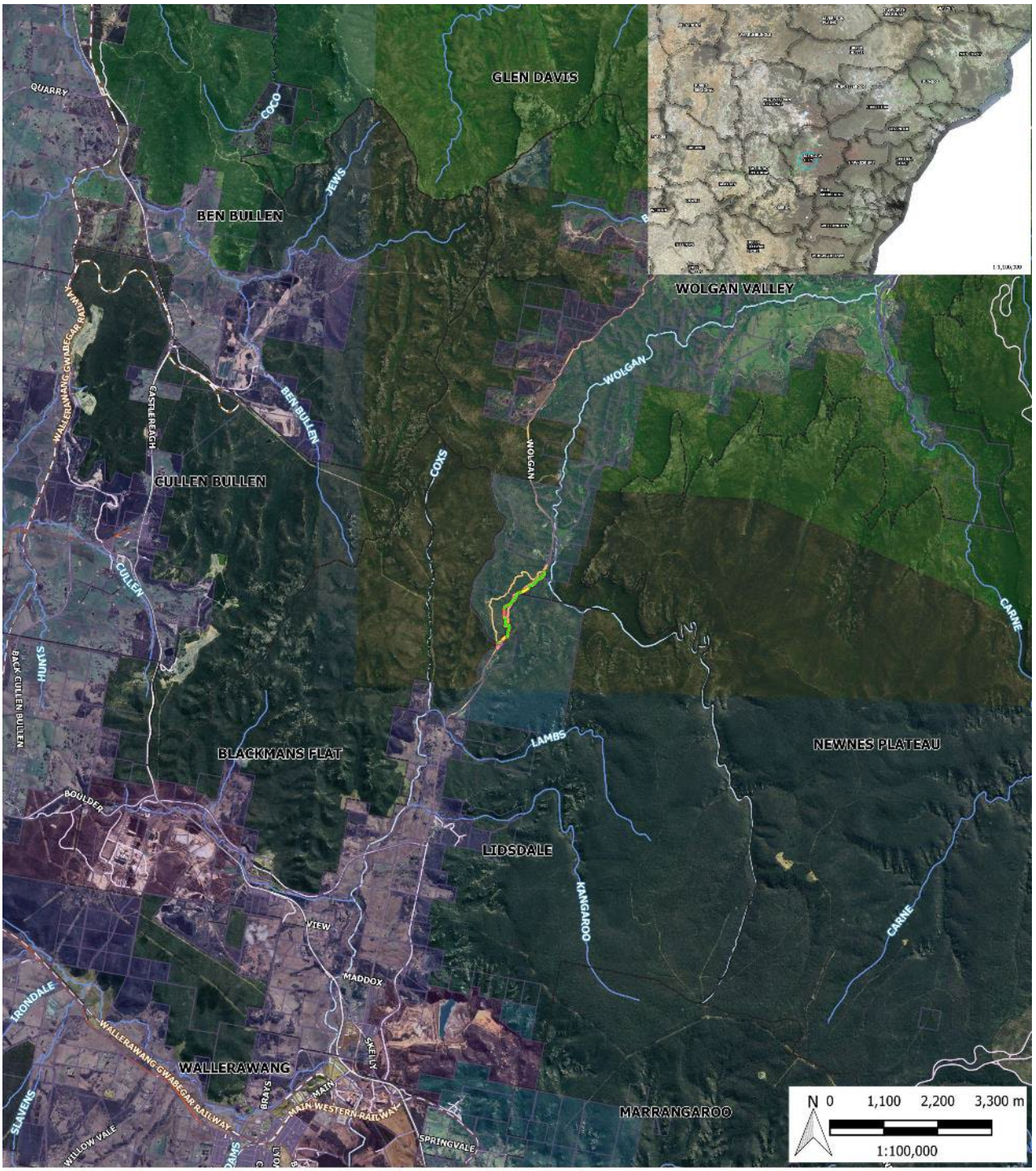
2.5. Environmental Safeguards

Throughout the environmental impact 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 act as 'conditions of consent' for the Proposal and **must be implemented** as part of project delivery (summary of which is provided as 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.

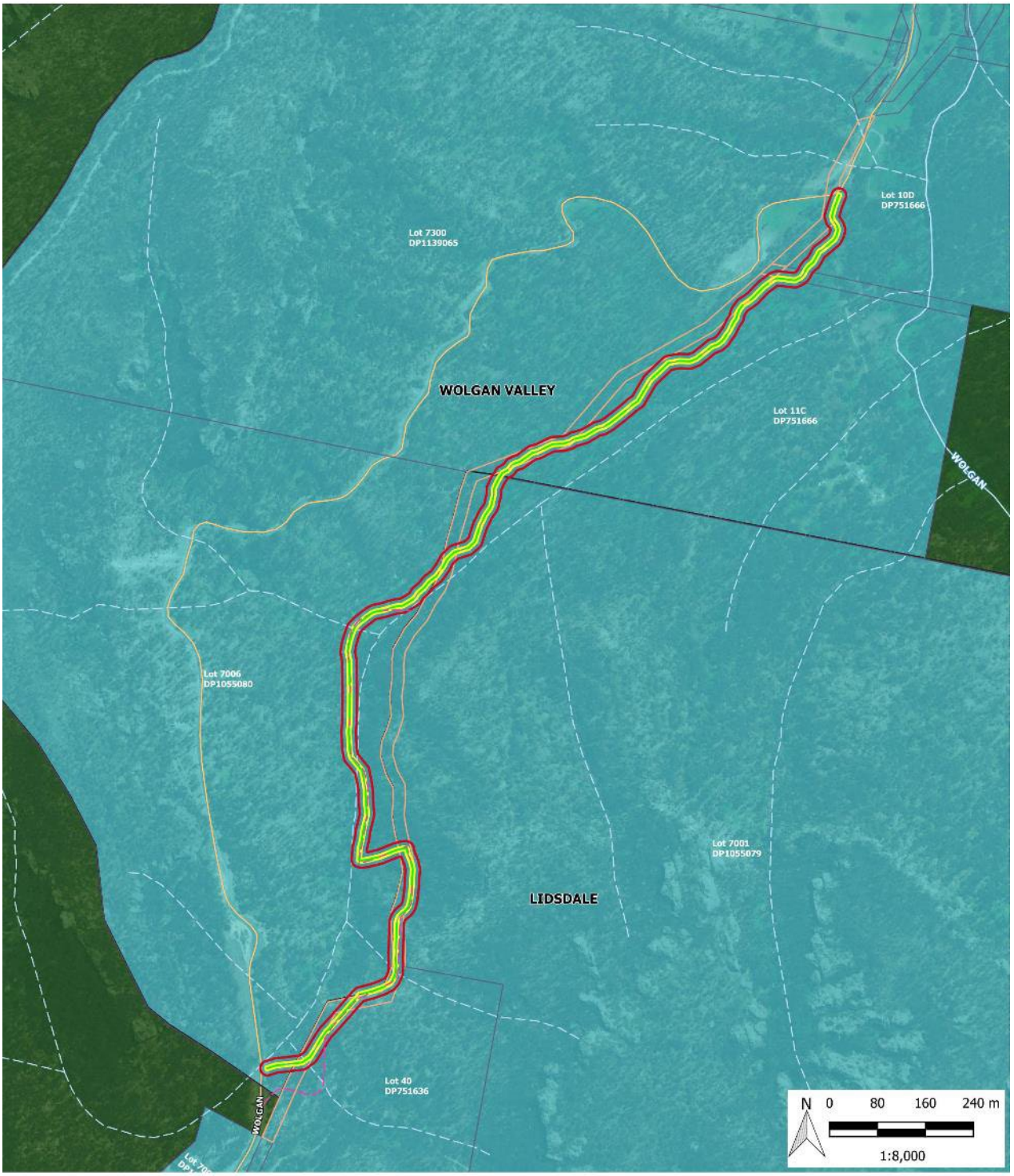


Wolgan Road Emergence Bypass - Regional Context and Land Zoning

Legend

- Study Area
- Subject Site
- Proposed Diversion Alignment
- Optic Fibre Alignment
- Existing Road Corridor
- Suburb
- Lot Boundary
- **Roads**
- Arterial Road
- Local Road
- Primary Road
- Sub Arterial Road
- Railway
- **Waterways**
- Creek
- River
- Gully
- **Land Zoning**
- C1
- IN1
- IN2
- IN3
- R5
- RU1
- RU2
- RU3
- RU5
- SP2

Figure 1 Regional context and land zoning



Wolgan Road Emergency Bypass - Subject Site and Land Zoning

Legend

- Study Area
- Subject Site
- Proposed Diversion Alignment
- Optic Fibre Alignment
- Existing Road Corridor
- Suburb
- Lot Boundary

Waterway

- River
- 1st and 2nd order unnamed waterways

Land Zoning

- RU2 - Rural Landscape
- RU3 - Forestry

Figure 2 Study area and Subject site

3. Legislative Context and Stakeholder Consultation

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. Relevant 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) 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
- A water resource, in relation to coal seam gas development and large coal mining development.

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.
- Assessment of potential impacts on MNES, if appropriate.

Potential impacts on relevant MNES must be subject to Assessments 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.

Significant Impact Criteria Assessments were completed for EPBC Act listed biota considered at risk of impact as part of the proposal (Appendix B).

This REF addresses the likelihood of MNES occurring within the locality of the proposed activity, and their potential to be impacted by the proposed activity (refer Section 1.8 and Appendix B). No MNES are likely to be significantly impacted by the Proposal.

3.2. Relevant NSW State Acts of Legislation and Related Policies

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

The Transport and Infrastructure SEPP consolidates and repeals the provisions of 4 SEPPS, which includes the previous Infrastructure SEPP (ISEPP) 2007. 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, Clause 2.56)
- Parks and other public reserves (Division 12, Clause 2.73)
- Roads and road infrastructure facilities (Division 17, Clause 2.109)
- Sewerage systems (Division 18, Clause 2.125)
- Soil conservation works (Division 19, Clause 2.132)
- Stormwater management systems (Division 20, Clause 2.136)
- Water supply systems (Division 24, Clause 2.158)
- Waterway or foreshore management activities (Division 25, Clause 2.164)

Each clause of the SEPP provides for development that is permitted without consent.

The Transport and Infrastructure SEPP aims to facilitate the effective delivery of infrastructure across the State. Clause 2.108 states that:

(1) Development for the purpose of a road or road infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land.

As the proposed works are appropriately characterised as development under the Transport and Infrastructure SEPP, the provisions of the Transport and Infrastructure SEPP apply. The proposed works can be carried out as activities under Division 5.1 of the EP&A Act. Development consent from Council is not required.

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 the 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 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 take into account 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).

The Proposal is being assessed under Division 5.1 of the EP&A Act, as outlined above. In accordance with s 5.5 of the EP&A Act, an REF examines and takes into account 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 171(2) 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. This Assessment of Significance is used to assist in the determination of whether a Proposal is 'likely' to impose 'a significant effect' on threatened biota and thus whether a Species Impact Statement (SIS) is required. Section 1.7 of the EP&A Act was addressed as part of the current assessment and assessments of significance were completed for relevant threatened species and ecological communities that are likely to be affected by the Proposal. These assessments are included in Appendix B.

This REF has identified that the Proposal is not likely to significantly affect the environment (Section 2); as such, Council will not need to obtain and consider an Environmental Impact Statement before it carries out the project (s 5.7 of the EP&A Act).

3.2.3. 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 constitute activities that are likely to generate significant pollution; however, consideration for the prevention of water, air, land and noise pollution is provided herein (refer Sections 1.3, 1.4, 1.5 and 1.11).

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 1.8 and Appendix B of this REF address potential impacts to threatened species and Threatened Ecological Communities (TEC) listed under the BC Act.

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 project 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 includes high biodiversity value lands along the riparian corridor of the Wolgan River approximately 100 m to the east of the subject site. There are no high

biodiversity value lands identified within the study area (search date 17/11/2022; Appendix B),
2. Area Criteria Threshold, and / or
3. Significant impact to threatened species or ecological communities.

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.

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

As the Proposal is being assessed under Division 5.1 of the EP&A Act, the clearing thresholds for native vegetation are not relevant to this Proposal. However, significant impacts to threatened species may require participation in the BOS with offset credit calculations required.

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 site.

3.2.6. 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. The proposed works will not impact upon any Aboriginal sites, assuming the Environmental Safeguards as outlined in Section 1.7.4 are followed.

Appendix C and Section 4.5 of this REF further addresses potential impacts and assessment undertaken on Aboriginal Heritage associated with the proposed works.

3.2.7. Heritage Act 1997 (Heritage Act)

The 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 1.6); no listed heritage sites are recorded within close proximity to the subject site and no sites were deemed at risk of damage from the Proposal (Figure 9).

3.2.8. 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 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 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*.

Further to the above, if a proposed work site is not within or adjacent to a waterway that constitutes Key Fish Habitat (as defined by DPI Fisheries), proponents do not need to obtain a permit for dredging, reclamation, or obstructing fish passage. A permit may still be required to harm marine vegetation (such as saltmarsh or mangroves) if such vegetation occurs on an unmapped waterway on public water land; or, to use explosives or electrical devices, as well as any other necessary approvals under other relevant legislation (such as the *Water Management Act 2000* (below), *Crown Lands Management Act* or the EP&A Act.

No explosives or electrical devices will be used as part of the road upgrade proposal; there is however one (1) waterway mapped as supporting Key Fish Habitat within the subject site that will require a crossing to be constructed, therefore consultation with DPI Fisheries is required to obtain a Part 7 Fisheries Permit.

3.2.9. Water Management Act 2000 (WM Act)

The *Water Management Act 2000* (WM Act), administered by the Water division of NSW Department of Industry – Lands and Water, 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 is exempt from s 91E(1) under the WM Act for projects approved under Division 5.1 of the EP&A Act, in relation to all controlled activities that it carries out in, on or under waterfront land (cl 41 Water Management (General) Regulation 2018). While exempt, it is still recommended that Council be aware of the WM Act and adhere to the associated guidelines as outlined below.

3.2.10. NSW Guidelines for Controlled Activities on Waterfront Land (NSW DPI 2012)

Any works proposed within the defined riparian zone of a creek are to be carried out in accordance with the WM Act. Works undertaken on waterfront land (i.e. near a river, lake or estuary) require a controlled activity approval under Section 91 of the WM Act, unless defined as exempt. It is anticipated that construction works will occur within the defined riparian zone of all three (3) waterways; however, as above, Councils, as a defined public authority, are exempt from the need to gain a controlled activity approval pursuant to clause 38 of the WM Regulation.

NSW DPI Water guidelines recommend riparian buffer distances to protect and maintain water quality and habitat. Recommended buffer distances are tabled below (Table 6). Works are not to be carried out within the Total Riparian Zone as described below. Development which encroaches within these riparian buffer distances are recommended to be offset using the 'averaging rule' outlined by NSW DPI Water.

Table 5 Riparian corridors based on stream order (NSW DPI)

Stream order	Vegetated Riparian Zone (each side of watercourse) (m)	Total Riparian Zone (m)
1st	10	20 + channel width
2nd	20	40 + channel width
3rd	30	60 + channel width
4th	40	80 + channel width

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 (DPI) 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.

Given the proposal's proximity to previously disturbed landscape and presence of weeds, it is anticipated that construction works as part of the proposal have the potential to introduce and spread weed seeds/spores and water mould (e.g. *Phytophthora cinnamomi*). The preparation of a CEMP will outline how the Proposal will adhere to both the Biosecurity Act and the local strategic weed management plan.

Priority weeds observed on site are described in Appendix B.

3.2.12. Local Land Services Act 2013 (LLS Act)

The *Local Land Services Act 2013* (LLS Act) includes the management of natural resources in the consideration of the principles of Ecologically Sustainable Development (ESD).

Vegetation clearing provisions are considered under Part 5A of the LLS Act. The 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 17/11/22) verifies that the study area occurs on land mapped as both unmarked/unclassified and Category 2 - Vulnerable Regulated Land (steep or highly erodible land, protected riparian or special category).

3.2.13. Local Land Services Amendment Act 2016 (LLSA Act)

The *Local Land Services Amendment Act 2016* (LLSA Act), which amended the *Local Land Services Act 2013*, authorised the making of the Land Management (Native Vegetation) Code 2018 (Div 5, Sch 1 of

the LLSA Act). The aim of the Code is to authorise clearing of native vegetation on Category 2 regulated land under certain conditions and provide for the establishment and maintenance of set aside areas.

A review of the Transitional Native Vegetation Regulatory map (report generated 17/11/22) confirmed that the study area occurs on land mapped as both unmarked/unclassified and Category 2 – vulnerable regulated land. However, under Division 3, 60O Clearing is authorised under Division 5.1 of Part 5 of the EP&A Act. Therefore, this has not been considered further within this report.

3.2.14. Roads Act 1993

The Roads Act regulates the use and management of public roads. Section 138 of the Roads Act requires that consent of the appropriate Roads Authority is obtained for certain work undertaken in, on or over a public road. Under Section 138 of the Roads Act:

> (1) A person must not—
>
> (a) Erect a structure or carry out a work in, on or over a public road, or
> (b) Dig up or disturb the surface of a public road, or
> (c) Remove or interfere with a structure, work or tree on a public road, or
> (d) Pump water into a public road from any land adjoining the road, or
> (e) Connect a road (whether public or private) to a classified road,

Other than with the consent of the appropriate roads authority.

> (2) A consent may not be given with respect to a classified road except with the concurrence of Transport for New South Wales (TfNSW).

Pertaining to the above, Council is the appropriate Roads authority for all of the road section within the subject site and will provide the necessary permits to the contractors prior to work commencing, as required.

The proposed temporary diversion around the Wolgan Road will not impact any gazetted roads, therefore no TfNSW roads will be impacted as part of this proposal.

3.2.15. Crown Land Management Act 2016

The objectives of the Crown Land Management Act 2016 are:

(a) To provide for the ownership, use and management of the Crown Land of NSW, and
(b) To provide clarity concerning the law applicable to Crown Land, and
(c) To require environmental, social, cultural heritage and economic considerations to be taken into account in decision-making about Crown Land, and
(d) To provide for the consistent, efficient, fair and transparent management of Crown Land for the benefit of the people of New South Wales, and
(e) To facilitate the use of Crown land by the Aboriginal people of New South Wales because of the spiritual, social, cultural and economic importance of land to Aboriginal people and, where appropriate, to enable the co-management of dedicated or reserved Crown land, and
(f) To provide for the management of Crown land having regard to the principles of Crown land management.

Where Crown land is utilised as part of the proposed works, the project proponent must, within 12 months of project approval, obtain a license or lease of easement over Crown land in accordance with the CL Act.

Crown Land will be impacted as part of the proposed works, Council is therefore obliged to obtain a Licence or lease of easement over the impacted Crown Land.

3.2.16. Rural Fires Act 1997 (RF Act)

The RF Act came into force in 1997 to establish the NSW RFS and define its functions; to make provisions for the prevention, mitigation and suppression of rural fires; to repeal the Bush Fires Act 1949; to amend certain other Acts; and for other purposes. The objectives of this Act are to provide:

(a) For the prevention, mitigation and suppression of bush and other fires in local government areas and other parts of the State.
(b) For the co-ordination of bush firefighting and bush fire prevention throughout the State, and
(c) For the protection of persons from injury or death, and property from damage, arising from fires, and
(d) For the protection of infrastructure and environmental, economic, cultural, agricultural and community assets from damage arising from fires, and
(e) For the protection of the environment by requiring certain activities referred to in paragraphs (a)–(c1) to be carried out having regard to the principles of ecologically sustainable development described in section 6 (2) of the Protection of the Environment Administration Act 1991.

Section 63(1) and 63(2) of the RF Act stipulate it is the duty of a public authority to take all practicable steps to prevent the occurrence of bush fires on, and to minimise the danger of the spread of a bushfire on or from any land vested in or under its control or management.

The study area is mapped as being within a designated bush fire prone area.

3.2.17. 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 Division 5.1 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 1.8. The Likelihood of Occurrence Assessment concluded that the risk of impact to this species as a result of the proposed works is Likely – Recent records of the Koala exist within the locality and suitable habitat occurs within the subject site, furthermore, moderate clearing of the suitable habitat will occur, therefore a Test of Significance has been completed for the Koala.

3.2.18. Policy and guidelines for fish habitat conservation and management (NSW DPI 2013)

The Policy and Guidelines for Fish Habitat Conservation and Management (2013) provides classification of Key Fish Habitats based on the characteristics of the waterway present. Key Fish Habitats are further categorised according to 'sensitivity', with Type 1 containing Highly Sensitive habitat, Type 2 containing Moderately Sensitive habitats and Type 3 containing Minimally Sensitive habitats.

Five (5) mapped waterways intersect the proposed study area. Two (2) of the mapped waterways are mapped as 1st order, two (2) are mapped as 2nd order, and one (1) is mapped as 3rd order and identified as having key fish habitat. At the time of the field surveys, all 2nd and 3rd order waterways contained water. Moving water was also observed in locations not mapped as waterways following heavy rainfall events in the days preceding the site visit .

Table 6 Key Fish Habitat Waterway Classifications (NSW DPI 2013)

Classification	Characteristics of Waterway
Class 1 Major Key Fish Habitat	Marine or estuarine waterway or permanently flowing or flooded freshwater waterway (e.g., river or major creek), habitat of a threatened or protected fish species or 'critical habitat'.
Class 2 Moderate Key Fish Habitat	Non-permanently flowing (intermittent) stream, creek or waterway (generally named) with clearly defined bed and banks with semi-permanent to permanent waters in pools or in connected wetlands areas. Freshwater aquatic vegetation is present. Type 1 and 2 habitats present.
Class 3 Minimal Key Fish Habitat	Named or unnamed waterway with intermittent flow and sporadic refuge, breeding or feeding areas for aquatic fauna (e.g. fish, yabbies). Semi-permanent pools form within the waterway or adjacent wetlands after a rain event. Otherwise, any minor waterway that interconnects with wetlands or other Class 1-3 fish habitats.
Class 4 Unlikely Key Fish Habitat	Waterway (generally unnamed) with intermittent flow following rain events only, little or no defined drainage channel, little or no flow or free-standing water or pools post rain events (e.g. dry gullies or shallow floodplain depressions with no aquatic flora present).

Table 7 Mapped Waterways Within the Study Area

Stream Order	Number within study area
1st Order	2
2nd Order	2
3rd Order	1
4th Order or higher	0
Total Waterways intersecting the site	**5**

The works involve interaction with a number of waterways, all of which are unnamed 1st, 2nd and 3rd order streams. There is one unnamed creek mapped as containing Key Fish Habitat (KFH) within the north of the study area, within the Hawkesbury Nepean catchment (Figure 6).

3.2.19. Managing Urban Stormwater: Soils and Conservation

The document *Managing Urban Stormwater: Soils and Construction – Volume 1* (Landcom 2004 "The Blue Book") outlines the basic principles for the design and construction of erosion and sediment (ERSED) control measures. Volume 1 – *Soils and Construction* and Volume 2A – *Installation of services* provide additional guidance for the management of water on construction sites.

These documents are relevant to the proposed development, as they provide guidance on the configuration of ERSED controls required during the trail construction and commissioning phases. Standard drawings will be included within the CEMP as relevant.

3.3. Community and agency consultation

3.3.1. Stakeholder consultation

Communications with landholders and other affected parties have been undertaken by officers from the NSW Western Area Health Services and Council's Community Resilience Officer. Community meetings have been held regarding this issue on

- 15th November 2022
- 22nd November 2022
- 29th November 2022
- Continuing weekly on Tuesdays thereafter.

Council will continue to liaise with its agency stakeholders and members of the wider community throughout delivery of the construction and operational phases of the Proposal.

LCC will ensure all interested and affected parties including businesses, government agencies, farming enterprises, landowners and residents within the impacted area are notified of the works at least fourteen (14) days prior to commencement, and regular door to door verbal notifications will be given to affected landowners prior to works proceeding adjacent to their property.

There are no driveways or access ways directly within the study area, there are however driveways to private properties within 500 m of the study are at both the north and south ends of the proposal location.

3.3.2. Private landowner consent

It is noted in Section 1.1 of this REF that as the proposed works are appropriately characterised as development under the Transport and Infrastructure SEPP (TISEPP), the provisions of TISEPP apply. Therefore, the Proposal can be undertaken as an activity under Division 5.1 of Part 5 of the EP&A Act, through provision of this REF and subsequent determination by Council, and does not require further consent.

Given this, there is no requirement to seek consent from private landowners for the acquisition of land; additionally, while the Proposal is to be undertaken on land within the road reserve (Council-owned land) and land acquisition is not required. However, observations during the site visit (17/11/2022) determined it will be difficult to maintain the route through the road reserve, and private properties are likely to be impacted by way of the Proposal. Council intends to continue to liaise with any landholders with potential to be impacted by the works to ensure adequate engagement is undertaken, and, where appropriate, rectification works are completed.

3.3.3. Mitigation of impacts during construction and operation

The assessment completed within this REF has concluded that socio-economic impacts are expected to be minimal, confined to the construction phase and are not likely to significantly negatively affect residents in proximity to the Proposal.

As noted in 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 additional ongoing significant environmental or community impacts.

Given this conclusion, the likely impacts on surrounding residents are anticipated to be limited to the construction period. The CEMP will list the responsibility of LCC and any appointed Contractor(s) to develop and distribute notification to local residents before, during and after the construction period. Given the emergency situation and ongoing consultation and community meetings, the adequate notification period for residents is seven (7) days prior to works commencement.

Table 8 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	Advertisement in local papers (Lithgow Mercury), social media and Council website advising of changed traffic conditions and delivery of construction loads.
Working hours	Local residents	Letterbox drop and / or door-knock of notification listing working hours, and measures to manage local impacts; lighting, truck deliveries and noise onsite

3.3.4. Agency consultation and concurrent requirements

It is understood that Council and NSW Western Area Health Services will be undertaking stakeholder engagement and community consultation activities internally, as per the community consultation plan.

TEF will consult with DPI Fisheries to obtain the necessary Fisheries Permit to allow for works within the bed and banks of the 3rd order stream that intersects the site.

3.3.5. Requirement for public display of REF

As per the EP&A Regulations, determining authorities must keep the REF documentation including any appendices or addenda and make available for public access once a determination has been made. The EP&A Regulation Clause 171(4) requires the REF to be published on the determining authority's website or the NSW Planning Portal for an 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, 201, 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 be in 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.

4. ENVIRONMENTAL ASSESSMENT

This chapter describes the potential key environmental impacts associated with the Proposal during both construction and operation and includes site-specific Environmental Safeguards to ameliorate any potential impacts identified. A summary of the Environmental Safeguards has been provided as Appendix D.

4.1. Soils and Erosion

4.1.1. Existing environment

Due to the frequent rains across the region, vegetative cover was generally good throughout the study area, with soils in varying degrees of stability at the time of the site visit. The substrate was observed to be mostly sedimentary with numerous sandstone outcrops noted. A site visit on November 17th 2022 determined the site to have several very wet areas, with water moving along the previously cut track creating rill erosion / runnels. This may present a risk to both environment and humans due to the stability of the site and risk of water pollution from construction works. The southern section in particular was noted as being particularly steep, which may be problematic with regard to stability; this section of the Proposal is constrained by a steep drop off to one side and observed as having moving surface water and springs present during the site visit.

Mitchell Landscape Soils

Newnes Plateau is mapped as the dominant landscape soil type throughout the site, with the northern portion of the study area mapped as Capertee Plateau landscape soil type (Figure 3).

The Newnes Plateau landscape is characterised by undulating high level plateau with shallowly incices swampy streams on horizontal Triassic quartz sandstones and shale, general elevation 1000m. Thin stony yellow red sands, deep yellow earths, podsols on dunes and yellow or grey texture-contrast soils on shale units. Woodland of stunted scribbly gum (*E. sclerophylla*), snow gum (*E. pauciflora*), Blue Mountains ash (*E. oreadeas*), silver top ash (*E. sieberi*), grey ironbark (*E. paniculate*), red bloodwood (*Corymbia gummifera*) and grass trees (*Xanthorrhoea* sp,) with numerous other shrubs. Patches of dwarf casuarina (*Allocasuarina nana*) heath on very exposed and eroded aspects, sedge swamps with marginal heath form linear patterns in open valleys.

The Capertee Plateau landscape is characterized as having wide valleys and low rolling hills below sandstone cliffs at a general elevation of 800 – 1000 m. Isolated flat top mountains and shoulder slopes with stone pillars with low gradient swampy streamlines are features of this landscape. The Wolgan Valley is fringed by a Narrabeen Group rock escarpment which is known for having stability issues. Soils are shallow with stony texture contrast profiles, usually with gritty well drained 'A horizons' over tough yellow or grey poorly drained clays (Mitchell, 2002).

Acid Sulphate Soils

Cq(p4) acid sulphate soils (ASS) occur throughout the study area, with a subordinate section of Bn(p4) mapped as occurring in the south of the study area. 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, 2020). The site is mapped as Cq(p4) – extremely low probability of occurrence (1-5%), and Bn(p4) – low probability of occurrence (6-70%).

ASS generally have extremely low probability of occurrence based on mapped soil types and geological formations but with little actual data to support this (very low confidence in the data).

Australian Soil Classification

Figure 5 shows the Australian Soil Classification (ASC, 2020) within 5 km of the study area. Kurosols, and Rudosols and Tenosols make up the subject site. Kurosols are soils with a strong texture contrast between 'A horizons' and strongly acid 'B horizons'. Many of these soils also have some unusual chemical features such as high Mg, Na or Al (ASC, 2018). Rudosols and Tenosols are generally shallow and stony and although poorly developed are widespread. These two soil orders also have low water holding capacity and fertility (Qld Government, 2018).

4.1.2. Potential Soils and Erosion Impacts – Construction

Disturbance of the ground to accommodate the construction of the emergency access road increases the risk of erosion, and subsequent sediment migration across the landscape. The duration and intensity of rainfall during and after 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 construction phase. There is potential for erosion if work sites are left exposed for long periods of time without adequate safety 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

There is the potential for the operation of the emergency bypass road to increase ongoing risks to the environment caused by erosion and sediment runoff following construction. Throughout the operation of the Proposal, regular road checks will be required to ensure erosion and sediment controls are holding. Where sediment runoff is noted, this must be ameliorated immediately. Unseasonably heavy rainfalls are predicted to continue into 2023 due to complex La Nina weather patterns, increasing the risk of surface water impacts including increased runoff. The environmental safeguards listed in Section 4.1.4 must be adhered to throughout the operational phase of the Proposal to minimise risk to both human life and environment.

Table 9 Soils and Erosion impacts summary table

Description	Y	N	Comments
Are there any known occurrences of salinity or acid sulfate soils in the area?	X		Yes, see Figure 4. The site is mapped as Cq(p4) – extremely low probability of occurrence although very low confidence in data available.
Does the project involve the disturbance of large areas (e.g. >2 ha) for earthworks?		X	Vegetation clearing of groundcover along road alignment of 2.16 km length adjacent to Wolgan Road. 1.3 ha of disturbance.
Does the site have constraints for erosion and sedimentation controls such as steep gradients, narrow corridors or is located on private property?	X		Yes – narrow impact corridor, steep gradients, located on crown and private property

Plate 1 Examples of rill erosion and moving water present on existing track

4.1.4. Environmental Safeguards – Soils and Erosion

The Environmental Safeguards for Soils and Erosion are considered part of the Wolgan Road Emergency Bypass Project and must be implemented.

Safeguards to be implemented and maintained for Soils and Erosion include:

Construction

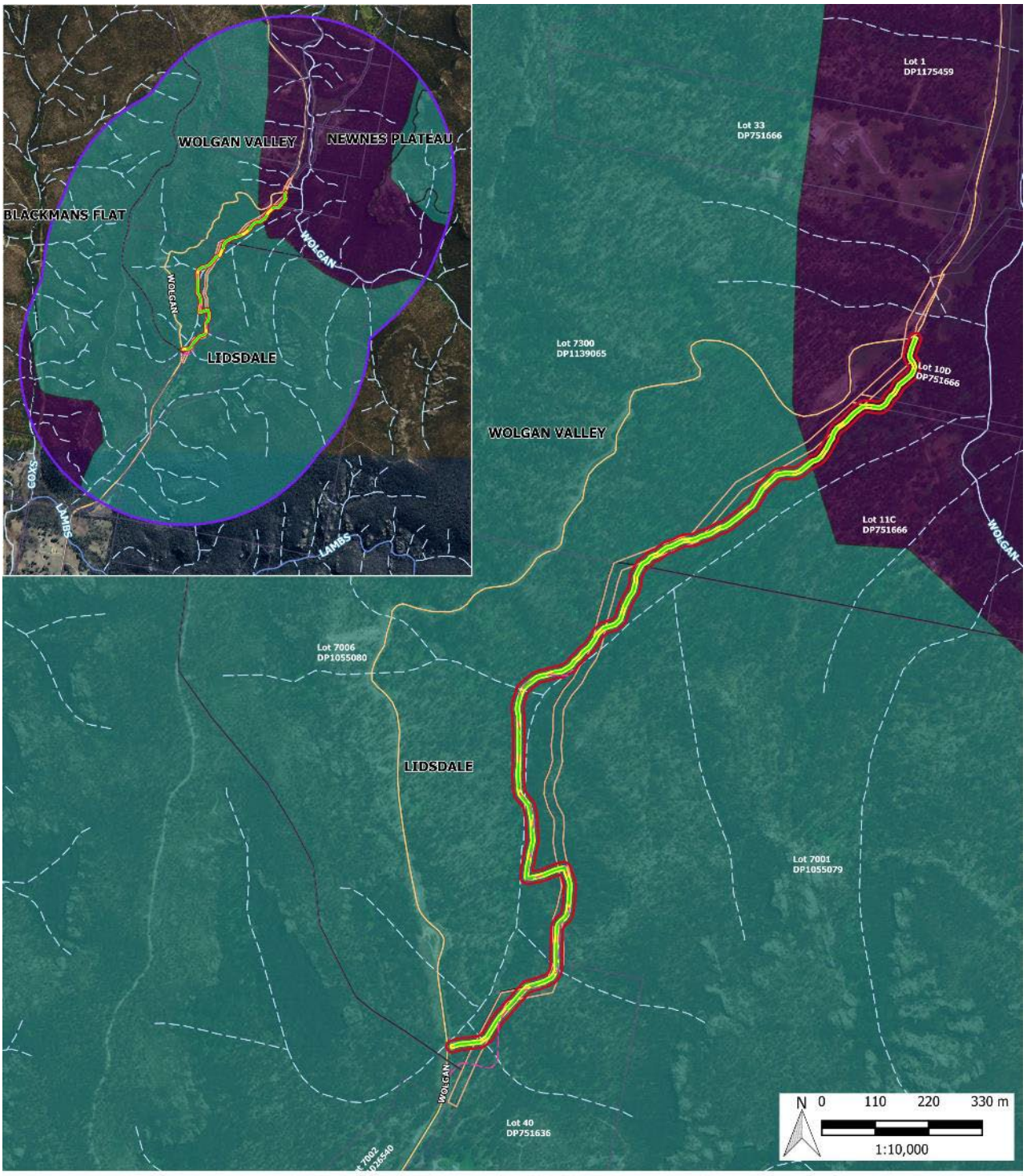
- No vegetation outside the approved direct impact footprint is to be harmed or removed; native vegetation that is not approved for clearance is to be protected to ensure soils are not exposed unnecessarily.
- All areas where groundcovers / vegetation are required to be removed will require careful management 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 water course, drainage lines, or drain inlets, 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.
- Stockpiles and machine parking will be on private property or in existing cleared areas along the road reserve, to reduce impacts to ground covers and adjacent vegetation from sediment migration.

- Monitoring and response actions with regards to ERSED controls will need to be incorporated within the Construction Environmental Management Plan (CEMP) and Environmental Control Plan (ECP) for the project.
- Vehicles are to use existing roadways and formed access where possible to prevent additional damage to the site, and to reduce the risk of tracking of sediments offsite.
- Works areas are to be stabilised using the most appropriate combination of the following measures, as soon as possible following disturbance:
  - Planting of native tubestock to replace removed large trees and other woody vegetation.
  - Hydromulching, turfing or seeding with appropriate species on exposed areas including over concrete paved sections of trail; and / or
  - Sealing exposed areas with appropriate material, e.g. concrete emulsion, road base or asphalt.
- Sediment fences / strawbale filters or equivalent must 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). Including:
  - Stockpiles are recommended to be formed in accordance with the Blue Book Standard Drawing 4-1, and offsite/outside the riparian zone 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 stabilisation works, e.g. re-spreading of topsoil 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 / stabilisation 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 ground-cover mixture and/or mulch to be undertaken by Council during the 12-month establishment period until the planting areas are stabilized. Infill planting and maintenance will then be handed over to Council to ensure long-term stability of the site.

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



Wolgan Road Emergency Bypass - Mitchell Landscape Soils within a 1.5km Radius of the Proposal Location

Legend

- 1.5km Radius
- Study Area
- Subject Site
- Proposed Diversion Alignment
- Optic Fibre Alignment
- Existing Road Corridor
- Suburb
- Lot Boundary

Roads

- Sub Arterial Road

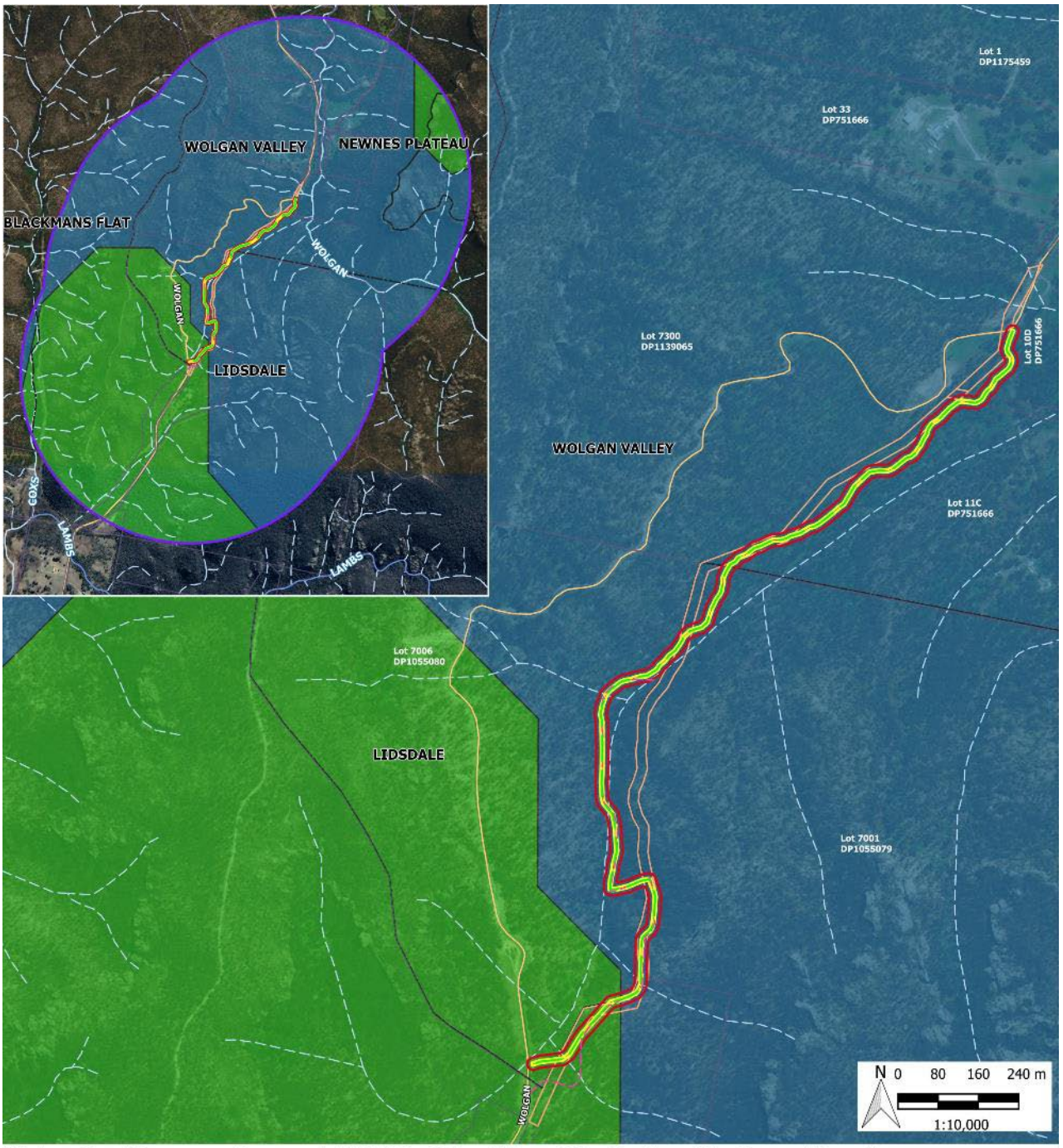
Waterway

- River
- 1st and 2nd order unnamed waterways

Mitchell Landscapes Soils

- Capertee Plateau
- Newnes Plateau

Figure 3 Mitchell Soil Landscapes occurring within 5km of the study area



Wolgan Road Emergency Bypass - Acid Sulfate Soils within a 1.5km Radius of the Proposal Location

Legend

- 1.5km Radius
- Study Area
- Subject Site
- Proposed Diversion Alignment
- Optic Fibre Alignment
- Existing Road Corridor
- Suburb
- Lot Boundary

Roads

- Sub Arterial Road

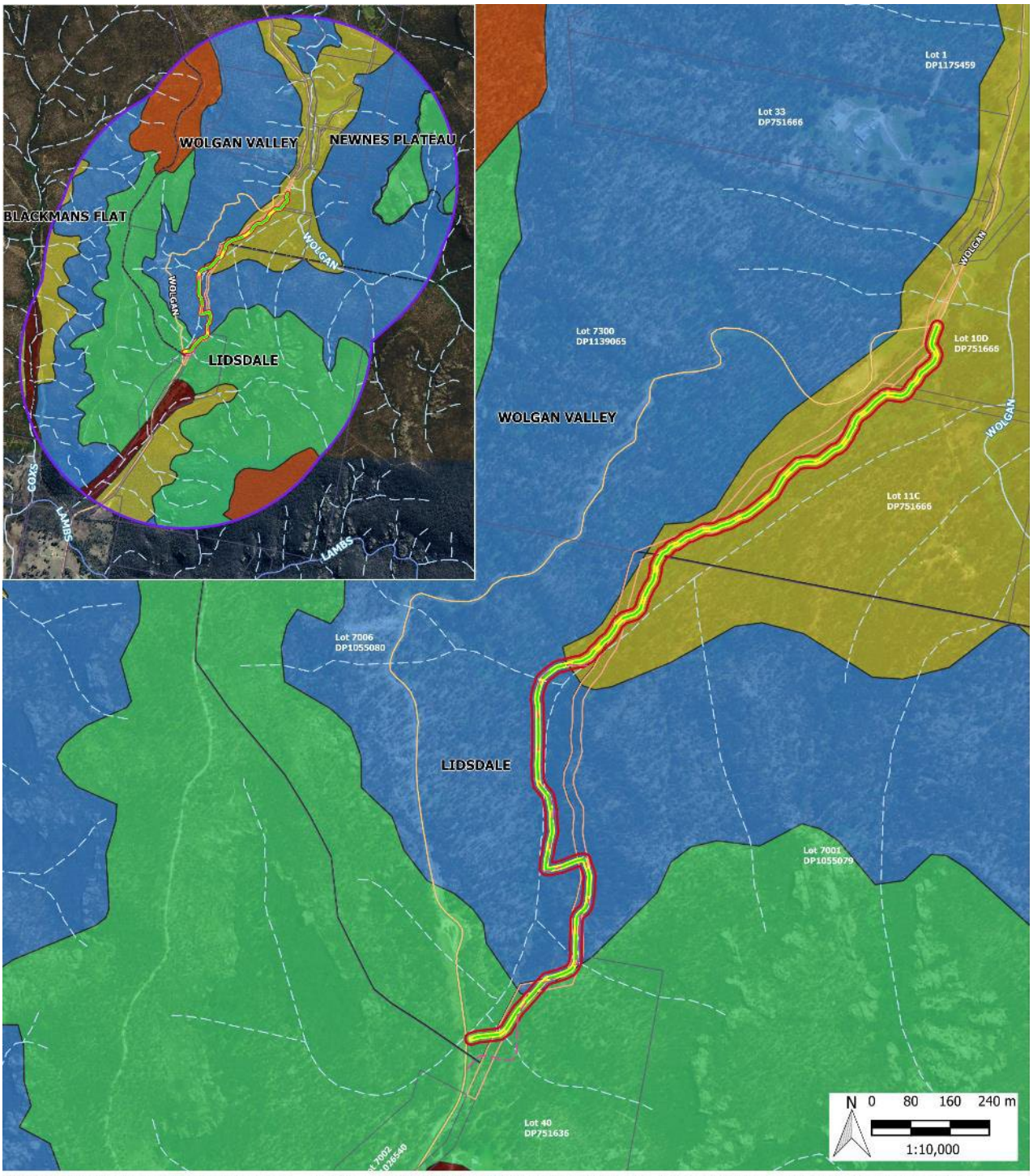
Waterway

- River
- 1st and 2nd order unnamed waterways

Acid Sulfate Soils

- Bn(p4) - Low Probabilty of occurrence (6-70%) ASS in inland lakes, waterways, wetlands and riparian zones with Sodosols, Chromosols and Dermosols (Isbell 1996)
- Cq(p4) - Extremely Low Probability of occurence (1-5%) ASS in inland lakes, waterways, wetlands and riparian zones with Kandosols, Ferrosols, Tenosols, Rudosols and Podosols (Isbell 1996)

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



Wolgan Road Emergency Bypass - Australian Soil Classifications within a 1.5km Radius of the Proposal Location

Legend

- 1.5km Radius
- Study Area
- Subject Site
- Proposed Diversion Alignment
- Optic Fibre Alignment
- Existing Road Corridor
- Suburb
- Lot Boundary

Roads

- Sub Arterial Road

Waterway

- River
- 1st and 2nd order unnamed waterways

Australian Soil Classifications

- Hydrosols
- Kandosols
- Kurosols
- Rudosols
- Rudosols and Tenosols

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

4.2. Surface and Groundwater

4.2.1. Existing environment

The proposed works are situated approximately 100 m to the west of the Wolgan River, and intersects several tributaries along the alignment. The Wolgan River is a watercourse of the Hawkesbury-Nepean catchment (Hawksbury-Nepean - Water in New South Wales (nsw.gov.au)), located in the Central Tablelands region of NSW. The western and eastern branches of the Wolgan River converge northeast of Wallerawang near Lithgow, on the eastern slopes of the Great Dividing Range. The Wolgan River spans over 63 km and descends 897 metres in its course before reaching its confluence with the Capertee River below Mount Morgan east of Glen Davis. Most of the river lies within Wollemi National Park and flows through the Wolgan Valley, where it interacts immediately to the east of the study area.

There is one unnamed 3rd Order waterway mapped as supporting KFH within the subject site; this waterway feeds into the Wolgan River, which is mapped as a 4th order waterway (using the Strahler method 1 : 25,000 topo) at the point of confluence. The study area is intersected by a further four (4) unnamed waterways.

No part of the study area is recorded as containing shallow groundwater that could be sensitive to earthworks and easily contaminated (Figure 6).

Plate 2 Existing culverts to the south of the study area, with moving water and growth in the channels

Plate 3 Existing waterways on site that intersect the subject land

4.2.2. Potential Surface and Groundwater Impacts – Construction

Potential impacts to downstream surface waters relate directly to erosion and increased sedimentation during construction, resulting in a reduction in water quality through turbidity for downstream aquatic environments. There is also the potential for spills of fuels and other contaminants arising from plant and machinery, which could enter surface waters during any works completed in proximity to drainage lines and waterways.

4.2.3. Potential Surface and Groundwater Impacts – Operation

If the emergency bypass trail is not maintained once operational, and stabilization measures are not effective or installed properly, the exposed soils of the trail could erode resulting in sediment migration into adjacent waterways. Additionally, there is potential for vehicles accessing the trail to leak fuels or other contaminants whilst traversing the alignment, resulting in pollution of water which is an offense under s120 of the POEO Act, though this risk is considered to be minor.

If ERSED measures and best practice design principles are adhered to, impacts to waterways as part of operation of the Wolgan Road emergency bypass project are anticipated to be negligible.

Table 10 Waterways impacts summary table

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,	X		Mapped waterways and drainage lines exist within the subject site and study area

Description	Y	N	Comments
lakes, lagoons and constructed waterways, and dams.			
Is a Fisheries Permit required? If the culvert construction works are within the Key Fish Habitat, Part 7 Fisheries Permits are automatically required for any third order (or higher) stream under the *Fisheries Management Act 1994* (FM Act).	X		No explosives or electrical devices will be used as part of the road upgrade proposal; however there is one waterway mapped as supporting Key Fish Habitat within the subject site, therefore a Part 7 Fisheries Permit is required.
Will the proposed works be undertaken on a bridge?		X	No bridge work included in the Proposal
Are the works likely to require the extraction of water from a local water source (not mains)?		X	A water cart may be required to dampen soils during construction activities; water would be transported to site from an approved Council source.
Is the site identified as High or Moderate Groundwater Vulnerability?		X	No part of the study area is recorded as containing shallow groundwater that could be sensitive to earthworks and easily contaminated
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 and sediment migration off-site. Implementation of Environmental Safeguards would reduce the risk of this occurring.

4.2.4. Environmental Safeguards – Surface and Groundwater

The Environmental Safeguards for Surface and Groundwater are considered part of the Wolgan Road Emergency Bypass Project and must be implemented.

Safeguards to be implemented and maintained for Surface and Ground waters include:

Construction

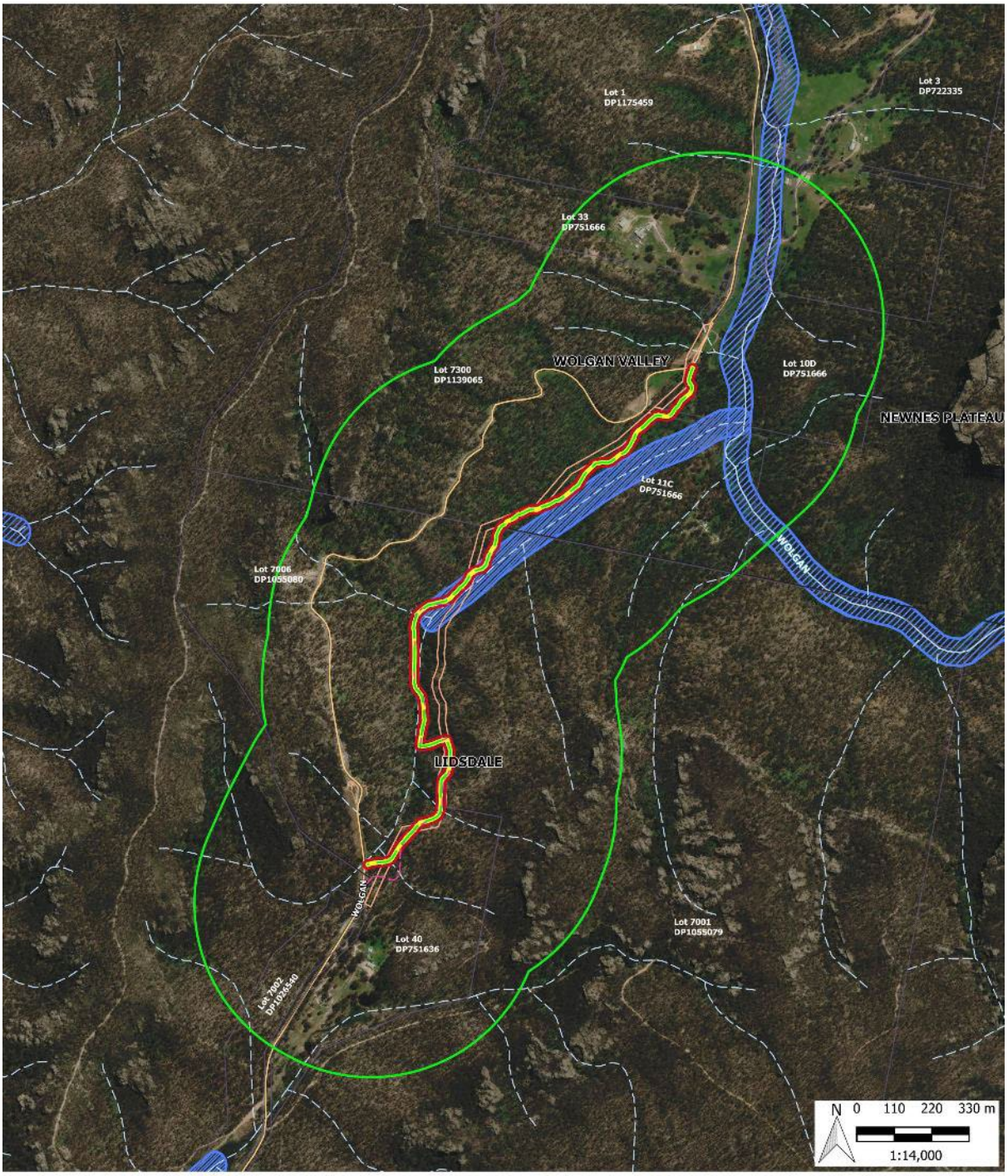
- If 'dirty' site water is collected from within the direct impact footprint, it is to be redirected to filtration devices to trap sediments and other pollutants, and dissipate flow velocities, prior to discharging to the surrounding environment. Drainage and runoff should be controlled in such a way 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.
- Works to be completed in dry times whenever possible (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 and drainage lines.
- All litter, including cigarette butts and food wrappers, is to be collected in a suitable receptacle and disposed of appropriately throughout the construction phase.

- Re-fueling 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. Portable spill kits and secure couplings may be used to refuel machinery if needed in less accessible parts of the site to ensure pollutants are not left to wash downstream and impact aquatic environments.
- Vehicle wash-down and/or cement truck washout (if required) is to occur offsite, where it is to occur in a suitably bunded area with controlled run-off.
- Visual 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, coir logs and holding ponds to prevent stockpile runoff from entering waterways.
- Minimise 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 or 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).
    - 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 project, detailing:
    - Water quality parameters to be adhered to
    - Appropriate monitoring locations and frequency
    - Location and types of ERSED controls
    - Proposed revegetation and stabilisation measures to be undertaken
    - Stockpile management provisions.

Operation

- Continue to undertake a water quality and quantity monitoring program in line with Council's requirements until the site is completely stabilised; monitoring should include details of proposed baseline and downstream water quality following any heavy rainfall.
- Subject site rehabilitation, including removal of weeds and subsequent revegetation using appropriate native species, to be undertaken to ensure soil stability and prevention of sediment runoff from the site into the future.

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



Wolgan Road Emergency Bypass - Waterways and Key Fish Habitat within a 500m Radius of the Proposal Location

Legend

- 500m Radius
- Study Area
- Subject Site
- Proposed Diversion Alignment
- Alternate Route
- Existing Road Corridor
- Suburb
- Lot Boundary

Roads

- Sub Arterial Road

Waterway

- River
- 1st and 2nd order unnamed waterways
- Key Fish Habitat

Figure 6 Waterways and KFH within 500 m of the Subject site

4.3. Noise and Vibration

4.3.1. Existing environment

The study area is located in a landscape that is relatively isolated from human activity, and experiences little anthropogenic sounds with the exception of the occasional vehicle passing through or the use of agricultural equipment such as tractors on adjacent farmland. Usually local traffic and vehicles travelling to the Emirates Resort and other tourist attractions (e.g. the Glow Worm tunnel and Wollemi National Park) to the north would be responsible for most of the anthropogenic noise in this section of the valley. With the closure of the Wolgan Road at present, there is very little anthropogenic noise outside of construction activities on the road itself.

Wildlife (especially birds and frogs), livestock, river flow and inclement meteorological conditions (rain and wind) were observed to constitute most of the noise occurring on site; running water was particularly loud in proximity to the waterways on site, likely due to recent heavy rains. There are two (2) private residences identified within 500 m of the study area, including 'Kurraco Ridge' located approximately 300 m from the subject site, and an unnamed property approximately 160 m to the south of the study area (refer Figure 7).

No noise surveys have been completed for this proposal and observations are qualitative only.

4.3.2. Potential Noise and Vibration Impacts – Construction

Noise impacts during construction are anticipated to arise from increased heavy vehicle and plant movements; vegetation clearing and grubbing, including felling of trees as required; excavators and other mechanical equipment including general engine noise and reverse alert beepers are expected as part of the construction phase. However, due to the rural location of the site, proximity of local residences, these noise impacts are unlikely to cause significant disruption or constitute intrusive noise. Native species that are nesting, breeding or fledging are at risk of disruption by the noise and vibration generated by the proposal.

Given the urgency of the project, ongoing consultation with neighbouring property and other stakeholders, and low density of sensitive receivers within proximity to the subject site, Council is proposing extending construction hours beyond the parameters identified in the Interim Construction Noise Guideline (ICNG) (Department of Energy and Climate Change (DECC) 2009).

LCC propose extending construction hours to **7am – 7pm**, seven (7) days per week, which may cause additional impacts to native biota.

4.3.3. Potential Noise and Vibration Impacts – Operation

The Wolgan Road emergency bypass is not anticipated to generate significant additional noise or vibration during the operational phase. It is anticipated that the low levels of traffic using the bypass will generate noise disturbance to native species living along the trail alignment, however this is expected to be minor and associated with light 4WD vehicles only.

Table 11 Noise and Vibration impacts summary table

Description	Y	N	Comments
Are there any noise sensitive areas near the location of the proposed works	X		There are two (2) private properties within 500m of the proposal location

Description	Y	N	Comments
i.e. < 500m at nearest point, that may be affected by the works e.g. church, school, hospital, residences			
Are the proposed works going to be undertaken during standard working hours detailed below? **Monday – Friday:** 7:00am to 6:00pm **Saturday:** 8:00am to 1:00pm **Sunday and Public Holidays:** No work		X	Proposed construction hours are as follows: □ 7am – 7pm Monday to Friday
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 road widening will generate ongoing operational noise, however, not in addition to the current level of operational noise of Wolgan Road

4.3.4. Environmental Safeguards – Noise and Vibration

The Environmental Safeguards for Noise and Vibration are considered part of the Wolgan Road Emergency Bypass Project and must be implemented.

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)
- Typically, noise impacts to the local community will be limited to recommended standard working hours as detailed in the Interim Construction Noise Guideline 2009 (ICNG) where possible. However, due to the urgent nature of the works, 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 7:00pm 7 days per week,
  No work on Public Holidays

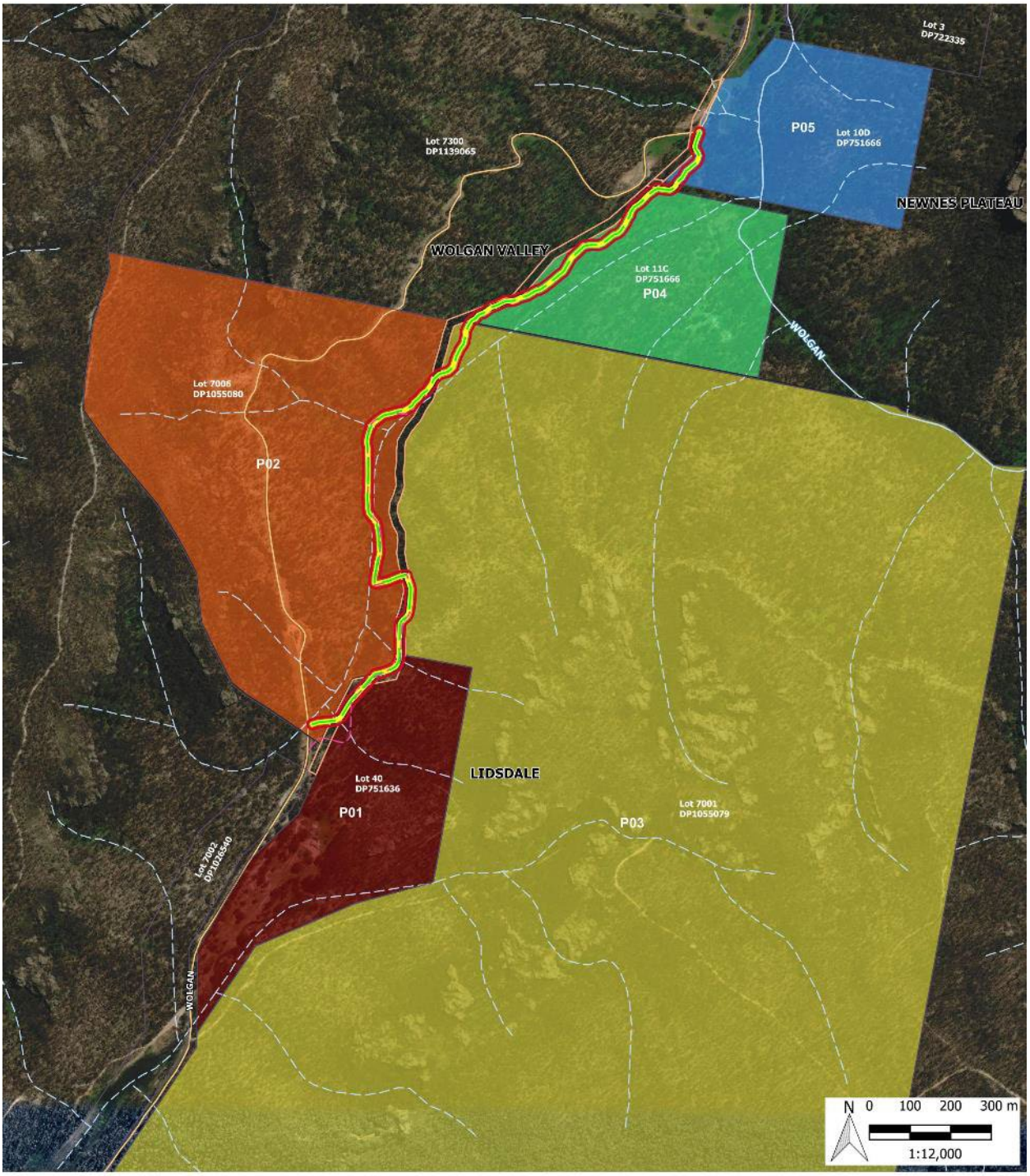
- Nearby residents that have the potential to be impacted as part of works, should be notified of the proposed construction no less than one (1) week prior to works starting.
  Communication must inform residents of planned construction activities, time periods and expected durations, potential impacts, proposed mitigation measures and contact details of site management.
- Communication of intentions and timeframes will be made to neighbouring properties to minimise misconceptions, uncertainty and negative reactions to noise. The site supervisor should supply a contact number to aid in community liaison.
- All noise and vibration complaints are to be handled in a timely manner and monitoring is to be implemented in response to any complaints received.

- The appointed contractor will incorporate Noise and Vibration Management strategies in the CEMP and throughout project delivery, 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) as applicable.
- Plant deliveries and site access will occur quietly and efficiently, with parking allowed only within designated areas located away from nearby sensitive receivers and private property.
- Simultaneous operation of high-level noise generating machinery should be avoided where possible by operating at contrasting times or increasing the distance between the plant and the nearest identified receiver, including identified nesting native species.
- High noise generating activities, such as jack hammering, should be carried out in continuous blocks, not exceeding three (3) hours with a minimum respite period between blocks of one (1) 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, except by prior arrangement.
- Contractors and project managers to make reasonable efforts to time works to avoid and/or minimise noise impacts during prime breeding season (Spring) for the majority of native species residing in the area which may be sensitive to noise and vibration during breeding and fledging.
- Strong community reaction may occur where the noise levels reach 75 dB, known as the highly noise affected level. If this level is reached, respite periods may be enforced, and community consultation is to occur to determine least sensitive periods and/or if the community is prepared to accept a longer construction period in exchange for restrictions on construction times.

Operation

No further Safeguards were considered necessary for the operation phase of the project. Operation of the road is not likely to result in any significant ongoing noise impacts as use of the bypass road will be limited to light 4WD vehicles.

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



Wolgan Road Emergency Bypass - Properties Potentially Directly Impacted by the Proposal

Legend

- Study Area
- Subject Site
- Proposed Diversion Alignment
- Optic Fibre Alignment
- Existing Road Corridor
- Suburb
- Lot Boundary

Roads

- Sub Arterial Road

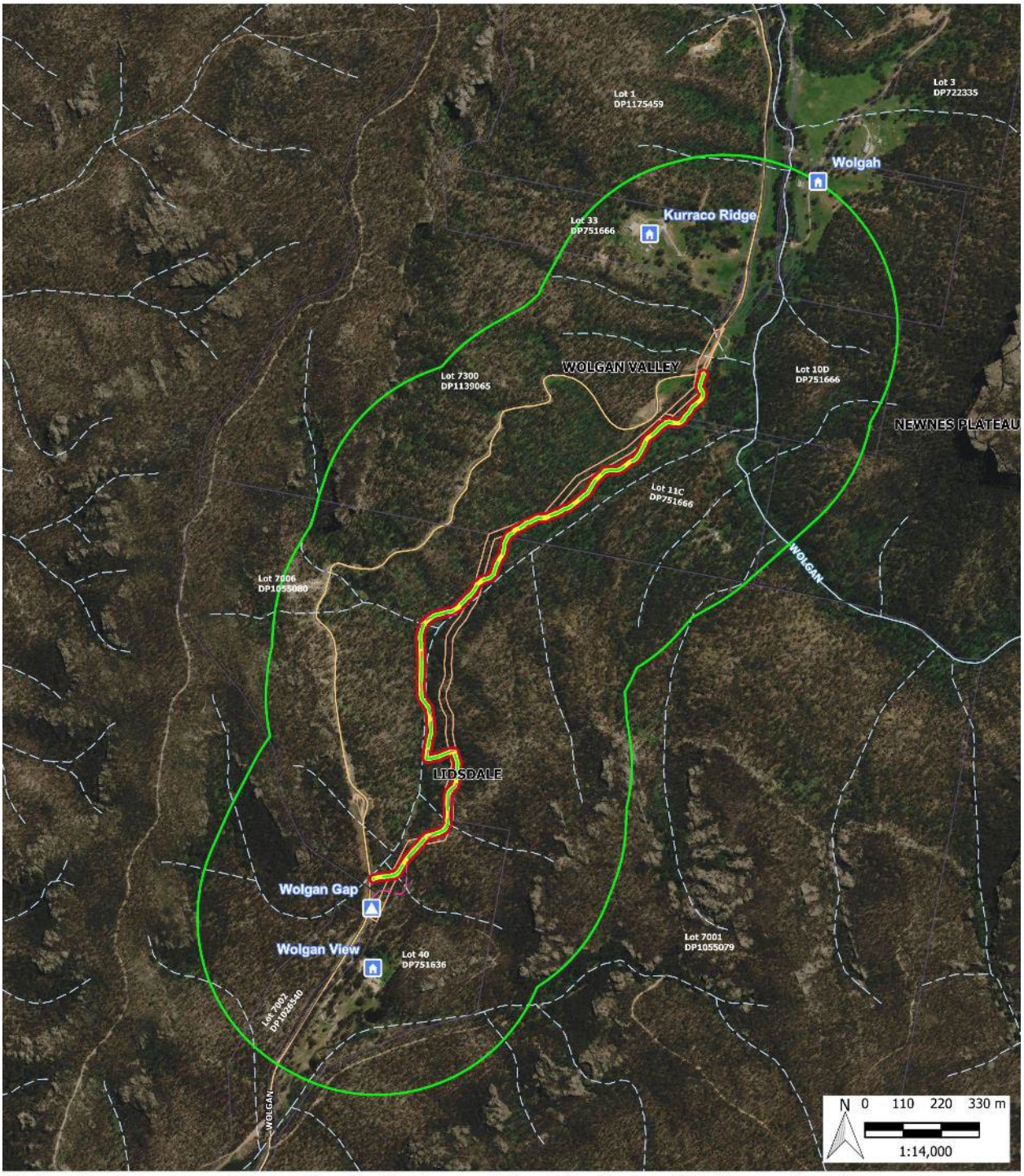
Waterway

- River
- 1st and 2nd order unnamed waterways

Properties Potentially Directly Impacted by the Proposal

- P01
- P02
- P03
- P04
- P05

Figure 7 Properties directly impacted by the Proposal



Wolgan Road Emergency Bypass - Senstive Receivers within a 500m Radius of the Proposal Location

Legend

- 500m Radius
- Study Area
- Subject Site
- Proposed Diversion Alignment
- Optic Fibre Alignment
- Existing Road Corridor
- Suburb
- Lot Boundary

Roads

- Sub Arterial Road

Waterway

- River
- 1st and 2nd order unnamed waterways

Senstive Receivers

- Gap / Pass / Saddle
- Homestead

Figure 8 Sensitive receivers in proximity to 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 Lithgow (Newnes Forest Centre), this weather station has however ceased operating. The Lithgow (Newnes Forest Centre) AWS is located approximately 10 km northeast of Wolgan Rd and records observations of a range of meteorological data including temperature, humidity and rainfall, wind speed and wind direction.

Temperature data recorded at the Newnes AWS indicates that January is the hottest month of the year, with a mean daily maximum temperature of 23.5°C. July is the coolest month with a mean daily maximum temperature of 9.4°C. January is the wettest month with an average rainfall of 121.0 mm falling over 10.6 days. According to long-term records, there are on average 59 rain days per year, with a mean annual rainfall of approximately 1092 mm.

Short-term meteorological data was obtained from the Lithgow AWS, located approximately 12km to the south of the subject site. Weather conditions recorded at the Lithgow AWS on the 17th of November were warm and dry with a minimum of 0.5 degrees and a maximum of 16 degrees. Two (2) millimeters of rain was recorded at the Lithgow weather station, however no rain was observed during the site visit (Table 12). Long-term meteorological data is not available from the Lithgow AWS.

Table 12 Weather conditions preceding, during and following field surveys (weather station: 063226)

Date	Temperature (˚C)		Rain (mm)	9am Wind Speed	
	Minimum	Maximum		Speed km/hr	Direction
12/11/2021	8.2	23.4	1.2	-	-
13/11/2022	10.4	20.3	1.6	9	N
14/11/2022	12.5	17.9	73.0	13	W
15/11/2022	9.9	16.9	0	6	SW
16/11/2022	5.0	10	0	7	SW
17/11/2022	0.5	16	2	6	SW
18/11/2021	4.3	18.6	0	4	SE
19/11/2022	6.0	22.3	0	7	SW
20/11/2022	12.7	16.6	5.4	19	W

The Wolgan Valley, Glen Davis, Capertee 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 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 rural roads with high silt loadings
- Diesel and petrol fuel combustion emissions from road and non-road sources
- Seasonal emissions from household wood burning

- Episodic emissions from dust storms and vegetation fires (local and regional)Emissions from the Mt Piper Power Station (directly approx. 20 km away, or ~ 28 km by road).

4.4.2. Potential Air Quality Impacts – Construction

Potential impacts to air quality may arise from airborne dust particles generated during vegetation clearing, earthworks, stockpiling and managing topsoil, transport and handling of soils and equipment, as well as the use of construction vehicles 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.

Table 13 Air Quality impacts summary table

Description	Y	N	Comments
Are the proposed works likely to result in large areas (>2ha) of exposed soils?		X	It is anticipated approximately 1.3 ha of vegetation will require removal to construct the road
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 (2) residence 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; the study area and locality contain fine, friable soils likely to result in dust emissions once disturbed

4.4.3. Potential Air Quality Impacts – Operation

Some minor impacts to air quality are expected as part of operation of the unsealed temporary road.

4.4.4. Environmental Safeguards – Air Quality

The Environmental Safeguards for Air Quality are considered part of the Wolgan Emergency Bypass Project and must be implemented.

Safeguards to be implemented and maintained for Air Quality include:

Construction

- Council must continue to undertake community engagement and liaison, to set expectations for the works schedule and likely air quality 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. Regular site inspections will be undertaken as part of air quality monitoring, and inspection results recorded by Council's Principal Contractor.
- Provide an adequate water supply on the construction site for effective dust / particulate matter suppression / mitigation; due to the steep and inaccessible nature of this site, this

may be via a water tank on a 4WD vehicle. If synthetic dust suppressants are used, they must be biodegradable in nature and non-toxic for waterways.

- Earthworks and exposed areas of soil are to be stabilised using compactible material or revegetated using appropriate native 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, such as leftover material at construction completion, through urban areas 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 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 Contractor's logbook.

Operation

- Council is to conduct regular road maintenance activities to ensure the road surface doesn't deteriorate, resulting in emissions to air.
- Any exposed areas revegetated during construction are to be monitored and maintained until the areas are fully stabilised to reduce risk of erosion and dust emissions, as well as dust settling on nearby native vegetation.

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

The Wolgan Valley is known to have been inhabited by indigenous Australians for thousands of years, with the first European settlement occurring around 1823 when the valley was used as an outstation for the Walker brothers' Wallerawang property "Wallerowang".

Figure 9 show the non-Aboriginal places of significance in the locality, however none of these are located within 1 km of the Proposal location. A popular tourist attraction with local historical significance is the glow worm tunnel, which is a disused railway line located approximately 11 km to the northeast of the study area. The location is a popular tourist attraction due to its resident glow-worms which are the bioluminescent larvae of *Arachnocampa richardsae* (Glow Worm Fly or Fungus Gnat). The 400 m tunnel was bored through the sandstone in 1907 to serve the Newnes oil shale mines that operated during the 20th Century. Closed in 1932, the tunnel now attracts bush walkers and tourists and is part of the Wollemi National Park.

A search of the Lithgow Local Environmental Plan (LEP) 2014 lists several other places/items of significance occurring within 10 km of the subject site including:

- Back Cullen Cemetery
- Beamaris
- Berwindi
- Blackmans Flat Roman Catholic Cemetery
- Braemai
- Church of St John the Evangelist
- Cottage
- Cottage and Stone Barn
- Cullen Bullen School
- Farmhouse
- House Opposite Lidsdale House (x2)
- Lidsdale House and Gardens
- Maddox Lane Group (x6)
- Meadowside
- Miners Cottage (x4)
- Old Wallerawang School (former National School)
- Square and Compass Inn (former)
- The Cottage
- The Meadows
- Uniting Church
- Windmill Lad Stud
- Wolgan Homestead (Wolgan Valley Station)
- Woodlands

While not listed on local, state or national heritage resisters, it is noted by local community members that sections of the track exhibit brickwork used in the formation of the original Donkey Steps Track, dating back to the early 1800s. Further, local landowners note the original house and storefront which serviced the now historic shale mines (remnants of which still stand today) is located nearby on private property.

During the November site visit, no historic stonework was observed, and it is possible the road diverges from the Donkey Steps Track at these points. However, vegetation cover, which is dense regrowth for much of the alignment may have inhibited visibility of the historic stonework. As such, it is recommended GPS coordinates of the known stonework be obtained, and impacts avoided. No further items of potential historical heritage significance were observed or are recorded within the study area.

4.5.2. Potential Non-Aboriginal Heritage – Construction

Due to the prior disturbance to the proposed diversion alignment, including the Donkey Steps track and historic clearing either side of the track for laying the telecommunications cable and more recent

clearing for fire access, it is highly unlikely that any items of non-Aboriginal Heritage will be discovered during clearing and preparation for the track upgrade.

No impacts to known surrounding heritage sites are anticipated, provided the safeguards identified in Section 4.5.4 are strictly adhered to. There is however, always potential for the works to uncover unanticipated finds. The environmental safeguards outlined in Section 4.5.4 will 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 the upgraded Donkey Steps track.

Table 14 Non-Aboriginal Heritage impacts summary table

Description	Y	N	Comments
Are there any items of non-Aboriginal heritage located within the vicinity (1 km) of the proposed works?		X	No; however, there are items further afield
If yes, list the item(s) and their heritage significance (i.e. s170 register, Council Register, State Heritage Register, National Heritage Register).	23 items occur within 10 km of the works; none of these will be impacted by the Proposal		

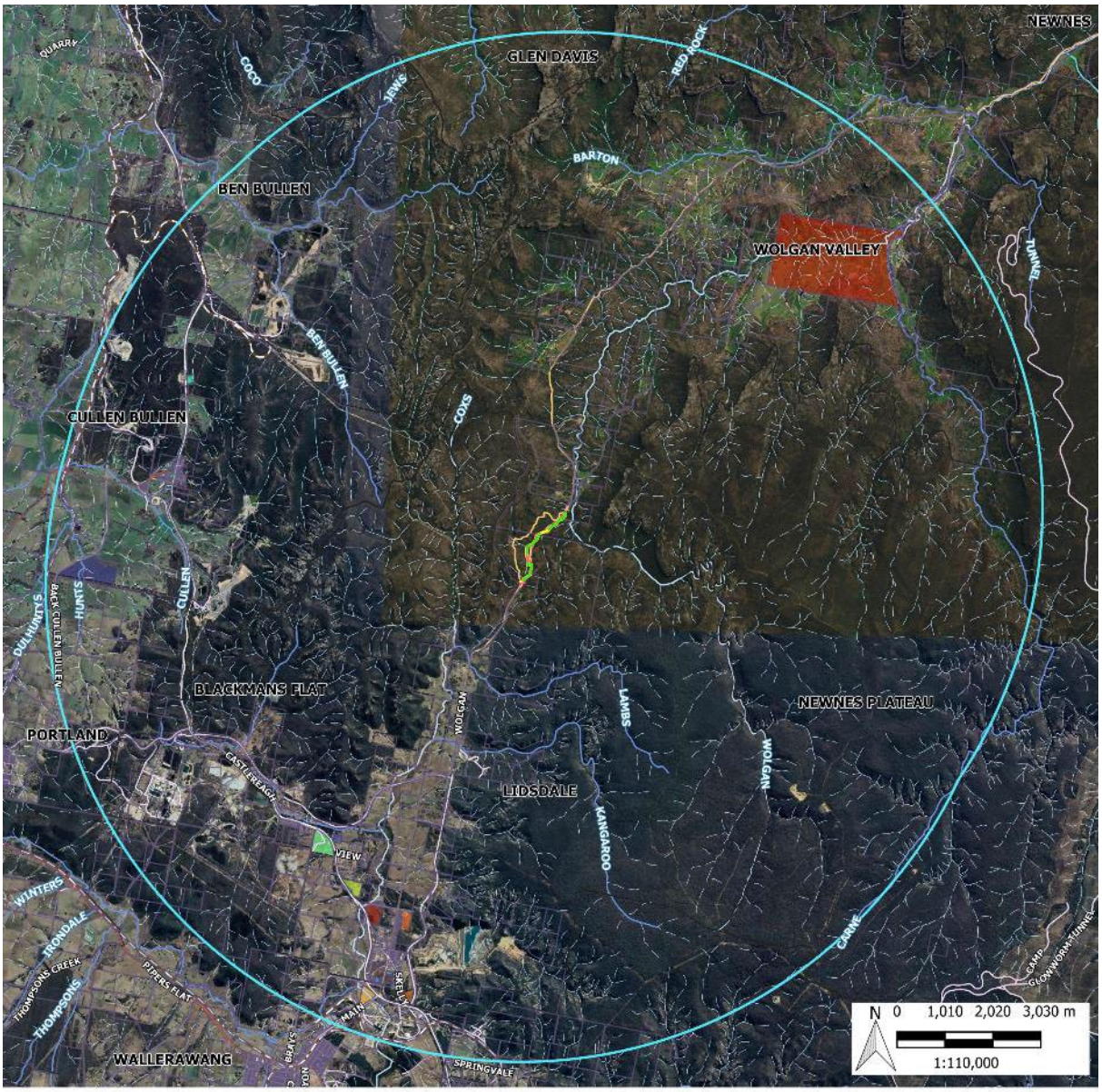
4.5.4. Environmental Safeguards – Non-Aboriginal Heritage

The Environmental Safeguards for Non-Aboriginal Heritage are considered part of the Wolgan Road Emergency Bypass Project and must be implemented.

Safeguards to be implemented and maintained for Non-Aboriginal Heritage include:

- The proposed works must be contained to the area assessed during the construction. If the proposed location is amended, further archaeological assessment may be necessary to determine if the proposed works will impact any items of historical significance.
- 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. Including historical stonework on the Donkey Steps Track not identified on the heritage register.
- Any newly discovered 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.



Wolgan Road Emergency Bypass -Non Aboriginal Listings within a 10km Radius of the Proposal Location

Legend

- Study Area
- Subject Site
- Proposed Diversion Alignment
- Optic Fibre Alignment
- Existing Road Corridor
- Suburb
- Lot Boundary

Roads

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

Waterway

- Creek
- River
- Gully
- 1st and 2nd order unnamed waterways

Heritage Listings

- Back Cullen Cemetery
- Beaumaris
- Berwindi
- Blackmans Flat Roman Catholic Cemetery
- Braemai
- Church of St John the Evangelist
- Cottage
- Cottage and Stone Barn
- Cullen Bullen General Cemetery
- Cullen Bullen School
- Farmhouse
- Former Wallerawang Public School and Residence
- House opposite Lidsdale House
- Lidsdale House and Gardens
- Maddox Lane Group
- Meadowside
- Old Wallerawang School (forner National School)
- Square and Compass Inn (former)
- The Cottage
- The Meadows
- Uniting Church
- Windmill Lad Stud
- Wolgan Homestead (Wolgan Valley Station)
- Woodlands

Figure 9 Items of non-Aboriginal heritage in proximity to the Proposal

4.6. Aboriginal Heritage

4.6.1. Existing environment

The name Wolgan Valley is derived from the Aboriginal word 'wolga' which describes the plant commonly known as 'Old Man's Beard' (*Clematis aristata*). It is possible that Aboriginal people relied on the Wolgan River as a water source and utilised it for fishing and surrounding areas as camp sites historically. Aboriginal artefacts may therefore remain throughout the locality, especially adjacent the river.

Maiyingu Marragu (Blackfellows Hands) is a collection of Aboriginal hand stencils located in a cave off Wolgan Road to Newnes, approximately 600 m southeast of the study area on the plateau. Several Aboriginal burial sites also are reported to be here.

Mingaan Wiradjuri Aboriginal Corporation conducted a site visit on 28 November 2022. Prior to the site visit a search of the Aboriginal Heritage Information Management System ('AHIMS') within a 1 km radius of the study area was conducted (Appendix C).

Following this site visit, it was agreed that an Aboriginal Due Diligence (ADD) assessment report would be produced in accordance with the DECCW 2010 Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (the Due Diligence Code of Practice) prior to any construction works commencing for the Proposal.

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.

Historic disturbance and factors contributing to the existing environment (such as location, raw materials, soils, geology and vegetation), make the presence of unknown PADs unlikely. However, completion of an Aboriginal archaeological assessment in the form of an ADD is required prior to the commencement of upgrade works as described in this report.

4.6.3. Potential Aboriginal Heritage Impacts – Operation

No impacts to places, artefacts or Aboriginal Heritage sites are expected during use/operation of the Wolgan Road diversion. This will be determined through the completion of the ADD process, and through avoidance of artefacts if any items are identified on site.

Table 15 Aboriginal Heritage impacts summary table

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 – there are records in proximity to the Proposal, however no records occur within the study area.

Description	Y	N	Comments
Are there any known items of Aboriginal Heritage near the works area (< 1km)?	X		A number of Aboriginal Sites are recorded within 1km of the proposal, including Maiyingu Marragu (Blackfellows Hands) within 500m of the Proposal
Is consultation with stakeholders required? E.g. the Local Aboriginal Land Council	X		Yes; this has been undertaken with the Mingaan Wiradjuri Aboriginal Corporation
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	Not currently required; this might need to be amended pending completion of the Aboriginal Due Diligence assessment

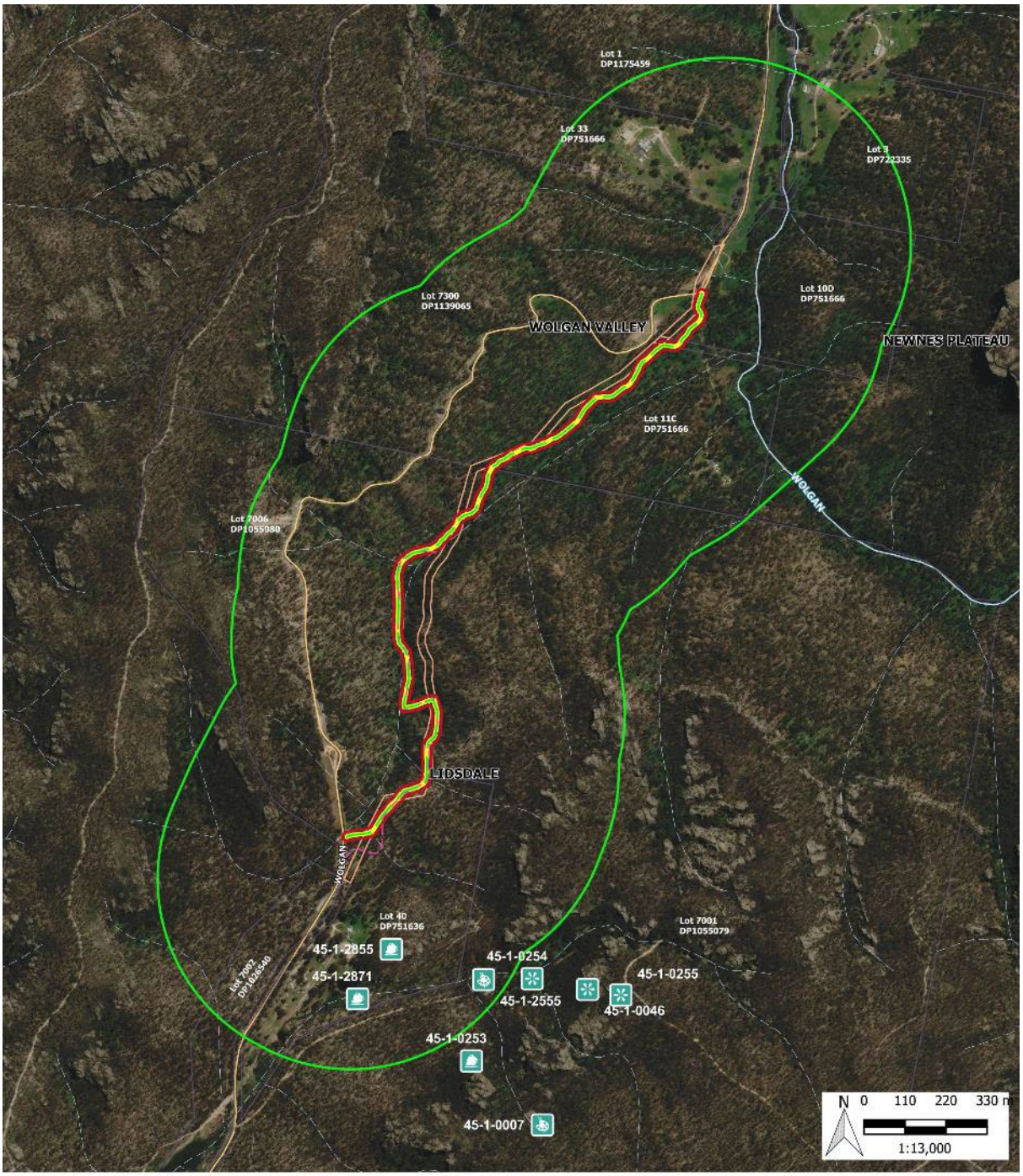
4.6.4. Environmental Safeguards – Aboriginal Heritage

The Environmental Safeguards for Aboriginal Heritage are considered part of the Wolgan Road Emergency Bypass Project and must be implemented. Safeguards to be implemented and maintained for Aboriginal Heritage include:

Safeguards to be implemented for Aboriginal Heritage are:

- All staff and visitors should be inducted to site to ensure they are aware of the possible presence of sensitive Aboriginal heritage items located within the vicinity of the work site, and the protective measures that should remain in place throughout the works.
- An Aboriginal Due Diligence Assessment (ADD) must be completed by appropriately skilled and experienced archaeologists or equivalent prior to any ground disturbing works commencing on the site.
- The due diligence assessment must be kept by Lithgow City Council so that it can be presented, if needed, as a defence from prosecution under Section 86(2) of the National Parks and Wildlife Act 1974
- Should unanticipated archaeological material be encountered during site works, all work must cease and an archaeologist contacted to make an assessment of the find. Further archaeological assessment and Aboriginal community consultation may be required prior to the recommencement of works. Any objects confirmed to be Aboriginal in origin must be reported to Heritage NSW.
- The proposed works must be contained to the area assessed during this archaeological assessment, as shown on Figure 1. If the proposed location is amended, further archaeological assessment may be necessary to determine if the proposed works will impact any Aboriginal objects or archaeological deposits.
- If sub-surface Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Council's Manager Strategic Planning and Manager Environment or an archaeologist are to be contacted immediately. Works in the vicinity of the find must not re-commence until clearance has been received from those Council officers and the NSW Office of Environment & Heritage. Further archaeological assessment and Aboriginal community consultation may be required prior to the recommencement of works.

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



Wolgan Road Emergency Bypass -Aboriginal Listings within a 500m Radius of the Proposal Location

Legend

- 500m Radius
- Study Area
- Subject Site
- Proposed Diversion Alignment
- Optic Fibre Alignment
- Existing Road Corridor
- Suburb
- Lot Boundary

Roads

- Sub Arterial Road

Waterway

- River
- 1st and 2nd order unnamed waterways

AHIMS Sightings

- Art (Pigment or Engraved)
- Art (Pigment or Engraved), Artefact
- Artefact

Figure 10 Aboriginal heritage items in proximity to the Proposal

4.7. Biodiversity

A comprehensive Flora and Fauna Assessment (FFA) was undertaken for the proposal, with detailed ecological investigation and reporting undertaken. The below provides a summary of this work, with the project FFA included as Appendix B.

4.7.1. Existing Environment

The subject site occurs along a 2.13 km section of an existing, roughly formed access track which was re-established during the catastrophic 2019 / 2020 bushfire events. The track can be described as steep and precarious, with access limited to 4WD vehicles.

The alignment generally follows an existing track which is predominantly cleared of large trees, and generally dominated by regrowth native vegetation. Some larger remnant trees, including fire effected trees, stags and hollow-bearing trees along the edges of the existing track will require removal to construct the roadway to the required width.

The northern portion of the subject site runs through a valley, and the remnant woodland vegetation in this area is heavily fire effected and dominated by dense regeneration as a result of the recent bushfires. In fire effected areas, many annual weedy species are present within the understory. As the subject site progresses uphill to the south, the fire damage (and subsequent regeneration) lessens. The southern section of the site occurs along steeper slopes and fire damage is minimal in this area.

Five (5) unnamed waterways pass through the subject site/study area (Figure 2), including one 3rd order stream mapped as containing KFH.

The site is connected to large tracts of native vegetation within the Blue Mountains. The Newnes State Forest occurs to the east and south of the subject site, and Ben Bullen and Wolgan State forest occur to the north and the west.

The majority of the study area is located on unmapped land and Category 2 – Vulnerable Regulated Land on the Native Vegetation Regulatory Mapping (DPIE 2022). The Category 2 – Vulnerable Regulated Land will be directly impacted as a result of the proposal.

An area mapped as containing biodiversity values on the Biodiversity Values Map occurs to the north of the subject site along Wolgan River. This area is located within a 500 m radius of the subject site, however falls outside of the study area and would not be impacted by the proposal

PCTs were difficult to accurately determine during the site surveys due to both the modification of the communities present (high density of regenerating native eucalypts containing only juvenile foliage due to fire) and a lack of reproductive material on mature eucalypt species present at the time of the site assessment. Subsequently, PCTs were assigned based on best fit using landscape position and species composition derived from the small amount of floristic identifying material available.

Ground-truthed vegetation revealed discrepancies with mapped vegetation communities, with only one (1) PCT (plus non-native vegetation) confirmed as present within the study area and subject site during surveys (Refer FFA – Appendix B for further details) as follows:

- PCTID: 0 - Not Native
- PCTID: 3227 - Western Blue Mountains Sheltered Shale Forest
- PCTID: 3369 - Central Tableland Ranges Peppermint-Gum Grassy Forest
- PCTID: 3735 - Central Tableland Peppermint Shrub-Grass Forest
- PCTID: 3749 - Western Blue Mountains Scribbly Gum Forest

The subject site occurs within remnant forest in the Blue Mountains nearby and roughly parallel to the Wolgan Road. The northern portion of the subject site runs through a valley, with the remnant woodland vegetation in this area having been heavily fire effected in the 2019/2020 fires and dominated by dense native regeneration with exotic weed species present along disturbed track areas. As the subject site progresses uphill to the south, the fire damage (and subsequent regeneration) lessens. The southern section of the site occurs along steeper slopes with fire damage minimal in these areas. The alignment generally follows an existing cleared track which is predominantly cleared of large trees, and generally dominated by regrowth native vegetation that has been partially degraded by past construction activities, including the introduction and spread of exotic weeds. Some larger remnant trees, including fire effected trees, stags and hollow-bearing trees along the edges of the existing track, will require removal to construct the roadway at the required width.

The site is connected to large tracts of native vegetation within the Blue Mountains. The Newnes State Forest occurs to the east and south of the subject site, and Ben Bullen and Wolgan State Forests occur to the north and the west of the site. In addition, The Blue Mountains National Park, Wollemi National Park and Gardens of Stone National Park are all connected to the subject site in the wider locality.

The following threatened species and/or ecological communities were recorded within the study are during surveys:

- Flame Robin, *Petroica phoenicea* Vulnerable under the BC Act

Based on the desktop assessment, site visit and habitat assessments undertaken, a total of **thirty-two (32)** threatened fauna species and **three (3)** threatened flora species were considered as having the potential to be impacted as a result of the Proposal.

Plate 4 Existing clearance along northern section of study area showing regrowth due to previous clearing and recent fire

Plate 5 Existing cleared track and PCT 3735 on track edges, southern end of study area

Plate 6 High-quality waterway bisecting the subject site

Plate 7 Existing track containing dense regrowth with PCT 3369 on track edges

Plate 8 Hollow bearing tree within study area, marked for retention

Plate 16 High quality remnant vegetation and rocky escarpments adjacent the study area

4.7.2. Potential Biodiversity Impacts – Construction

In total, 4.91 ha of native vegetation occurs within the study area. Of this, 1.11 ha of native vegetation will be directly impacted, including some mature trees, hollow-bearing trees and stags, and predominantly regrowth and juvenile species which have regrown on the existing track. This

represents 32% of the overall native vegetation present within the immediate study area. The site is connected to extensive tracts of high-quality forested habitat surrounding the study area including the Blue Mountains National Park, Wollemi National Park and Gardens of Stone National Park.

Thirteen (13) hollow-bearing trees, nest trees and stags (habitat trees) and twenty-five (25) mature eucalypts were recorded within or immediately adjacent the subject site with direct impacts to all of them likely. In total, **nine (9) hollow-bearing trees**, **three (3) stags** and **one (1) nest tree** require removal. A further **twenty-five (25) mature eucalypts** that do not contain known habitat but provide habitat value to fauna will also require removal along and adjacent to the proposed track. One hollow-bearing tree was recorded as containing nestling Kookaburra at the time of the surveys, and given the reduction in available hollow-bearing habitat in the surrounding landscape due to the 2019/22 bushfires, it is likely that most hollow-bearing trees support fauna within the study area.

Long-term negative effects to fauna as a result of the proposal are considered to be minimal given the limited direct impacts of the proposal, and the extensive areas of high quality habitat present within the study area and locality.

Impacts are restricted to the clearing of predominantly juvenile vegetation along an existing track, and subsequently would not create any significant additional fragmentation of habitat beyond what already occurs throughout the locality. Additionally, there are large areas of preferred habitat connected to the subject site in all directions of the study area, which contain high quality native woodland and forest vegetation suitable to suitable to support these species. Appropriate mitigation measures (preclearance checking for animals present and adherence to clearing limits) will also reduce any potential impacts to individual fauna that may be present during construction works.

Impacts to waterways will occur as a result of the proposal as follows:

- Two (2) 1st order waterways
- Two (2) 2nd order waterways
- One (1) 3rd order waterway also mapped as Key Fish Habitat

Impacts to the above waterways include the laying of culverts within stream beds, earth works along and within the riparian edge, and sedimentation during construction which may impact on aquatic fauna present within the streams. As the Proposal will require construction works within areas of KFH and 3rd order waterways, a Part 7 permit under the FM Act is required. This is discussed further in Section 1.3

Indirect impacts as a result of the proposal include increased noise and dust levels, potential erosion and runoff, and the introduction of weeds and other pathogens. Noise, dust and runoff have the potential to travel long distances and disrupt wildlife outside of the study area. Presence of vehicles, machinery and staff within and surrounding the study area may also increase localised disturbance to terrestrial species that feed or breed in the area. Sedimentation during clearing and road construction works may migrate downhill into drainage lines. Indirect impacts to vegetation communities within the Study area may also occur through increased activity causing erosion, dust settling on foliage and potential for the introduction of weeds or other pathogens.

Construction safeguard and mitigation measures outlined in Section 6, Appendix B of the FFA are provided to reduce the severity and likelihood of potential direct and indirect impacts on flora and fauna, and given that they are adhered to, the proposal is unlikely to significantly impact on biodiversity values present at the site.

Based on the desktop assessment, site visit and habitat assessments undertaken**, thirty (32) threatened fauna** species and **three (3) threatened flora** species were considered as having the potential to be impacted as a result of the proposal (see **Error! Reference source not found.** of Appendix B). Of these, only the Flame Robin was recorded within the study area during site surveys. Assessments of Significance for threatened species likely to be impacted by the Proposal were prepared in accordance with Section 1.7 of the EP&A Act and the EPBC Act *Matters of National Environmental Significance – Significant Impact Criteria guidelines* (DEWHA 2009). These assessments concluded that a significant impact to these species and community is **unlikely**. Consequently, neither participation in the Biodiversity Offset Scheme/preparation of a Species Impact Statement nor Referrals to the Minister are warranted.

It is recommended that clearing of native vegetation, in particular removal of large habitat trees and trees containing hollows (trees marked as Recommended for Retention – RR), is avoided or minimised where possible throughout the subject site. Additionally, it is required that an ecologist is present to conduct pre-clearing surveys and the two-stage clearing procedure (see Section 6) immediately prior to and for the full duration of the removal of vegetation to assess for any potential fauna present (threatened or otherwise), and an ecologist must be present at the time of habitat removal (i.e. nests and hollow-bearing trees) to supervise clearing and rescue any potentially occurring fauna.

Further mitigation measures proposed for these works include timing of clearing to occur outside of key breeding times (Spring) where practicable, erection of nest boxes to offset lost habitat resources, sediment and erosion control, stockpiling and earthworks in line with Bluebook requirements, and adherence to strict hygiene procedures.

Table 16 Key Threatening processes related to the Proposal

KTP	Status	Comment
Clearing of native vegetation	BC Act; EPBC Act	The Proposal would result in the clearing of potentially 1.11 ha of native midstory and understory vegetation and likely include some mature trees. The vegetation is in moderate to good condition. The clearing of this vegetation would comprise an increase in the operation of this KTP. The CEMP would include measures to minimise impacts on native vegetation and potentially threatened flora and fauna.
Clearing of hollow-bearing trees	BC Act	Up to twelve (12) hollow bearing trees / stags may be directly impacted by the current Proposal. The Proposal would increase the operation of this KTP through the removal of these limited habitat resources, however, wherever possible, hollow-bearing trees will be retained.
Removal of dead wood and dead trees	BC Act	There are low to moderate quantities of dead wood and dead trees scattered throughout the study area that would provide habitat resources for native fauna, including threatened species. The subject site also contains woody debris which would be removed as a result of the Proposal. The Proposal may increase the operation of this KTP.
Invasion of plant communities by perennial exotic grasses	BC Act	There is the potential for perennial exotic grasses to further invade native vegetation through disturbance during construction of the Proposal. Mitigation measures outlined in Section 6 are likely to effectively limit the operation of this KTP.

KTP	Status	Comment
Infection of native plants by *Phytophthora cinnamomi*	BC Act; EPBC Act	Construction activities have the potential to introduce the root-rot fungus *Phytophthora cinnamomi* into the broader study area, which could lead to dieback of vegetation. Mitigation measures are likely to effectively limit the operation of this KTP.
Introduction and establishment of Exotic Rust Fungi of the order *Pucciniales* pathogenic on plants of the family Myrtaceae	BC Act	Construction activities have the potential to introduce Myrtle Rust to the study area. Mitigation measures are likely to effectively limit the operation of this KTP.

4.7.3. Potential Biodiversity Impacts – Operation

Improved accessibility along the proposed access track may result in increased use by general traffic which likely avoid the road at present. This has the potential to negatively impact fauna and flora species along this stretch of road. Increased visitation to the area may see a minor increase in pollution (air and waste), introduction of weeds and fungus, and direct disturbance to wildlife. In order to avoid non-residential use of the roadway, it is intended to be locked to prevent the general public.

Through the Assessments of Significance, review of KTP's and field surveys and analyses, it was concluded that the proposal is not likely to have a significant impact on any of the listed threatened biota likely to occur in the locality and at risk of being impacted by the Proposal.

Table 17 Biodiversity impacts summary table

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		Total impact area (subject site) of approximately 1.30 ha of vegetation (comprised of 1.11 ha native vegetation, and 0.19 ha of existing disturbed track), including mature trees. This vegetation occurs within and adjacent to the subject site. ToS have been prepared for thirty-two (32) threatened fauna species and three (3) threatened flora with the potential to be impacted as a result of the Proposal
Please list the number of trees and/or hollows to be removed as part of the proposed works.	X		Thirteen (13) hollow-bearing trees, nest trees and stags (habitat trees) and twenty-five (25) mature eucalypts were recorded within or immediately adjacent to the subject site with direct impacts to all of them likely. These were found to contain multiple hollows providing potential habitat for hollow dependent fauna including microbats, woodland birds and arboreal fauna.
Are the works taking place in a roadside area designated as high or medium conservation value vegetation?		X	Vegetation within the subject land does not occur in a roadside area.

Description	Y	N	Comments
Are there any threatened, endangered, or native flora and/or fauna located within the vicinity of the proposed works?	X		thirty (32) threatened fauna species and three (3) threatened flora were considered as having the potential to be impacted as a result of the proposal (refer Appendix B). One (1) threatened bird species (Flame Robin) were recorded within the Study area during surveys.

4.7.4. Environmental Safeguards – Biodiversity

The Environmental Safeguards for Biodiversity are considered part of the Wolgan Road Emergency Bypass Project and must be implemented.

Safeguards to be implemented and maintained for Biodiversity include:

Timing of Vegetation Clearing

- Where practicable, it is recommended to time the works outside of key breeding season (Spring) for the majority of native species likely to utilise the site for breeding to avoid nest abandonment, injury or death to native fauna.
- Preclearing surveys should be completed immediately prior to vegetation clearing commencing to determine which species are utilising the site at the time of works.

Tree Removal

- Preclearing surveys must be undertaken prior to the commencement of any clearing works.
- Clearly delineate vegetation to be removed/retained by a qualified arborist with the assistance of an ecologist, or similarly qualified professional, and induct all site personnel as to the approved extent of clearing. Ensure that no clearing of vegetation occurs outside of the marked boundary and retain mature trees and overhanging limbs wherever possible.
- Where any trees requiring removal contain hollows, nests or other signs of occupation, a two-staged clearing approach must be undertaken (see below)
- Ensure the presence or availability of an ecologist or fauna spotter catcher at all times during pre-clearing and clearing activities to remove and relocate wildlife as necessary, and to immediately attend to any wildlife that are injured as a result of works.
- Where possible felled trees and removed logs should be placed strategically and in proximity to the work site to provide refuge and potential habitat in the understorey whilst ensuring no further damage to surrounding vegetation. Placement of logs and felled trees will also aid in the regeneration of the area.
- Where additional vegetation removal is proposed this must first be assessed to consider the cumulative impacts against the approved clearance footprint, and if appropriate supervised by a qualified ecologist.

Two-stage clearing process

Vegetation clearing should be staged, commencing with the most disturbed vegetation in the north of the site and progressing south to increase the opportunity for fauna to vacate the site and disperse into areas of adjoining habitat to evade injury.

- Pre-clearing surveys process are to be undertaken immediately prior (within 24 hours) of vegetation clearing by a suitably qualified and appropriately licenced ecologist to identify any habitat present

- If animals or animal habitat are found, or suspected to be present, procedures outlined in the protocol for capture and relocation (below) will be followed.
- After all habitat vegetation is identified and appropriately marked (i.e with an 'X' or with flagging tape), surrounding non-habitat vegetation can then be cleared.
- If no fauna are found, then surrounding non-habitat vegetation can be cleared. This process will be monitored by the ecologist in case fauna are found to be at risk.
- The ecologist will document the outcomes of this process (e.g. number and species encountered/rescued).
- A wildlife rescue organisation (e.g. WIRES) should be made aware of operations in case any injured fauna are found. All animals encountered will be treated humanely, ethically, and in accordance with relevant codes under the NSW Prevention of Cruelty to Animals Act 1979
- At the completion of non-habitat vegetation clearing, the site will be left overnight (at least 12 hours) to allow for any nocturnal resident fauna to escape overnight.

Capture and relocation process

One day after the clearing of non-habitat vegetation (as per above), the site can be cleared of habitat vegetation.

For habitat and hollow-bearing trees expected or known to contain fauna (all trees marked with an "X") are to be felled in accordance with the procedure detailed below:

- A suitably qualified and experienced ecologist will be present, with appropriate animal-handling equipment and holding containers.
- Prior to felling or removal, clearing machinery will be used to gently shake or 'bang' the habitat tree for a period of 2-3 minutes (dependant on tree health and structural integrity) to encourage any resident fauna to vacate hollows. Sticks, poles or other similar hand-held objects will also be used to hit the trunk of the tree or log at various points, to encourage animals to vacate the tree. The tree will be observed for at least 5 minutes prior to completing this action.
- After the observation period, trees will be gently lowered/felled using an excavator bucket or dozer blade for support if possible. The ecologist will observe the tree felling and ensure that any hollows are not blocked by being placed against the ground.
- Once deemed safe by the plant operator, the ecologist will inspect each tree and hollows for fauna that may be present (uninjured, injured or deceased). Use of fibre-optic cameras to assist this process is recommended. The ecologist will document this process using the tree hollow inspection register.

Rehabilitation

- All tree hollows removed are to be replaced with artificial hollows (nest boxes or augmented hollows) at a rate of 2:1. The size of nest box entrances is to be suited to the requirements of the threatened species that occupy the area/matched to those that have been removed. Nest boxes should be erected near the habitat to be removed in a suitable position prior to the commencement of vegetation clearing works. The project ecologist should be consulted to determine appropriate type, size and number to be erected.
- Any required revegetation activities will be undertaken using native species sourced from local seed wherever possible. 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 clearing to reduce soil exposure and loss.

General

- Vehicles and machinery to work from the sealed road and are not to extend beyond the direct impact footprint.
- All soils to be stockpiled at designated stockpile locations 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.
- Where possible, 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. Existing verges and cleared areas are to be used for parking as a first priority.
- 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.
- Strict hygiene protocols, including vehicle inspections, washdown and toolbox talks addressing weed management, must be followed to ensure that no environmental weeds 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.
- Declared weeds must be managed according to requirements under the Biosecurity Act 2015. It is recommended that 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.

4.8. Traffic and Transport

4.8.1. Existing environment

Wolgan Road (which forms part of the Wolgan Valley Discovery Trail) is a sub-arterial rural road accessible from the Castlereagh Highway in Lidsdale. The road is used primarily by local residents and tourists to access the Wolgan Valley and the historical village of Newnes at the termination of the road.

Access along the road has been disrupted on several occasions in recent years. The sheer cliffs on either side make the road vulnerable to land slips and blockage from fallen debris. This occurred following the 2019 / 2020 bushfires where the road was impassable for a period of time due to the risk of landslip following a serious bushfire in the area.

The main Wolgan Road is currently closed, due to a major landslip on the steeply descending portion of road leading down into the Wolgan Valley. Consequently, access to the area is currently limited to 4WD access via the Old Coach Road which traverses the NPWS estate, and takes approximately 1 hour to traverse. The Old Coach Road is a single lane route for much of the alignment on the steep descent into the Wolgan Valley, and which also crosses the Wolgan River which is subject to flooding in this location, rendering this access pathway a risk for commuters and residents if heavy rains continue and the roadway becomes impassable.

The Donkey Steps trail is currently passable by foot only; the southern entrance to the road is blocked by strategically placed fallen timber, and the middle and northern portions of the road are heavily vegetated with dense regrowth post the 2019 / 2020 fires.

4.8.2. Potential Traffic and Transport Impacts – Construction

As the existing Wolgan Road is currently blocked and the diversion route is a new road route that is currently accessible by foot traffic only, traffic control and the closing of traffic lanes won't be required during construction works.

Delays to current road users moving through the Valley are not anticipated during the construction phase; commuters are already delayed in accessing the area via the Old Coach Road route.

There is the potential for disruption to local traffic from the movement of plant and construction vehicles using the open section of the Wolgan Road to access the works site.

4.8.3. Potential Traffic and Transport Impacts – Operation

After the emergency road safety upgrades are completed, the impact on the road for traffic and transport is anticipated to be positive with residents now able to access their properties while the main route is repaired. The upgraded Donkey Steps emergency bypass trail is anticipated to provide a permanent alternative access to the valley once fully operational.

The bypass road will only be accessible to local residents, emergency services and local businesses, and will have locked gates at either end to ensure access is safeguarded.

Table 18 Traffic and Transport impacts summary table

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	The Proposal's objective is to create a temporary diversion route while the main route is repaired. No detours or disruption to property access is anticipated.

Description	Y	N	Comments
Will there be any permanent major detours made as a consequence of the works?		X	No permanent major detours will occur as a result of the Proposal.

4.8.4. Environmental Safeguards – Traffic and Transport

The Environmental Safeguards for Traffic and Transport are considered part of the Wolgan Road Emergency Bypass Project and must be implemented.

Safeguards to be implemented and maintained for Traffic and Transport include:

Construction

- Prior notice shall be given to affected landowners along to notify residents of the works to be completed, their timing and duration as well as any closures due to construction, if required. Notification can be provided by various means including letterbox distribution, local paper and through the Council website. Given the works are to be implemented at short notice, door-knocking or contact by telephone may be feasible and can be preferable in this situation. All consultation and notification should occur with enough time before works to allow residents to make travel plans (1 – 2 weeks prior to commencement).
- Council's appointed contractor will consider the location of designated parking areas, stockpile locations, construction laydown sites, site offices, and access routes carefully with regard to creating inconveniences to residents, and to the other environmental constraints.
- A Traffic Control Plan (TCP) is to be developed in accordance with Australian Standards (AS 1742.3 – Traffic Control Devices for Works on Roads) and Roads and Maritime Traffic Control at Worksites manual to identify appropriate signage (and location) to advise motorist of upcoming changes in the road network (if applicable). Any variation to the layout of the TCP on site is to be recorded and certified by accredited TfNSW personnel.
- All road signs and marking will be in accordance with the TfNSW 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 existing environment consists of large rural properties with cattle and sheep farms, and vast tracts of native vegetation throughout the Wolgan Valley. The adjacent residences are sparsely distributed and are no longer intensively farmed. Locals enjoy a quiet lifestyle with the backdrop of the valley's escarpments making the relative isolation even more appealing. The valley is valued for its raw beauty and visitors come to experience the nature and wilderness in this landscape.

There are several accommodation options in the Wolgan Valley, including the Emirates *One&Only* resort; an ultra-luxury conservation-based resort on 7,000 acres approximately 8 km to the north east of the study area. For visitors that access the resort via vehicle, the drive into the resort along Wolgan Road is part of the wilderness experience. There is also a Cranbrook School rural campus located to the north west of the proposal location. At present the properties, businesses and school cannot be accessed by road in a two-wheel drive vehicle, as the only sealed road (Wolgan Road) is currently inaccessible.

Impacts to residents, businesses and other commuters is currently limited to once daily piloted traverses of the Old Coach Road; this is anticipated to be having a negative impact on the local community who cannot easily access shops, schools, places of work or medical services easily. NSW Western Area Health Services and Council's Community Resilience Officer have been working with the local community to manage the process and assist people where needed during this difficult time.

4.9.2. Potential Socio-economic Impacts – Construction

During construction there would be increased traffic on Wolgan Road between Lidsdale and the damaged section of Wolgan Road due to use by construction vehicles, machinery and personnel. Traffic flow along this section of road is anticipated to be very low given the impassable route through to the Wolgan Valley.

The construction period, though anticipated to be short-term (2 – 4 weeks) is likely to cause stress for locals; with limited access to shops, schools, workplaces and medical services via the Old Coach Road, and more rain predicted in the coming months, residents are likely to be eager for the works to be completed.

Bushwalkers and recreational 4WD vehicles would not be permitted to use the Donkey Steps track during construction or operation of the temporary diversion, potentially having temporary negative socio-economic impacts on recreational users of the area.

4.9.3. Potential Socio-economic Impacts – Operation

The current closure of Wolgan Road is having a profound detrimental impact on residences, businesses and visitors to the Wolgan Valley. Reinstating temporary access, and additional ingress / egress to the valley while Wolgan Road undergoes repairs will have long-term positive socio-economic impacts on the area.

Table 19 Socio-economic Considerations impacts summary table

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		Temporary disruption to local traffic and recreational bushwalkers.

4.9.4. Environmental Safeguards – Socio-economic Considerations

The Environmental Safeguards for Socio-economic Considerations are considered part of the Wolgan Road Emergency Bypass Project and must be implemented.

Safeguards to be implemented and maintained for Socio-economic Considerations include:

- 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 project 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 project, including design and construction to ensure best value for the local community.
- Disruption of traffic / private property access 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 Impacts associated with Socio-economic Considerations will not be significant if the above Safeguards are implemented and maintained.

4.10. Waste and Resource Use

4.10.1. Existing environment

The study area includes predominantly remnant native vegetation of variable quality and non-native vegetation within the Wolgan Rd road reserve, along the northernmost part of the Donkey Steps alignment, and within adjoining fenced mixed use agricultural paddocks. Excluding fencing, road construction and associated resource including signage, minimal anthropogenic disturbance or waste in the form of discarded waste was observed on site and the area was considered generally tidy.

4.10.2. Potential Waste and Resource Use Impacts – Construction

The Proposal is not anticipated to generate a significant amount of waste, with a net import of construction materials. The existing infrastructure would be used in the construction of the new road and, waste would be minimised by:

- Removed smaller vegetation (i.e. regrowth saplings, smaller branches) would be chipped and used onsite for ERSED control structures and site rehabilitation.
- Larger felled trees and logs would be placed within adjacent vegetation to be retained as habitat, or used as safety barriers or ERSED controls where appropriate.
- Topsoil would be windrowed and reused on batters.

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

- Soil and spoil and, excess civil construction materials
- Cleared vegetation
- Packaging
- Domestic and general waste, and
- Any excess road surface material such as gravel and sand.

During construction a small number of light vehicles and plant will be required to convey personnel to site and undertake the works (e.g. excavation, lifting/movement of equipment and materials). Where possible, local contractors will be engaged, and construction materials sourced from nearby fill and/or locally. Pollution and greenhouse gas (GHG) emissions from construction machinery/vehicles operating on site must also be reduced wherever possible to minimise cumulative impacts on climate and air quality.

Other than rock / fill materials and vegetative waste, the majority of the materials utilised in the works will be non-renewable, finite resources. Their use would diminish the availability of some resources for future use and contribute to pollution and greenhouse gas emissions through both direct use of fuels and the embodied energy used in their production, 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.

Construction works would require:

- Select fill and surface materials (where spoil is not suitable for reuse)
- Water (potable, raw and reclaimed effluent where appropriate/if available)

Any additional material that may be required would be sourced from legally operating commercial suppliers and manufacturers within the area. Where feasible, material with recycled content will be sourced.

Energy consumption associated with the proposed works would include electricity and fuel. Electricity would be required to power site compounds and/or portable traffic lights and would be supplied from a portable generator. Fuel would also be required to power construction plant and other vehicles.

Any construction wastes / contaminated materials will need to be handled carefully so as not to impact upon any sensitive environmental areas within the study area, to ensure Council undertakes its responsibilities as environmental custodians, and to care for the health and safety of their employees, contractors and constituents. All wastes will be managed in accordance with the POEO Act and in accordance with EPA and Council guidelines.

4.10.3. Potential Waste and Resource Use Impacts – Operation

No waste products will be generated as part of operation of the Wolgan Road emergency bypass, however there is a small risk of domestic litter from road users, and illegally dumped rubbish may continue to occur during the operation of the diversion route.

Table 20 Waste impacts summary table

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 for construction of the road, and/or remediation
Are the proposed works likely to require a Licence from NSW EPA for waste?		X	No; the works do not and will not require significant discharges of waste to the environment.
Will the ongoing operation of the site post completion of works generate significant amount of waste?		X	No additional ongoing waste is expected to be generated post construction

4.10.4. Environmental Safeguards – Waste and Resource Use

The Environmental Safeguards for Waste and Resource Use are considered part of the Wolgan Road Emergency Bypass Project and must be implemented.

Safeguards to be implemented and maintained for Waste and Resource Use include:

All wastes generated as part of this project 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/assessment may 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 DPE 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.

The Impacts associated with Waste and Resource Use will not be significant if the above Safeguards are implemented and maintained.

4.11. Visual Amenity

4.11.1. Existing environment

The study area is predominantly surrounded by native vegetation, rocky outcrops, bushfire affected native bushland and regrowth, and rocky escarpments. The combined natural and rural vistas of the locality contribute to its beauty and appeal. Dense weed

The general amenity along the proposed Wolgan Road emergency access road is pleasant with native vegetation, no visible litter or anthropogenic activity with the exception of the track itself.

Plate 9 Views of rocky escarpments from the subject site

Plate 10 Remnant and fire affected vegetation along the valley floor

Plate 11 Rocky outcrops along the Donkey Steps route

4.11.2. Potential Visual Amenity Impacts – Construction

The visual amenity of the study area will be temporarily affected as works are completed. Short-term impacts during construction will include earthworks and removal of vegetation as well as the presence of construction machinery and equipment and stockpile and compound sites.

Increased large vehicle traffic, and temporary infrastructure works will also detract from the existing visual environment. Due to the absence of dwellings and public access occurring within the vicinity of the works, visual amenity impacts during construction are considered to be low.

4.11.3. Potential Visual Amenity Impacts – Operation

Post construction, visual amenity will have long-term impacts, with the temporary diversion of Wolgan Road creating a visual effect on previously minimally disturbed bushland.

Table 21 Visual Amenity impacts summary table

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, and long-term alteration of visual aesthetics.

4.11.4. Environmental Safeguards – Visual Amenity

The Environmental Safeguards for Visual Amenity are considered part of the Wolgan Road Emergency Bypass Project and must be implemented.

Safeguards to be implemented and maintained for Visual Amenity include:

Construction

- Considerate construction practices are to be implemented at all times, to ensure the works areas are neat and visually not offensive, including to be kept free from rubbish, and stockpile sites actively managed.
- No additional, unauthorised clearing or destruction of vegetation is to occur.
- Vehicles are to be parked in designated areas only.
- 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.
- Appropriate consultation will continue to be undertaken to inform businesses and residents of planned works, timing, and potential visual impacts.
- Any complaints received regarding visual amenity at the site are to be dealt with and rectified as soon as possible.

Operation

- Cleared, bare patches 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.

- Any impacts to property entrances, driveways or fencing are to be rectified in collaboration with the landholder/s as soon as possible, post completion of works in the vicinity.

The Impacts associated with Visual Amenity will not be significant if the above safeguards are implemented and maintained.

4.12. Climate Change

4.12.1. Existing Environment

Limited meteorological data for the area is available from the now closed Bureau of Meteorology (BoM) Lithgow (Newnes Forest Centre) weather station. The weather station was located approximately 10 km northeast of the subject site and previously recorded observations of several meteorological data including temperature, humidity and rainfall, wind speed and wind direction. Temperature data collected from 1938 to 2002 indicates that January is the hottest month of the year in the area with a mean maximum temperature of 23.5 °C, and a mean minimum temperature of -1.1 °C in July, which is the coolest month of the year. Rainfall data reveals that the area receives on average 1091.9 mm of rain per year; although January - March receives the most rain, the area experiences a relatively even spread of rainfall throughout the year.

Table 22 Long term climate averages for Lithgow (Newnes Forest Centre)

Observation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Daily Minimum and Maximum Temperatures													
Minimum (°C)	9.9	10.5	9.0	5.5	2.3	0.3	-1.1	-0.1	1.4	4.9	6.9	9.2	4.9
Maximum (°C)	23.5	22.6	20.5	16.7	13.0	9.9	9.4	10.6	14.0	17.4	19.9	22.9	16.7
Rainfall													
Rainfall (mm)	121.0	114.1	102.9	79.9	81.3	83.0	68.3	83.5	67.9	91.5	89.0	90.4	1091.9
Rain days	10.6	10.8	10.2	7.5	8.3	8.4	8.0	9.0	8.0	9.0	9.0	8.7	107.5

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 Lithgow, 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 -23 % for rainfall (Climate Change in Australia, Analogues Explorer, 2021).

Lithgow is projected to experience an additional 5 to 10 hot days per year compared with the current average.

The Lithgow region is predicted to experience an increase in rainfall across Summer, Autumn and Spring, and a decrease in Winter; 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 sites occur within a designated bushfire prone area (NSW Rural Fire Service, 2021). In addition, a harsher fire-weather climate is predicted in the future (high confidence), improved and safer access 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 project 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

No impacts to climate change are expected during use/operation of the Wolgan Road emergency bypass.

4.12.4. Environmental Safeguards – Climate Change

The Environmental Safeguards for Climate Change are considered part of the Wolgan Road Emergency Bypass Project and must be implemented.

Safeguards to be implemented and maintained for Climate Change include:

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),
    - Disposal is undertaken as a last resort (in accordance with the *Waste Avoidance & Resource Recovery Act 2001*).
- Council may elect to make a contribution to green power to offset greenhouse gas emissions.
- 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

- Road and culvert upgrades to be monitored and maintained per Council's routine road management strategy, to ensure lifecycle of upgraded road features extended and to reduce wastage from neglect / inadequate maintenance.

The Impacts associated with Climate Change will not be significant if the above safeguards are implemented and maintained.

5. Consideration of State and Commonwealth environmental factors

This section considers the proposed development 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, Environment and Water (DCCEEW).

Table 23 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 listed threatened species or communities?	Yes, though this is not considered likely to be significant (refer Appendix B)
Any impacts on listed migratory species?	Yes, though this is not considered likely to be significant (refer Appendix B)
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 Clause 171 (2) of the *Environmental Planning and Assessment Regulation 2021.* 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 summarized in Table 24 below.

Table 24 Compliance with Clause 171 (2) of the EP&A Regulation 2021

Environmental Factor	Will there be an impact?	Comments
(a) Any environmental impact on a community?	Yes	Construction: Minor traffic delays for the community immediately north of Lidsdale are possible during construction. Operation: Positive outcomes for the community are anticipated, through reinstating road access to the Wolgan Valley
(b) Any transformation of a locality?	Minor	Construction: excavation and construction works are proposed along an alignment that has undergone prior clearing and disturbance. Operation: changes to the environment with the addition of a road previously not utilised for vehicles.
(c) Any environmental impact on the ecosystems of a locality?	Yes	Construction: Clearing of up to **1.1 ha** of native vegetation (Appendix B) – however this is not anticipated to be significant. Operation: no further operational impacts
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?	Minor	Construction: clearance of native vegetation and earthworks likely to reduce aesthetics of the site. Operation: after emergency bypass is completed, the aesthetic and recreational value of the locality will be reduced.
(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	No – ADD report confirmed that the study area has low potential for subsurface archaeological deposits and no archaeological material was identified within the study area.
(f) Any impact on habitat of any protected fauna (within the meaning of the National Parks and Wildlife Act 1974)?	Yes	Impacts to native species is expected (Refer Appendix B), however this is not anticipated to be significant provided the Environmental Safeguards are adhered to for both construction and operation.

Environmental Factor	Will there be an impact?	Comments
(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	Construction: Removal of potential habitat for threatened species is not likely to result in endangerment of these species, assuming all the Environmental Safeguards are adhered to. Operation: Continued use of the site as a roadway as an in frequent, alternative access route is not likely to result in further risk of endangering native species.
(h) Any long-term effects on the environment?	Yes	Native vegetation including habitat features will permanently be removed as part of the road temporary diversion works.
(i) Any degradation of the quality of the environment?	Minor	The construction of the emergency bypass will bisect native vegetation tracts, introduce noise and vibration to the area, impact waterways, and potentially increase erosion. However, the impact is not anticipated to be significant if all of the Environmental Safeguards are adhered to.
(j) Any risk to the safety of the environment?	No	The emergency bypass is not anticipated to increase risk to the safety of the environment.
(k) Any reduction in the range of beneficial uses of the environment?	Yes	Construction: impact to native bushland through removal of trees and groundcover vegetation. Operation: the use of the site is anticipated to have a beneficial impact on the use of the environment through reinstating access to the Wolgan Valley once operational.
(l) Any pollution of the environment?	No	Construction: potential for movement of sediment and other pollutants into waterways during construction works. Operation: potential for sediment to migrate into waterways due to removal of vegetation and loss of ground stability.

Environmental Factor	Will there be an impact?	Comments
(m) Any environmental problems associated with the disposal of waste?	No	Construction: not anticipated to generate large volumes of waste and so impact not deemed significant. Operation: not anticipated to generate large volumes of waste and so impact not deemed significant.
(n) Any increased demands on resources, natural or otherwise which are, or are likely to become, in short supply?	Yes, minor	Construction: not anticipated to consume large volumes of finite resources and so impact not deemed significant. Operation: not anticipated to consume large volumes of finite resources and so impact not deemed significant.
(o) Any cumulative environmental effect with other existing or likely future activities?	No	Potential for cumulative impacts with other major construction activities present in the area, including the repair of Wolgan Road.
(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	LCC Community Strategic Plan 2035. Lithgow's Strategic Plan and Asset Management Plan, also Council's Emergency Planning guidelines. Any goals for roads / access for community?
(r) Any other relevant environmental factors	No	Construction: other factors considered include community and stakeholder consultation and property matters. 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 subsection (2) clause 171 of the EP&A Regulation 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.

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 clause 170 of the EP&A Regulation, and the information it contains is neither false nor misleading.

Prepared by:	Reviewed and Endorsed for Certification by:
Name: Katte Farrell, Janet Sanderson and Graham Stirling	Name: Emily Cotterill
Title: GIS and Environmental Consultant, Data and GIS Coordinator, Environmental Projects Coordinator	Title: Director
Date: 29/11/2022	Date: 29/11/2022

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 Lithgow (Newnes Forest Centre) weather station

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

DCCEEW 2021 Species Profile and Threats Databases

DCCEEW 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, holds data from a number of custodians.

History and Heritage, https://www.grenfell.org.au/history-and-heritage

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 June 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 June 2021

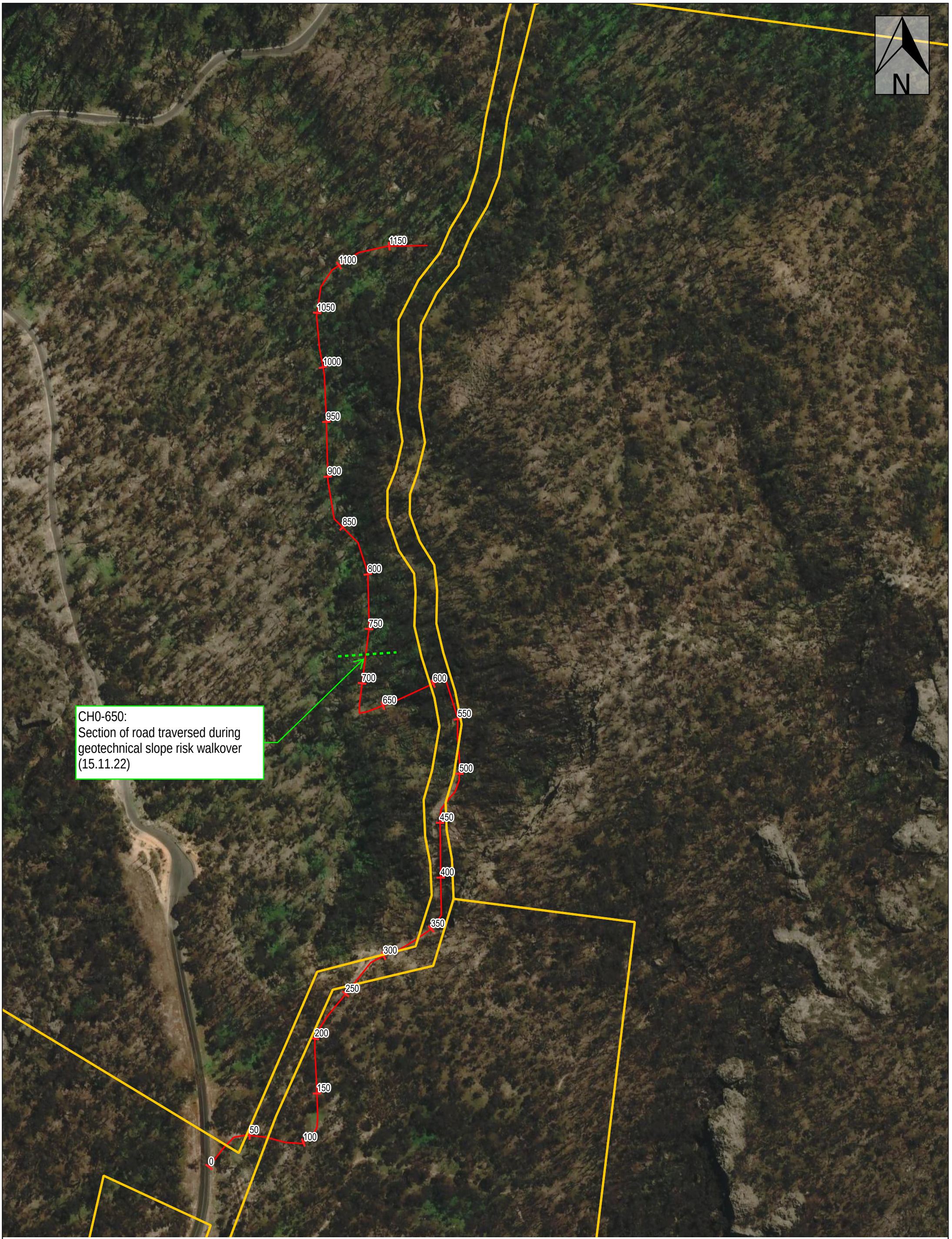
NSW Rural Fire Service (2021) www.rfs.nsw.gov.au

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

8. APPENDICES

Appendix	Item
Appendix A	Design Drawings
Appendix B	Flora and Fauna Assessment Report
Appendix C	Aboriginal Due Diligence Assessment Report
Appendix D	Summary of Environmental Safeguards

Appendix A – Design Drawings



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20 0 20 40 60 80 m

CLIENT
Lithgow City Council

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-11-16
DESIGNED	GW
PREPARED	GW
REVIEWED	NS
APPROVED	NS

PROJECT
Wolgan Gap

TITLE
Donkey Steps Alignment
Site overview

PROJECT NO	DOC	REV.	FIGURE
	101	**A2**	**1**

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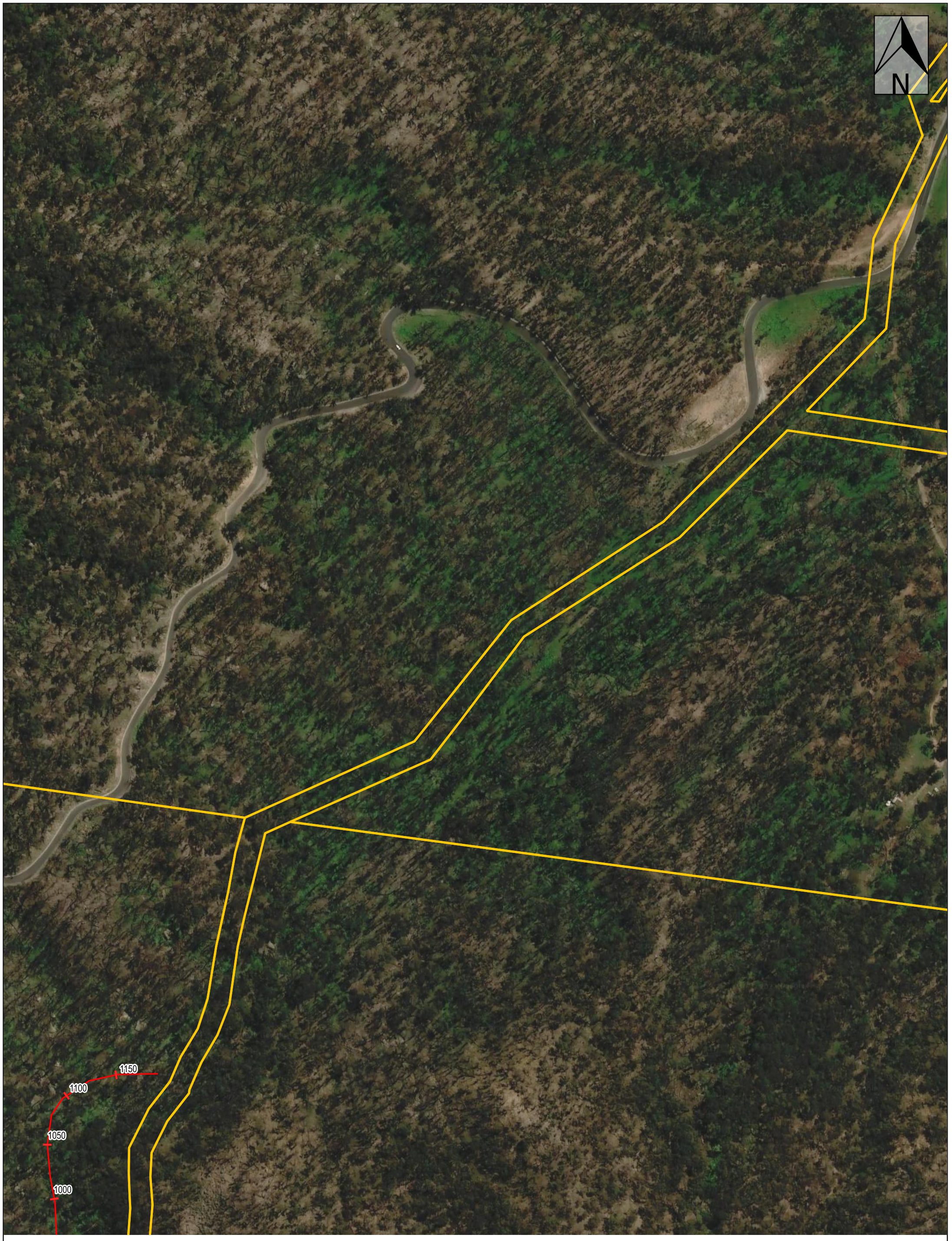


DRAFT

1:3,000

20 0 20 40 60 80 m

CLIENT
Lithgow City Council

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-11-16
DESIGNED	GW
PREPARED	GW
REVIEWED	NS
APPROVED	NS

PROJECT
Wolgan Gap

TITLE
Donkey Steps Alignment
Site overview

PROJECT NO	DOC	REV.	FIGURE
	101	**A2**	**2**

QGIS v.3.16.9-Hannover - printed by: Wetherell, Genni - path: \\corp.pbwan.net\ANZ\Projects\AU\PS133xx\PS133509_LCC_SRA_Call_Outs\4_WIP\Docs\QGIS\WORKINGIPS133509 - LCC SRA.qgz

CRS:EPSG:7856 - +proj=utm +zone=56 +south +ellps=GRS80 +units=m +no_defs

Appendix B – Flora and Fauna Assessment Report

Appendix C – AHIMS Search Result

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Donkey Steps

Client Service ID : 735362

The Environmental Factor

P.O Box 268

Bathurst New South Wales 2795

Attention: Janet Sanderson

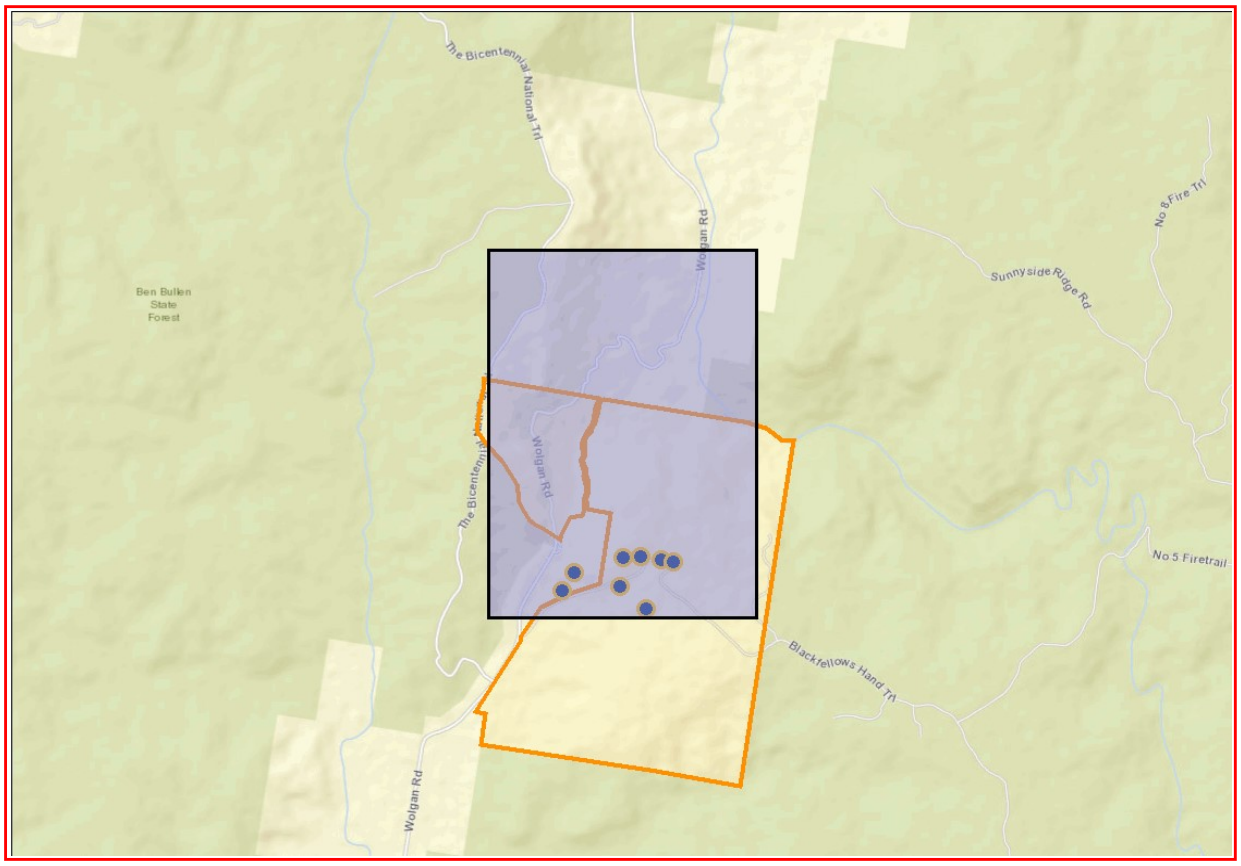
Email: jan@envirofact.com.au

Date: 24 November 2022

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -33.3237, 150.1065 - Lat, Long To : -33.299, 150.1276, conducted by Janet Sanderson on 24 November 2022.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

8	**Aboriginal sites are recorded in or near the above location.**
1	**Aboriginal places have been declared in or near the above location. ***

ID	Aboriginal Place Name
59	Blackfellows Hand

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Donkey Steps

Client Service ID : 735364

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-1-0254	WG-RS-2;	AGD	56	231650	6309380	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		
45-1-2855	APW-IF2	GDA	56	231268	6309437	Open site	Valid	Artefact : -		
	Contact	**Recorders**	EMM Consulting - St Leonards - Individual users,Ms.Taylar Reid					**Permits**		
45-1-0253	BH-IF-1;	AGD	56	231500	6309150	Open site	Valid	Artefact : -	Isolated Find	
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		
45-1-2555	WG-RS-3	AGD	56	231520	6309370	Closed site	Valid	Art (Pigment or Engraved) : -, Artefact : -	Shelter with Art,Shelter with Deposit	
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		
45-1-0007	Blackfellows Hand Rock;Wolgan Gap;	AGD	56	231700	6308990	Closed site	Valid	Art (Pigment or Engraved) : -, Artefact : -	Shelter with Art,Shelter with Deposit	809
	Contact	**Recorders**	Ann Jelinek					**Permits**		
45-1-0046	Wolgan Gap;Blue Mountains;	AGD	56	231800	6309360	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Ann Jelinek					**Permits**		
45-1-0255	WG-RS-1A	AGD	56	231890	6309350	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		
45-1-2871	APW-AS1	GDA	56	231185	6309299	Open site	Valid	Artefact : -		
	Contact	**Recorders**	EMM Consulting - St Leonards - Individual users,Ms.Taylar Reid					**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 24/11/2022 for Janet Sanderson for the following area at Lat, Long From : -33.3237, 150.1065 - Lat, Long To : -33.299, 150.1276. Number of Aboriginal sites and Aboriginal objects found is 8

Appendix D – Summary of Environmental Safeguards

Safeguards to be implemented and maintained for Soils and Erosion include:

Construction

- No vegetation outside the approved direct impact footprint is to be harmed or removed; native 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 water course, drainage lines, or drain inlets, 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.
- Stockpiles and machine parking will be on private property or in existing cleared areas along the road reserve, to reduce impacts to ground covers and adjacent vegetation from sediment migration.
- Monitoring and response actions with regards to ERSED controls will need to be incorporated within the Construction Environmental Management Plan (CEMP) and Environmental Control Plan (ECP) for the project.
- Vehicles are to use existing roadways and formed access where possible to prevent additional damage to the site, and to reduce the risk of tracking of sediments offsite.
- Works areas are to be stabilised using the most appropriate combination of the following measures, as soon as possible following disturbance:
    - Planting of native tubestock to replace removed large trees and other woody vegetation.
    - Hydromulching, turfing or seeding with appropriate species on exposed areas including over concrete paved sections of trail; and / or
    - Sealing exposed areas with appropriate material, e.g. concrete emulsion, road base or asphalt.
- Sediment fences / strawbale filters or equivalent must 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). Including:
    - Stockpiles are recommended to be formed in accordance with the Blue Book Standard Drawing 4-1, and offsite/outside the riparian zone 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 stabilisation works, e.g. re-spreading of topsoil 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 / stabilisation 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 ground-cover mixture and/or mulch to be undertaken by Council during the 12-month establishment period until the planting areas are stabilized. Infill planting and maintenance will then be handed over to Council to ensure long-term stability of the site.

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

Safeguards to be implemented and maintained for Surface and Ground waters 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.
- Works to be completed in dry times whenever possible (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 and drainage lines.
- All litter, including cigarette butts and food wrappers, is to be collected in a suitable receptacle and disposed of appropriately throughout the construction phase.
- Re-fueling 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. Portable spill kits and secure couplings may be used to refuel machinery if needed in less accessible parts of the site to ensure pollutants are not left to wash downstream and impact aquatic environments.
- Vehicle wash-down and/or cement truck washout (if required) is to occur offsite, where it is to occur in a suitably bunded area with controlled run-off.
- Visual 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, coir logs and holding ponds to prevent stockpile runoff from entering waterways.
- Minimise 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 or 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).
    - 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 project, detailing:
    - Water quality parameters to be adhered to
    - Appropriate monitoring locations and frequency
    - Location and types of ERSED controls
    - Proposed revegetation and stabilisation measures to be undertaken
    - Stockpile management provisions.

Operation

- Continue to undertake a water quality and quantity monitoring program in line with Council's requirements until the site is completely stabilised; monitoring should include details of proposed baseline and downstream water quality following any heavy rainfall.
- Subject site rehabilitation, including removal of weeds and subsequent revegetation using appropriate native species, to be undertaken to ensure soil stability and prevention of sediment runoff from the site into the future.

Impacts associated with Surface and Groundwater will not be significant if the above Safeguards are 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)
- Typically, noise impacts to the local community will be limited to recommended standard working hours as detailed in the Interim Construction Noise Guideline 2009 (ICNG) where

possible. However, due to the urgent nature of the works, 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 7:00pm 7 days per week,
No work on 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 one (1) week prior to works starting. Communication must inform residents of planned construction activities, time periods and expected durations, potential impacts, proposed mitigation measures and contact details of site management.
- Communication of intentions and timeframes will be made to neighbouring properties to minimise misconceptions, uncertainty and negative reactions to noise. The site supervisor should supply a contact number to aid in community liaison.
- All noise and vibration complaints are to be handled in a timely manner and monitoring is to be implemented in response to any complaints received.
- The appointed contractor will incorporate Noise and Vibration Management strategies in the CEMP and throughout project delivery, 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) as applicable.
- Plant deliveries and site access will occur quietly and efficiently, with parking allowed only within designated areas located away from nearby sensitive receivers and private property.
- Simultaneous operation of high-level noise generating machinery should be avoided where possible by operating at contrasting times or increasing the distance between the plant and the nearest identified receiver, including identified nesting native species.
- High noise generating activities, such as jack hammering, should be carried out in continuous blocks, not exceeding three (3) hours with a minimum respite period between blocks of one (1) 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, except by prior arrangement.
- Contractors and project managers to make reasonable efforts to time works to avoid and/or minimise noise impacts during prime breeding season (Spring) for the majority of native species residing in the area which may be sensitive to noise and vibration during breeding and fledging.
- Strong community reaction may occur where the noise levels reach 75 dB, known as the highly noise affected level. If this level is reached, respite periods may be enforced, and community consultation is to occur to determine least sensitive periods and/or if the community is prepared to accept a longer construction period in exchange for restrictions on construction times.

Operation

No further Safeguards were considered necessary for the operation phase of the project. Operation of the road is not likely to result in any significant ongoing noise impacts as use of the bypass road will be limited to light 4WD vehicles.

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

Safeguards to be implemented and maintained for Air Quality include:

Construction

- Council must continue to undertake community engagement and liaison, to set expectations for the works schedule and likely air quality 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. Regular site inspections will be undertaken as part of air quality monitoring, and inspection results recorded by Council's Principal Contractor.
- Provide an adequate water supply on the construction site for effective dust / particulate matter suppression / mitigation; due to the steep and inaccessible nature of this site, this may be via a water tank on a 4WD vehicle. If synthetic dust suppressants are used, they must be biodegradable in nature and non-toxic for waterways.
- Earthworks and exposed areas of soil are to be stabilised using compactible material or revegetated using appropriate native 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, such as leftover material at construction completion, through urban areas 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 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 Contractor's logbook.

Operation

- Council is to conduct regular road maintenance activities to ensure the road surface doesn't deteriorate, resulting in emissions to air.
- Any exposed areas revegetated during construction are to be monitored and maintained until the areas are fully stabilised to reduce risk of erosion and dust emissions, as well as dust settling on nearby native vegetation.

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

Safeguards to be implemented and maintained for Non-Aboriginal Heritage include:

- The proposed works must be contained to the area assessed during the construction. If the proposed location is amended, further archaeological assessment may be necessary to determine if the proposed works will impact any items of historical significance.
- 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. Including historical stonework on the Donkey Steps Track not identified on the heritage register.
- Any newly discovered 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.

Safeguards to be implemented for Aboriginal Heritage are:

- All staff and visitors should be inducted to site to ensure they are aware of the possible presence of sensitive Aboriginal heritage items located within the vicinity of the work site, and the protective measures that should remain in place throughout the works.
- The due diligence assessment (Appendix C) must be kept by Lithgow City Council so that it can be presented, if needed, as a defence from prosecution under Section 86(2) of the National Parks and Wildlife Act 1974
- Should unanticipated archaeological material be encountered during site works, all work must cease and an archaeologist contacted to make an assessment of the find. Further archaeological assessment and Aboriginal community consultation may be required prior to the recommencement of works. Any objects confirmed to be Aboriginal in origin must be reported to Heritage NSW.
- The proposed works must be contained to the area assessed during this archaeological assessment, as shown on Figure 1. If the proposed location is amended, further archaeological assessment may be necessary to determine if the proposed works will impact any Aboriginal objects or archaeological deposits.
- If sub-surface Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Council's Manager Strategic Planning and Manager Environment or an archaeologist are to be contacted immediately. Works in the vicinity of

the find must not re-commence until clearance has been received from those Council officers and the NSW Office of Environment & Heritage. Further archaeological assessment and Aboriginal community consultation may be required prior to the recommencement of works.

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

Safeguards to be implemented and maintained for Biodiversity include:

Timing of Vegetation Clearing

- Where practicable, it is recommended to time the works outside of key breeding season (Spring) for the majority of native species likely to utilise the site for breeding to avoid nest abandonment, injury or death to native fauna.
- Preclearing surveys should be completed immediately prior to vegetation clearing commencing to determine which species are utilising the site at the time of works.

Tree Removal

- Preclearing surveys must be undertaken prior to the commencement of any clearing works.
- Clearly delineate vegetation to be removed/retained by a qualified arborist with the assistance of an ecologist, or similarly qualified professional, and induct all site personnel as to the approved extent of clearing. Ensure that no clearing of vegetation occurs outside of the marked boundary and retain mature trees and overhanging limbs wherever possible.
- Where any trees requiring removal contain hollows, nests or other signs of occupation, a two-staged clearing approach must be undertaken (see below)
- Ensure the presence or availability of an ecologist or fauna spotter catcher at all times during pre-clearing and clearing activities to remove and relocate wildlife as necessary, and to immediately attend to any wildlife that are injured as a result of works.
- Where possible felled trees and removed logs should be placed strategically and in proximity to the work site to provide refuge and potential habitat in the understorey whilst ensuring no further damage to surrounding vegetation. Placement of logs and felled trees will also aid in the regeneration of the area.
- Where additional vegetation removal is proposed this must first be assessed to consider the cumulative impacts against the approved clearance footprint, and if appropriate supervised by a qualified ecologist.

Two-stage clearing process

Vegetation clearing should be staged, commencing with the most disturbed vegetation in the north of the site and progressing south to increase the opportunity for fauna to vacate the site and disperse into areas of adjoining habitat to evade injury.

- Pre-clearing surveys process are to be undertaken immediately prior (within 24 hours) of vegetation clearing by a suitably qualified and appropriately licenced ecologist to identify any habitat present
- If animals or animal habitat are found, or suspected to be present, procedures outlined in the protocol for capture and relocation (below) will be followed.

- After all habitat vegetation is identified and appropriately marked (i.e with an 'X' or with flagging tape), surrounding non-habitat vegetation can then be cleared.
- If no fauna are found, then surrounding non-habitat vegetation can be cleared. This process will be monitored by the ecologist in case fauna are found to be at risk.
- The ecologist will document the outcomes of this process (e.g. number and species encountered/rescued).
- A wildlife rescue organisation (e.g. WIRES) should be made aware of operations in case any injured fauna are found. All animals encountered will be treated humanely, ethically, and in accordance with relevant codes under the NSW Prevention of Cruelty to Animals Act 1979
- At the completion of non-habitat vegetation clearing, the site will be left overnight (at least 12 hours) to allow for any nocturnal resident fauna to escape overnight.

Capture and relocation process

One day after the clearing of non-habitat vegetation (as per above), the site can be cleared of habitat vegetation.

For habitat and hollow-bearing trees expected or known to contain fauna (all trees marked with an "X") are to be felled in accordance with the procedure detailed below:

- A suitably qualified and experienced ecologist will be present, with appropriate animal-handling equipment and holding containers.
- Prior to felling or removal, clearing machinery will be used to gently shake or 'bang' the habitat tree for a period of 2-3 minutes (dependant on tree health and structural integrity) to encourage any resident fauna to vacate hollows. Sticks, poles or other similar hand-held objects will also be used to hit the trunk of the tree or log at various points, to encourage animals to vacate the tree. The tree will be observed for at least 5 minutes prior to completing this action.
- After the observation period, trees will be gently lowered/felled using an excavator bucket or dozer blade for support if possible. The ecologist will observe the tree felling and ensure that any hollows are not blocked by being placed against the ground.
- Once deemed safe by the plant operator, the ecologist will inspect each tree and hollows for fauna that may be present (uninjured, injured or deceased). Use of fibre-optic cameras to assist this process is recommended. The ecologist will document this process using the tree hollow inspection register.

Rehabilitation

- All tree hollows removed are to be replaced with artificial hollows (nest boxes or augmented hollows) at a rate of 2:1. The size of nest box entrances is to be suited to the requirements of the threatened species that occupy the area/matched to those that have been removed. Nest boxes should be erected near the habitat to be removed in a suitable position prior to the commencement of vegetation clearing works. The project ecologist should be consulted to determine appropriate type, size and number to be erected.
- Any required revegetation activities will be undertaken using native species sourced from local seed wherever possible. 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 clearing to reduce soil exposure and loss.

General

- Vehicles and machinery to work from the sealed road and are not to extend beyond the direct impact footprint.
- All soils to be stockpiled at designated stockpile locations 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.
- Where possible, 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. Existing verges and cleared areas are to be used for parking as a first priority.
- 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.
- Strict hygiene protocols, including vehicle inspections, washdown and toolbox talks addressing weed management, must be followed to ensure that no environmental weeds 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.
- Declared weeds must be managed according to requirements under the Biosecurity Act 2015. It is recommended that 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.

Safeguards to be implemented and maintained for Traffic and Transport include:

Construction

- Prior notice shall be given to affected landowners along to notify residents of the works to be completed, their timing and duration as well as any closures due to construction, if required. Notification can be provided by various means including letterbox distribution, local paper and through the Council website. Given the works are to be implemented at short notice, door-knocking or contact by telephone may be feasible and can be preferable in this situation. All consultation and notification should occur with enough time before works to allow residents to make travel plans (1 – 2 weeks prior to commencement).
- Council's appointed contractor will consider the location of designated parking areas, stockpile locations, construction laydown sites, site offices, and access routes carefully with regard to creating inconveniences to residents, and to the other environmental constraints.
- A Traffic Control Plan (TCP) is to be developed in accordance with Australian Standards (AS 1742.3 – Traffic Control Devices for Works on Roads) and Roads and Maritime Traffic Control at Worksites manual to identify appropriate signage (and location) to advise motorist of upcoming changes in the road network (if applicable). Any variation to the layout of the TCP on site is to be recorded and certified by accredited TfNSW personnel.
- All road signs and marking will be in accordance with the TfNSW 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.

Safeguards to be implemented and maintained for Socio-economic Considerations include:

- 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 project 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 project, including design and construction to ensure best value for the local community.
- Disruption of traffic / private property access 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 Impacts associated with Socio-economic Considerations will not be significant if the above Safeguards are implemented and maintained.

Safeguards to be implemented and maintained for Waste and Resource Use include:

All wastes generated as part of this project 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/assessment may 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 DPE 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.

The Impacts associated with Waste and Resource Use will not be significant if the above Safeguards are implemented and maintained.

Safeguards to be implemented and maintained for Visual Amenity include:

Construction

- Considerate construction practices are to be implemented at all times, to ensure the works areas are neat and visually not offensive, including to be kept free from rubbish, and stockpile sites actively managed.
- No additional, unauthorised clearing or destruction of vegetation is to occur.
- Vehicles are to be parked in designated areas only.
- 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.
- Appropriate consultation will continue to be undertaken to inform businesses and residents of planned works, timing, and potential visual impacts.
- Any complaints received regarding visual amenity at the site are to be dealt with and rectified as soon as possible.

Operation

- Cleared, bare patches 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.
- Any impacts to property entrances, driveways or fencing are to be rectified in collaboration with the landholder/s as soon as possible, post completion of works in the vicinity.

The Impacts associated with Visual Amenity will not be significant if the above safeguards are implemented and maintained.

Safeguards to be implemented and maintained for Climate Change include:

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),
    - Disposal is undertaken as a last resort (in accordance with the *Waste Avoidance & Resource Recovery Act 2001*).
- Council may elect to make a contribution to green power to offset greenhouse gas emissions.
- 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

- Road and culvert upgrades to be monitored and maintained per Council's routine road management strategy, to ensure lifecycle of upgraded road features extended and to reduce wastage from neglect / inadequate maintenance.

The Impacts associated with Climate Change will not be significant if the above safeguards are implemented and maintained.