Roads and Maritime Services

Kosciuszko Road (MR286) Barry Way to Alpine Way Lane Addition

Review of environmental factors
July 2017

Prepared by EnviroKey Pty. Ltd

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Executive summary

The proposal

Roads and Maritime Services (Roads and Maritime) propose to build an additional westbound lane on Kosciuszko Road between Barry Way and Alpine Way. The total length of the proposal would be about 1.6 kilometres. The proposal is located on the western outskirts of Jindabyne, (refer to Map 1-1 and 1-2) in the Snowy Monaro Regional Council local government area (LGA), previously the Snowy River LGA.

Key features of the proposal would include:
- Building an additional westbound lane between Barry Way and Alpine Way
- The relining and extension of several culverts and repair of existing road
- Improving the stability to two large cutting batters through benching, scaling and blasting
- Vegetation clearing
- Installation of new guardrail, kerb and gutter
- Landscaping and stabilisation work.

A detailed design of the proposal is located in Appendix 1.

Need for the proposal

This section of Kosciuszko Road is the main route for all traffic travelling from NSW to the snow fields between June and October. During the snow season this section of road sees a large volume of traffic in the westbound direction in the morning as road users travel up to the snow fields.

East of the Barry Way roundabout, Kosciuszko Road consists of two westbound lanes, which merge to one lane 200 metres west of the roundabout. This merge to one lane creates a bottleneck. In the peak season this causes lengthy queue delays during the morning peak and severely limits traffic efficiency within the Jindabyne road network.

In order to significantly improve traffic efficiency around Jindabyne and Kosciusko Road, an additional lane is proposed for westbound traffic to remove this ‘bottle necking’ easing traffic congestion around Jindabyne and Barry Way during morning peak traffic periods.

Proposal objectives

The proposal objectives are to:
- Improve traffic efficiency
- Rehabilitate the existing road surface
- Extend and rehabilitate several culverts
- Minimise direct environmental impact.

Options considered

Four options were identified and considered as part of the proposal to improve traffic efficiency on Kosciuszko Road at Barry Way.

Option 1 – ‘Do Nothing’

The do nothing option involves not carrying out the proposal, continuing to use Kosciuszko Road in the current formation with identified traffic issues. The advantage of this option would be that there are no construction costs and no impacts on the environment or community. The disadvantage would be that traffic efficiency would not be improved.
Option 2 – Widen the road on both the eastbound and westbound lanes
This option would widen the road on both the eastbound and westbound side of the road to accommodate an additional westbound lane. Advantages of this option include improvements to traffic efficiency and slight improvements to safety. Disadvantages include higher impacts on vegetation and community, high construction costs and greater impacts to road users during construction.

Option 3 – Widen the road on the westbound lane only
This option would widen the road on the westbound side of the road to accommodate an additional westbound lane. Advantages of this option include improvements to traffic efficiency, relatively low impact on vegetation and community, reduced impact on road users during construction and lower construction costs. Disadvantages include higher amount of excess spoil generated and no safety improvements made to eastbound lanes.

Option 4 – Traffic flow management in morning during snow season
This option would not construct a new lane, but instead use traffic control and traffic management methods to utilise the existing three lanes and manage traffic flows in either direction during the morning peak to increase capacity. Advantages of this option include no construction costs, no disruptions caused by construction and no environmental impacts. Disadvantages of this option are that the long term costs would outweigh the cost to construct an additional lane, there are higher risks to worker health and safety during operation, and the risk of plant and equipment malfunction during operation could adversely impact traffic efficiency.

Option 3 is the preferred option as it best meets the proposal objectives and is considered to be the safest and most efficient option in terms of constructability. This option would have some impact on vegetation and the surrounding environment. However, this option would have the least cost and minimises the traffic impact during work.

Statutory and planning framework
The State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposal is for the purpose of a road and is to be carried out by Roads and Maritime, it can be assessed under Part 5 of the Environmental Planning and Assessment Act 1979. Development consent is not required.

Community and stakeholder consultation
All necessary community and stakeholder consultation would be carried out by Roads and Maritime, in accordance with the Roads and Maritime Community Involvement Practice Notes and Resource Manual and in accordance with ISEPP.

Community consultation would be carried out as part of this proposal, including:

- Notifications would be placed in local print media before work, detailing the likely timing of the proposal, potential changes to traffic conditions and project management contact details to open communication channels to provide further details or address complaints
- Temporary electronic Variable Message Signs (VMS) placed at both the northern and southern ends of the proposal to advise of the project and potential delays to motorists
- Meetings and briefings with stakeholders, businesses and residences (as required)
- Letters, phone calls, emails and targeted correspondence
The Bega Local Aboriginal Land Council has inspected the site for Aboriginal objects and cultural significant areas. No Aboriginal objects or places have been identified.

Roads and Maritime has carried out community and stakeholder consultation prior to this proposal going on public display, including consultation with National Parks and Wildlife Services, Snowy Monaro Regional Council, local business and affected property owners.

**Environmental impacts**

Native and exotic vegetation would be removed as part of this proposal. About 0.41 hectares of native vegetation would be removed, all of which is identified as the threatened ecological community Snow Gum Grassy Woodland under the TSC Act. This removal has been assessed to not constitute a significant impact. The remaining impact would be restricted to planted vegetation and introduced vegetation.

There was no direct potential impact to threatened fauna species, populations, communities and their habitats identified as part of the proposal. Indirect impact includes the removal of some native and introduced vegetation which is considered potential foraging areas for some threatened fauna species. No hollow-bearing trees would be impacted as part of the proposal. There is also the potential for the proposal to result in the spread of weed species.

No Aboriginal objects or places were identified during the field investigation. No Aboriginal objects or places were identified and no previously identified Aboriginal heritage items would be impacted by the proposal. Lake Jindabyne is listed in the Snowy River LEP 2013, the State Heritage Register and the Australian Heritage Register but would not be impacted by the proposal.

During work there would be temporary noise and traffic impacts. There would also be potential for water quality impacts.

The implementation of safeguards and management measures would minimise or avoid the identified potential impacts. The safeguards are summarised in table 7-2, section 7 of this review of environmental factors. The key safeguards are:

- All businesses and residences likely to be affected by the proposed work must be notified at least 10 working days prior to the commencement of the proposed activities.
- Exclusion zones must be established around any areas of Threatened ecological communities (TEC) that are outside the limit of clearing.
- Erosion and sediment control measures must be implemented and maintained to:
  - Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets.
  - Reduce water velocity and capture sediment on site.
  - Minimise the amount of material transported from site to surrounding pavement surfaces.
  - Divert clean water around the site.
  (in accordance with the Landcom/Department of Housing *Managing Urban Stormwater, Soils and Construction Guidelines* (the Blue Book 1 &2))
- Current traffic movements and property accesses must be maintained during the work, where possible.
- A traffic management plan must be prepared in accordance with the Traffic Controls at Work Sites Manual be prepared prior to work commencing and must accommodate the needs of planned community events.
- Construction noise and vibration impacts will be managed in accordance with a Noise Management Plan prepared with consideration of the Roads and Maritime *Construction Noise and Vibration Guideline*

There would be no ongoing impacts to other environmental factors considered in this REF.
Justification and conclusion

The review of environmental factors has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity. The proposal would result in both positive and negative impact. Safeguards are identified in this review of environmental factors to manage and mitigate the identified negative impact.

On balance, it is considered the adverse environmental impact of the proposal is outweighed by the useful effects and the proposal is therefore justified. This review of environmental factors has determined the proposal is unlikely to have a significant impact on the environment and an Environmental Impact Statement is not required.

Display of the review of environmental factors

This review of environmental factors is on display for comment between Friday 28 July and Friday 18 August 2017. Any changes to these dates will be listed on the project website. You can view the documents in the following ways:

Internet

Display
The review documents can be viewed at the following locations:

- Snowy Monaro Regional Council Jindabyne Office
- Jindabyne Visitor Centre

Hard Copies
Hard copies of the review of environmental factors can be provided upon request. Please contact the Roads and Maritime project manager, Shaun Foster on 1800 771 546 or shaun.foster@rms.nsw.gov.au.

How can I make a submission?

To make a submission on the proposal, please send your written comments to:

Roads and Maritime Services project manager
Shaun Foster
PO Box 477
Wollongong NSW 2520

Submissions must be received by 18 August 2017

Privacy information

All information included in the submission is collected for the sole purpose of assisting in the assessment of this proposal. The information may be used during the environmental impact assessment process by relevant Roads and Maritime staff and its contractors.

Where the respondent indicates at the time of supply of information that their submission should be kept confidential, Roads and Maritime will attempt to keep it confidential. However, there may be legislative or legal justification for the release of the information, for example under the Government Information (Public Access) Act 2009 or under subpoena or statutory instrument.
The supply of this information is voluntary. Each respondent has free access at all times to the information provided by that respondent but not to any identifying information provided by other respondents if a respondent has indicated that the representation should be kept confidential.

Any respondent may make a correction to the information that they have provided by writing to the same address the submission was sent.

The information will be held by Roads and Maritime, 90 Crown Street, Wollongong NSW 2500.

**What happens next?**

Following the submissions period, Roads and Maritime will collate submissions with acknowledgement letters sent to each respondent. The details of submission authors will be retained and authors will be subsequently advised when project information is released.

After consideration of community comments Roads and Maritime will determine whether the proposal should proceed as proposed, or whether any alterations to the proposal are necessary. The community will be kept informed about the determination and project as it progresses.

Following approval to proceed, Roads and Maritime will progress with final design and construction of the project.

If you have any queries, please contact the Roads and Maritime project manager on 1800 771 546.
1 Introduction

1.1 Proposal identification

Roads and Maritime Services (Roads and Maritime) propose to construct an additional westbound lane on Kosciuszko Rd between Barry Way and Alpine Way. The total length of the proposal would be about 1.6 kilometres. The proposal is located on the western outskirts of Jindabyne, (refer to Map 1-1 and Map 1-2) in the Snowy Monaro Regional Council (SMRC) local government area (LGA), previously the Snowy River LGA.

This section of Kosciuszko Road is the main route for all traffic travelling from NSW to the snow fields during the snow season between June and October. During the snow season this section of road sees a large volume of traffic in the westbound direction in the morning as road user’s travel up to the snow fields. In the evening, the eastbound direction experiences a large volume of traffic as road users leave the snow field, however, this traffic is serviced by two lanes through to Jindabyne.

East of the Barry Way roundabout, Kosciuszko Road consists of two westbound lanes, which merge to one lane 200 metres west of the roundabout. This merger to one lane creates a bottleneck. In the peak season this causes lengthy queue delays during the morning peak and severely limits traffic efficiency within the Jindabyne road network.

In order to significantly improve the traffic efficiency around Jindabyne and Kosciusko Road an additional lane is proposed for westbound traffic to remove this ‘bottle necking’ easing traffic congestion around Jindabyne and Barry Way during morning peak traffic periods.

Key features of the proposal would include:
- Constructing an additional westbound lane between Barry Way and Alpine Way (approximately 1.5 kilometres), constructed wholly within the westbound side of the road
- The relining and extension of several culverts and rehabilitation of existing road
- Improving the stability to two large cutting batters through benching, scaling and blasting
- Clearing about 0.41 hectares of native vegetation
- Installation of new guardrail, kerb and gutter.

Further detail of the project design is shown in Appendix 1.

1.2 Purpose of the report

This Review of Environmental Factors (REF) has been prepared by EnviroKey on behalf of Roads and Maritime Services Southern region. For the purposes of this work, Roads and Maritime is the proponent and the determining authority under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The purpose of the REF is to describe the proposal, to document the likely impacts of the proposal on the environment, and to detail protective measures to be implemented.

The description of the proposed work and associated environmental impact have been carried out in context of clause 228 of the Environmental Planning and Assessment Regulation 2000, the Threatened Species Conservation Act 1995 (TSC Act), the Fisheries Management Act 1994 (FM Act), and the Australian Government’s Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). In doing so, the REF helps to fulfil the requirements of section 111 of the EP&A Act that Roads and Maritime Services examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the REF would be considered when assessing:
• Whether the proposal is likely to have a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Part 5.1 of the EP&A Act
• The significance of any impact on threatened species as defined by the TSC Act and/or FM Act, in section 5A of the EP&A Act and therefore the requirement for a Species Impact Statement (SIS)
• The potential for the proposal to significantly impact a matter of national environmental significance (NES) or Commonwealth land and the need to make a referral to the Australian Government Department of the Environment for a decision by the Commonwealth Minister for the Environment on whether assessment and approval is required under the EPBC Act.
Map 1-1: Regional location of the proposal.
Map 1-2: Location of the proposal.
2 Need and options considered

2.1 Strategic need for the proposal
This section of Kosciuszko Road sees a large volume of traffic in the westbound direction in the morning during the snow season as road user’s travel up to the snow fields. The current formation results in a bottleneck that severely limits traffic efficiently. The road surface and existing drainage is also in poor condition.

2.2 Existing road and infrastructure
Kosciuszko Road at Barry Way consists of two lanes in the westbound direction, which merges to one lane 200 metres west of Barry Way and two lanes in the eastbound direction. The speed limit is 80 kilometres per hour.

The road formation is serviced by numerous culverts that would require extension including one four cell culvert at Widow Creek. There is also one main intersection at the entrance to the Essential Energy Jindabyne Depot which would require an upgrade. Access to the Lake Jindabyne Sailing Club would be maintained.

An established SMRC stockpile site at Leesville industrial area located 2.6 kilometres south of the proposal would be utilised.

2.3 Proposal objectives
The proposal objectives are to:
- Improve traffic efficiency
- Rehabilitate the existing road surface
- Extend and rehabilitate several culverts
- Minimise direct environmental impacts.

2.4 Alternatives and options considered

2.4.1 Methodology for selection of preferred option
The method used for the selection of the preferred option was to analyse the environmental, community, financial and safety outcomes of each option and whether they achieved the objectives of this proposal. The option which best achieved the outcomes was the selected option.

2.4.2 Identified options
Four options were identified and considered as part of the proposal to improve traffic efficiency on Kosciuszko road at Barry way.

Option 1 – ‘Do Nothing’
The do nothing option involves not undertaking the proposal, continuing to use Kosciuszko Road in the current formation with identified traffic issues.

Option 2 – Widen the road on both the East and Westbound lanes
This option would widen the road on both the eastbound and westbound side of the road to accommodate an additional westbound lane.

Option 3 – Widen the road on the westbound lane only
This option would widen the road only on the westbound side of the road to accommodate an additional westbound lane.
Option 4 – Active contraflow in morning during snow season.
This option would not construct a new lane, but instead use active traffic control and traffic management methods to utilise the existing three lanes and contraflow traffic in either direction during the morning peak to increase capacity.

2.4.3 Analysis of options
Option 1 – ‘Do Nothing’

The ‘do nothing’ option would not meet the proposal objectives and would not result in any improvement to traffic efficiency on Kosciuszko Road at Barry Way.

Advantages:
• No impact on vegetation and the surrounding environment
• No community impact due to temporary traffic disruptions
• No construction costs.

Disadvantages:
• Traffic efficiency on Kosciuszko Road around Jindabyne and Barry Way would not be improved.

Option 2 – Widen the road on both the eastbound and westbound side of the road

Option 2 would meet all of the objectives of the project, however, additional work would be required outside the proposal objectives which would increase the cost of the project without increasing the ability to meet the objective.

Advantages:
• Traffic efficiency would be improved with an additional westbound lane
• Safety would be slightly improved due to the improved lane widths on all lanes and shoulder widths.
• Maintains a cut-fill balance, re-using all excess spoil.

Disadvantages:
• Higher relative impact on vegetation and community
• Higher construction costs
• Impacts on access to Lake Jindabyne sailing club
• Greater impacts to road users during construction

Option 3 – Widen road on the westbound side of the road

Option 3 would meet all of the objectives of the project with the least amount of whole of life costs. This option would widen the road on the westbound side to accommodate an additional lane.

Advantages:
• Traffic efficiency would be improved with an additional westbound lane
• Low relative impact on vegetation and community
• Reduced impact to road users during construction
• Low construction costs.

Disadvantages:
• Higher amount of excess spoil generated
• No safety improvements made to the eastbound lanes.

Option 4 – Active contraflow in morning during snow season.
Option 4 would meet the proposal objectives of improving traffic efficiency during the snow season, however it has less benefit in the long term and comes with higher road user and worker safety risks while in operation. If traffic barriers were used, the road would likely not be wide enough to allow for traffic barriers and required clear zones from median barriers.

Advantages:
- No construction costs
- Low initial cost
- No disruptions caused during construction
- No environmental impacts.

Disadvantages:
- In the long term this option would outrun the cost to construct an extra lane
- Additional work would likely be required to allow enough road width to allow for median barriers
- This option has higher risks to WHS during operation
- This option has risks during operation due to plant and equipment malfunction which would adversely impact traffic efficiency.

2.5 Preferred option

Option 3 was the preferred option as it best meets the objectives of the proposal. This option would have some impact on vegetation and the surrounding environment. This option would also have the least cost while still meeting the proposal objectives. The impacts were deemed acceptable due to the vast improvements that would be made to traffic efficiency on Kosciuszko Road with consideration of the ‘integration’ principle of ecologically sustainable development (ESD).

2.6 Design refinements

The design has been refined to minimise the extent of clearing, the amount of cut volume and treatment of earthworks, as well as minimise impacts to biodiversity. The design of culverts around drainage lines has also been refined.
3 Description of the proposal

3.1 The proposal

Roads and Maritime propose to construct an additional westbound lane on Kosciuszko Rd between Barry Way and Alpine Way in order to improve traffic efficiency (Map 1-1).

The proposal would include:

- An additional westbound lane between Barry Way and Alpine Way (approximately 1.5 kilometres), constructed wholly within the westbound side of the road.
- The relining and extension of an existing four cell, 1500 millimetres diameter culvert, including inlet and outlet scour protection treatment.
- Culvert extensions and replacements:
  - One 1200 millimetre concrete culvert.
  - One 750 millimetre concrete culvert.
  - One 600 millimetre concrete culvert.
  - One 450 millimetre concrete culvert.
- Improving the stability to two large cutting batters through benching, scaling and blasting.
- The acquisition of small parcels of land (including adjustments to fencing) to allow for increased road width and large cutting batters.
- Clearing approximately 0.41 hectares of native vegetation and 2.88 hectares of non-native vegetation
- Possible relocation of one power pole.
- Installation of new drainage blanket and subsoil drainage.
- Installation of new guardrail.
- Installation of about 1,000 metres of kerb and gutter.
- Provision for a site compound and ancillary work areas.
- Rehabilitation of the existing road, consisting of 150mm gravel overlay.

3.2 Design

3.2.1 Design criteria

The design criteria for the proposed work are to:

- Improve traffic efficiency by providing an additional westbound lane in order to ease congestion in the westbound direction during peak periods.
- Rehabilitate the existing road surface with a gravel overlay, effectively increasing the pavement level by approximately 150 millimetres.
- Rehabilitate the existing four cell culvert with a liner and extend or replace other culverts within the proposal site.

Detailed plans and cross-sections of the proposal are provided in the concept construction plans (Appendix 1).

3.2.2 Engineering constraints

Engineering constraints related to the proposal include:

- Steep topography creating the need for large cut batters, and a cut-fill in-balance, resulting in excess spoil
- Hard granite rock boulders scattered around the surface and subsurface cuttings, creating an unknown environment and the potential need for blasting
- Drainage blanket may be required to treat the foundation of the new lane.

3.2.3 Major design feature

The major design features for the proposal include:
The additional westbound lane – The largest design feature for the proposal is the inclusion of an additional westbound lane between Barry Way and Alpine Way.

Rehabilitation and extension of an existing triple cell 1500 millimetre culvert – Due to the existing culvert nearing the end of its service life, a rehabilitation of the existing culvert structure is required, prior to extending the culvert to allow for the additional formation width to fit the additional lane.

Rehabilitation of the existing road surface – The segment of road between Barry way and Alpine way is nearing the end of its service life, requiring rehabilitation through a 150 millimetre gravel pavement overlay.

Two large Granite cuttings with benching – Due to the steep topography, two large cuttings are required in a hillside consisting of mostly granite rock.

3.3 Construction activities

3.3.1 Work methodology

The general construction activities for the proposal include:

- Establish traffic control, including partial road closures
- Slash grass within project footprint
- Install environmental controls, including erosion and sediment controls
- Site establishment, including establishment of site compound and associated stockpiles
- Clear and grub
- Remove of topsoil, unsuitable material and minor vegetation
  - Windrow the topsoil to form a bund. Use mulched vegetation where available
  - Mulch vegetation and re-incorporate into the work as either bunds or ground stabilisation
- Remove boulders up to 15m beyond the tops of cuttings
- Remove trees around Widows Creek culvert
- Rehabilitate the existing Widows Creek culvert with an RMS approved liner
- Extend Widows Creek culvert in the upstream direction by 15m to allow for a wider fill formation in order to facilitate the additional lane.
- Remediate Widows Creek outlet
- Cast insitu walls to the culvert extension
- Extend or replace all other culverts
- Excavate cuttings with excavators with rippers (approx. 15,000m³)
  - Drill and blast granite cuttings if required
  - Rockbolt and shotcrete steep cuttings if required
- Transport appropriate cutting material to Widows Creek fill batter, approx. 3,000m³
- Stockpile and process suitable cutting material for re-use on site as drainage rock or select material, approximately 4,000m³.
- Transport remaining excess spoil (about 13,000m³) to Snowy Monaro Regional Council stockpile site that would be transferred to council for re-use on council projects
- Excavate to foundation of the new pavement
- Place drainage blanket over excavated foundation if required
- Place and compact select material layer of new pavement (approximately 2,300m³)
- Excavate trench drains where required and backfill with Aggregate filter material wrapped in geofabric (approx. 1000m of trench drains)
- Form up and pour all SO kerbing (approx. 1000m)
- Place and compact Sub-base layer of the new pavement (approx. 8000m²)
- Remove existing wire rope on east bound lane
- Remove seal off the existing road (approx. 17,765m²) and provide to Snowy Monaro Regional Council for use in future projects
- Place and compact base layer (DGB20) over new pavement and existing pavement (approx. 24,000m³)
• Seal the pavement, re-instate existing guardrail and install new guardrail (Approx. 24,000m² of seal)
• Clean up site and rehabilitate disturbed areas
• Remove traffic control
• Demobilise from site

Some temporary stockpiles sites may also be required on already disturbed or cleared areas (i.e. non-native vegetation) and away from watercourses and drainage lines within the proposal site. The proposed compound site, and proposed ancillary work areas have been assessed as part of this REF.

3.3.2 Construction hours and duration
Work is expected to start in October 2017 and take about 55 weeks, ending in March 2019. Due to high volumes of traffic and adverse weather conditions, no work would be carried out during the snow season winter months between 10 June and the October long weekend 2018.

The working hours that would be adopted to carry out the work are as follows:

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<td>Monday – Sunday</td>
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<td>7:00am to 6:00pm</td>
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3.3.3 Plant and equipment
The following typical plant/equipment would be used during the proposed work:

- Trucks/tippers
- Loaders
- Excavators
- Bulldozers
- Rollers
- Rotor Mills
- Concrete trucks
- Cranes
- Light vehicles
- Water carts
- Grader
- Line markers

The following specific plant/equipment would also be used during the proposed work:

- Ripper
- Hydraulic hammer
- Drill and Blasting equipment
- Mobile screeners
- Rock crusher
- Dump trucks

3.3.4 Earthworks
The current concept design earthworks quantities are as follows:

- Topsoil quantity - 3,000m³ (300mm depth)
- Cut Quantity - 13,769 m³
- Fill Quantity - 2,816 m³
- Spoil - 10,953 m³

Potential material re-use options:

- Potential select fill re-use - 2,877 m³
- Potential drainage rock re-use - 2067 m³
- Potential Gabion rock re-use - 500 m³ (Widows creek rock fill)
- Total - 5,444 m³
Earthworks would consist primarily of cutting with very little fill. Geotechnical investigations have found the geology of the proposal site to consist of a mix of low strength to very high strength granite. Earthworks would generally be undertaken by excavators and dozers. Harder rocks may need to be ripped, and in some cases blasted.

Some rock would be suitable for processing into engineering materials for re-use within the proposal such as select material and drainage blanket rock. Processing would involve a mobile crusher and would be undertaken at an ancillary site within the proposal footprint or at Council’s Leesville stockpile site.

Excess material would be classified and managed according to the Roads and Maritime Technical Guide Management of Road Construction and Maintenance Wastes and relevant waste exemptions.

A Memorandum of Understanding (MOU) has been established with Snowy Monaro Regional Council whereby excess material would be transported to Council’s Leesville stockpile site, where it would be processed and stored for re-use in future projects in accordance with relevant waste exemptions.

### 3.3.5 Source and quantity of materials

Where possible materials would be sourced from onsite activities; earthworks, ripping the existing road etc. and used to construct the new road formation. However some material; fill, base, sub-base select gravel and bridging rock may be sourced from off site to meet Roads and Maritime specifications.

Concrete, steel, guardrail, etc. would be sourced from local commercial businesses where possible.

### 3.3.6 Traffic management and access

Traffic volumes in the study area are highly variable between summer and winter due to increased visitation in winter. Traffic counts in November 2014 recorded an Average Daily Traffic volume of 2,200. Within the proposal site one access is present on the eastbound side, used to access Lake Jindabyne Sailing club and the lake foreshore. The westbound side of the road contains one driveway access to an Essential Energy depot.

Traffic volumes would increase at the proposal site and in the Jindabyne region while construction is underway. Increased truck/vehicle movements would mostly be restricted to standard hours. However, some non-standard hours work is planned and elevated traffic volumes would occur during these periods.

A Traffic Control Management Plan would be prepared in line with the Roads and Maritime Traffic Controls and Work Sites Manual- Version 4 (2010). The work zone would be predominately on the westbound side of the road and would require a single lane closure and traffic barriers. Pavement rehabilitation would also require lane closure and traffic controls. Short term full stoppages would occasionally be required to safely undertake some activities and if blasting is being carried out. All accesses along the length of the proposal would remain open during construction.

Due to the high volumes of traffic during the snow season, construction activities would cease throughout winter 2018 between the June and October long weekends.

Heavy vehicle movement would increase over several weeks while material is hauled along Barry Way to and from the Leesville stockpile. This is not expected to significantly increase traffic volumes and would be consistent with the existing industrial land use of Leesville and congestion is not expected.
3.4 Ancillary facilities

A site compound, stockpile, sediment controls and other ancillary facilities would be required during construction. Potential sites have been identified for temporary site compound / stockpile site; these locations are (see Map 3-1):

- At the eastern end of the proposal on the northern and southern side of the road (opposite the school) (Figure 3-1)
- Snowy Monaro Regional Council Stockpile site (Leesville Stockpile Site) (Figure 3-2).

Construction compound sites and stockpile sites have been selected to avoid sensitive vegetation and utilise existing sites.

The site compound directly adjacent to the proposal would consist of:

- ATF Fencing around boundary
- Hard stand area
- Low noise generator
- Site Office
- Meal room and amenities
- Light vehicle parking and tyred plant parking over night

The site compound would be used primarily by light vehicles and occasionally a work crew truck.

Figure 3-1: Potential Site compound at the eastern end of the proposal
Additional ancillary sites would be selected using the following criteria:

- On an existing hard stand area, requiring minimal or no native vegetation clearing.
- At least 40 metres away from the nearest waterway.
- At least 100 metres away from receivers sensitive to noise.
- On relatively level ground.
- Outside the 1 in 10 year Average Recurrence Interval (ARI) floodplain and away from areas that could potentially have fast flowing water during flood events.
- Unencumbered by native plant species or cultural heritage artefacts.
- Away from identified areas of Aboriginal cultural significance.

### 3.5 Public utility adjustment

The proposal mostly contains adjacent electricity infrastructure consisting of power poles and power lines. These lines are mostly located outside the proposal footprint, however the work would possibly require the relocation of one power pole. There is one Telstra cable at Widows creek that may require re-location. Details of utilities and associated adjustments are provided in Appendix 1.

### 3.6 Property acquisition

The proposal would require three acquisitions of small parcels of land on the southern side to accommodate the large cut batters and culvert extension at Widows Creek. The required acquisitions or detailed in Table 3-1 and Figures 3-3 and Figure 3-4.

Property acquisition would be carried out in accordance with the Roads and Maritime *Land Acquisition Policy* and the *Land Acquisition (Just Terms Compensation) Act 1991*. 
Table 3-1: Proposed property acquisitions and leases

<table>
<thead>
<tr>
<th>Area ID</th>
<th>Description</th>
<th>Total area</th>
<th>Acquisition type</th>
<th>Current owner</th>
<th>Lot and DP</th>
<th>Land use zone (LEP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Cut 1</td>
<td>1352m²</td>
<td>Required acquisition</td>
<td>Snowy Hydro</td>
<td>Lot 3 DP874113</td>
<td>RU1</td>
</tr>
<tr>
<td>B</td>
<td>Cut 2</td>
<td>1,632m²</td>
<td>Required Acquisition</td>
<td>Snowy Hydro</td>
<td>Lot 3 DP874113</td>
<td>RU1</td>
</tr>
<tr>
<td>C</td>
<td>Widows creek</td>
<td>1,346m²</td>
<td>Required Acquisition</td>
<td></td>
<td>Lot 16 DP1035379</td>
<td>RU1</td>
</tr>
<tr>
<td>D</td>
<td>Leesville stockpile site</td>
<td>6,500m²</td>
<td>Potential lease</td>
<td>Snowy Monaro Shire Council</td>
<td>Lot 16 DP1160315</td>
<td>IN1</td>
</tr>
</tbody>
</table>
Map 3-1: The location of the proposal
4 Statutory and planning framework

4.1 State Environmental Planning Policies

4.1.1 State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State.

Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposal is for a road and road infrastructure facilities and is to be carried out by Roads and Maritime Services, it can be assessed under Part 5 of the Environmental Planning and Assessment Act 1979. 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 State Environmental Planning Policy No. 14 - Coastal Wetlands, State Environmental Planning Policy No. 26 - Littoral Rainforests, State Environmental Planning Policy (State and Regional Development) 2011 or State Environmental Planning Policy (Major Development) 2005.

Part 2 of the ISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation, including consultation as required by ISEPP (where applicable), is discussed in chapter 5 of this REF.

4.2 Local Environmental Plans

4.2.1 Snowy River Local Environmental Plan 2013

While the Snowy River Shire Council no longer exists and has been incorporated into the Snowy Monaro Regional Council along with Snowy River and Monaro Shire Councils, the relevant planning instrument currently remains the Snowy River Local Environmental Plan 2013 (LEP). Under the LEP the proposal would be carried out on land zoned R1 General Residential and RU1 Primary Production. Within zone R1 and zone RU1 road work is permitted with consent. However Clause 94 of the ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

The proposal would also be carried out on land that is mapped as a Terrestrial Biodiversity area on the Terrestrial Biodiversity Map (Sheet BIO_003). Additionally the western end of the proposal is mapped as Scenic Protection Areas Lake Eucumbene and Lake Jindabyne, also Eastern Approaches to Kosciuszko National Park on the Scenic Protection Area Map (Sheet SCP_003). Widow Creek at the western end of the proposal is mapped as a Watercourse in the Riparian Lands and Watercourses Map (Sheet WCL_003). The location of these areas is shown in Map 4-1 to Map 4-3 below. There are no other restrictions associated with this planning instrument.

These matters are addressed in this REF and the BA provided in Appendix 3.
Figure 4-1: Terrestrial Biodiversity features (green) within the study area (Snowy River LEP 2013)

Figure 4-2: Location of land mapped as Scenic Protection Areas within the vicinity of the proposal (Snowy River LEP 2013). This is pink and blue. Blue is a SPA relating to the eastern approaches to Kosciuszko NP
Figure 4-3: Location of land mapped as Watercourses (blue) and Wetlands (green) within the vicinity of the proposal (Snowy River LEP 2013)
4.3 Other relevant legislation

4.3.1 Environmental Planning and Assessment Act (EP&A Act)
The Environmental Planning and Assessment Act 1979 (EP&A Act) provides the framework for the assessment of Roads and Maritime activities. Roads and Maritime proposals are assessed and approved or determined under the following regimes:

1. **Part 5** applies to the majority of Roads and Maritime road projects. Usually a review of environmental factors (REF) is prepared to assess the environmental impact of a project prior to commencing the work.
2. **Part 5.1** applies to State significant infrastructure. These major projects require approval from the Minister for Planning. An environmental impact statement is prepared in accordance with the requirements of the Director-General of the Department of Planning and Environment.
3. **Part 4** applies to projects that require development consent from a consent authority (usually a local council). A statement of environmental effects or environmental impact statement (for designated development) is prepared to assess environmental impact.
4. **Division 4.1 of Part 4** applies to State significant development. These major projects require approval from the Minister for Planning and Infrastructure. An environmental impact statement is prepared in accordance with the requirements of the Director-General of the Department of Planning and Environment.

Clause 5A and 5C of the EP&A Act requires that the significance of the impact of the proposal on terrestrial and aquatic threatened species, populations and endangered ecological communities is assessed as follows:

1. **Part 5.1** – the proponent must demonstrate the proposal will improve or maintain biodiversity outcomes. Threatened species assessment guidelines have been developed to assist in making this assessment. Assessment of biodiversity issues is to be in accordance with the requirements of the Director-General of the Department of Planning and Environment.
2. **Part 5** (and Part 4 where relevant) – a Seven-part Test is prepared in accordance with Clause 5A(2).

4.3.2 Threatened Species Conservation Act 1995 (TSC Act)
The objectives of the TSC Act are as follows:

- To conserve biological diversity and promote ESD
- To prevent the extinction and promote the recovery of threatened species, populations and ecological communities
- To protect the critical habitat of those threatened species, populations and ecological communities that are endangered
- To eliminate or manage certain processes that threatens the survival or evolutionary development of threatened species, populations and ecological communities
- To ensure that the impact of any action affecting threatened species, populations and ecological communities is properly assessed
- To encourage the conservation of threatened species, populations and ecological communities by the adoption of measures involving co-operative management.

The threatened species assessment process under section 5A of the EP&A Act includes an Assessment of Significance (also known as the Seven-part test). These factors must be considered by decision makers regarding the effect of a proposed development or activity on threatened species, populations or ecological communities, or their habitats.
An assessment of the potential impacts of the proposal on threatened species, populations, ecological communities and critical habitat listed on the TSC Act was carried out in accordance with section 5A of the EP&A Act. A Seven-part test was conducted to characterise the significance of any potential impacts within the BA. That report is provided in Appendix 3 and concluded that there would be no significant impact on threatened species, populations or ecological communities, or their habitats.

4.3.3 Fisheries Management Act 1994 (FM Act)
The FM Act aims to conserve fish stocks, key habitats, threatened species, populations and ecological communities of fish and marine vegetation. It also aims to promote viable commercial fishing, aquaculture industries and recreational fishing.

The provisions of the Fisheries Management Act 1994 relating to the development approval process operate similarly to the TSC Act. The Act identifies threatened aquatic species, populations and ecological communities and requires an identical test of significance.

Significant impacts trigger the need for a species impact statement for Part 4 and Part 5 projects.

Activities that trigger the requirement for Roads and Maritime services to notify the Minister for Fisheries as follows:
- Dredging or reclamation of waterways, including removal of snags (28 days notification) (sections 198 and 199)
- Construct, alter or modify a dam, weir or reservoir on a waterway (section 218).

A permit from the Minister for Fisheries is required to:
- Harm to marine vegetation, including mangroves, seagrasses and any other marine vegetation declared in the regulations to be vegetation to which the act applies (section 205).

The proposal will result in the replacement of a culvert in an unnamed creek. Notification to DPI Fisheries within 28 days of the proposed work commencing is required.

An evaluation for the potential for biota listed under the FM Act to occur or to be impacted by the proposal is included within the BA provided in Appendix 3.

4.3.4 National Parks and Wildlife Act 1974 (NP&W Act)
The objectives of this Act are the conservation of nature, objects, places or features of cultural value within the landscape, fostering public appreciation understanding and enjoyment of nature and cultural heritage and their conservation and providing for the management of land reserved under this Act in accordance with the management principles applicable for each type of reservation. Further, the objects are to be achieved by applying the principles of ESD.

This proposal would not impact on any land, objects, places or features of cultural value (Aboriginal and non-Aboriginal) reserved under this Act. A Due Diligence Assessment completed by NSW Archaeology found that the proposal area has no aboriginal sensitivity and no objects were located during the field survey. Nonetheless, this REF applies the principles of ESD.

4.3.5 Protection of the Environment Operations Act 1997
The Protection of the Environment Operations Act 1997 (POEO Act) provides an integrated system of licensing for certain activities within the objective of protecting the environment.

Schedule 1 of the POEO Act describes activities for which an Environment Protection Licence (EPL) is required.Clauses of Schedule 1 which have relevance to the proposal are outlined in below.
<table>
<thead>
<tr>
<th>Clause</th>
<th>Response</th>
<th>Potential Licensee</th>
</tr>
</thead>
</table>
| **Clause 19 Extractive activities**  
An EPL is required for any land based extractive activity that involves the extraction, processing or storage of more than 30,000 tonnes per year of extractive materials. | The proposal would potentially result in earthworks exceeding 30,000 tonnes. An EPL is therefore required. | Roads and Maritime |
| **Clause 35 Road construction**  
This clause applies to road construction, meaning the construction, widening or rerouting of roads, but does not apply to the maintenance or operation of any such road. The activity to which this clause applies is declared to be a scheduled activity if it results in the existence of 4 or more traffic lanes. | The proposal will not result in the existence of 4 or more traffic lanes. Therefore, the proposal is not a scheduled activity under the meaning of Clause 35. | Nil |
| **Clause 42 Waste storage**  
This clause applies when more than 2,500t or 2,500m³ of solid waste is stored or when more than 12,000t if received at a premises. | Roads and Maritime is exempt from the scheduled activities described in this clause under the Roads and Maritime Services stockpile exemption 2015. This exemption does not extend to Council. | SMRC |

The contractor and Roads and Maritime are obliged to notify the Environment Protection Authority (EPA) when a ‘pollution incident’ occurs that causes or threatens ‘material harm’ to the environment.

### 4.4 Commonwealth legislation

#### 4.4.1 Environment Protection and Biodiversity Conservation Act 1999

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land.

In September 2015, a “strategic assessment” approval was granted by the Federal Minister in accordance with the EPBC Act which applies to Roads and maritime activities being assessed under Part 5 of the EP&A Act.

The implications of the approval and the associated assessment processes are detailed in the *Roads and Maritime Environmental Impact Assessment Practice Note – Environment Protection and Biodiversity Conservation Act 1999 – Strategic Assessment (EIA-N07)*. The practical effect of the approval is that Roads and Maritime projects assessed under Part 5 of the EP&A Act:

- Must address and consider potential impacts on nationally listed threatened species, populations, ecological communities and migratory species, including application of the “avoid, minimise, mitigate and offset” hierarchy.
• Do not require referral to the Federal Department of the Environment for these matters, even if the activity is likely to have a significant impact.

These are considered in the Biodiversity Assessment (BA) in Appendix 3 and Chapter 6 of the REF.

The assessment of the proposal’s impact on matters of national environmental significance and the environment of Commonwealth land found that there is unlikely to be a significant impact on relevant matters of national environmental significance. Accordingly, the proposal has not been referred to the Australian Government Department of the Environment.

4.5 Confirmation of statutory position

The Roads and Maritime is the determining authority for the proposal as defined by the Environmental Planning and Assessment Act 1979. Under Section 111 of the EP&A Act, Roads and Maritime is obligated to undertake an environmental assessment as the proponent for the proposed work; this REF fulfils that obligation. The proposed work would be undertaken under part 5 of the EP&A Act.
5 Stakeholder and community consultation

All necessary community and stakeholder consultation would be carried out by Roads and Maritime in accordance with the Roads and Maritime Community Involvement Practice Notes and Resource Manual.

5.1 Community involvement

Community consultation that would be carried out as part of this proposal includes the following activities:

- Notification of landowners to be affected by the proposal such as the sensitive receivers adjacent to the proposal
- Notifications would be placed in local print media prior to the commencement of work detailing the likely timing of the proposal, potential changes to traffic conditions and project management contact details to open communication channels to provide further details or address complaints
- Temporary electronic Variable Message Signs (VMS) placed at both the northern and southern ends of the proposal to advise of the project and potential delays to motorists
- Meetings and briefings with stakeholders, businesses and residences (as required)
- Letters, phone calls, emails and target correspondence

5.2 Aboriginal community involvement

Aboriginal community involvement and heritage impact was considered in accordance with the Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation (Resource 7) (PACHCI) (Appendix 4). The site was assessed by the Roads and Maritime Cultural Heritage Officer, the Bega Local Aboriginal Land Council and an Archaeologist. According to the Roads and Maritime PACHCI, the proposal was assessed as being unlikely to have impact on Aboriginal Cultural Heritage. Aboriginal Heritage and the PACHCI process is considered further in section 6.6.

5.3 ISEPP consultation

As council consent would not be required for this proposal, Roads and Maritime needs to take into account the items listed in Clauses 13 to 16 of the SEPP (Infrastructure). These clauses relate to consultation requirements for work which may be carried out without consent but which trigger the items listed in the following table. If any of these items are triggered, the public authority, or persons representing the public authority would not be able to carry out the work. Once the items in the following table are triggered, the public authority must give written advice to the council of the intention to carry out the development and also take into consideration any response to the notice received from the council. Table 5-1 outlines items in clause 13 to 16 of the ISEPP and the potential impact.

Table 5-1: ISEPP clause 13 to 16 assessment

<table>
<thead>
<tr>
<th>Item</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clause 13: 1(a): Substantial impact on stormwater management services provided by a council</td>
<td>The proposed work would not have a significant impact on the stormwater system.</td>
</tr>
<tr>
<td>Clause 13: 1(b): Likely to generate traffic to an extent that will strain the capacity of the road system in a local government area</td>
<td>The work is unlikely to generate traffic that would strain the capacity of the road system. Some traffic delays would be experienced however this would only be during...</td>
</tr>
<tr>
<td>Item</td>
<td>Impact</td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Clause 13: 1(c): Involves connection to, and a substantial impact on the capacity of, any part of a sewerage system owned by a council</td>
<td>This proposal does not involve connection to or alteration of the sewerage system.</td>
</tr>
<tr>
<td>Clause 13: 1(d): Involves connection to, and use of a substantial volume of water from, any part of a water supply system owned by a council</td>
<td>The proposal does not involve connection to, and use of a substantial volume of water from, any part of a water supply system owned by a council. If water is to be drawn from the council system, approval would be sought.</td>
</tr>
<tr>
<td>Clause 13: 1(e): Involves the installation of a temporary structure on, or the enclosing of, a public place that is under a council’s management or control that is likely to cause a disruption to pedestrian or vehicular traffic that is not minor or inconsequential</td>
<td>This proposal does not involve the installation of a temporary structure on, or enclose a public place, or disrupt pedestrian or vehicular traffic in a place that is under council management.</td>
</tr>
<tr>
<td>Clause 13: 1(f): Involves excavation that is not minor or inconsequential of the surface of, or a footpath adjacent to, a road for which a council is the roads authority under the Roads Act 1993 (if the public authority that is carrying out the development, or on whose behalf it is being carried out, is not responsible for the maintenance of the road or footpath)</td>
<td>This proposal does not involve the excavation of the footpath adjacent to a road for which the council is the roads authority.</td>
</tr>
<tr>
<td>Clause 14: Development that is likely to have an impact that is not minor or inconsequential on a local heritage item (other than a local heritage item that is also a State heritage item) or a heritage conservation area</td>
<td>The proposal is unlikely to have an impact on any local heritage item that is not minor or inconsequential. There are two heritage items in close proximity to the proposal however the proposal would not directly impact on these items (see Section 6.7).</td>
</tr>
<tr>
<td>Clause 15: Development on flood liable land.</td>
<td>The proposal would not be developed on flood liable land.</td>
</tr>
<tr>
<td>Clause 16 (a-e): Development adjacent to land reserved under the National Parks and Wildlife Act 1974, Marine Parks Act 1997, Fisheries Management Act 1994 or the Sydney Harbour Foreshore Authority Act 1998, Maritime Authority of NSW (Fixed or floating structure in or over navigable waters) or the NSW Rural Fire Service (bushfire prone land as mapped by the council).</td>
<td>This proposal would not be carried out on land adjacent to land reserved under the National Parks and Wildlife Act 1974, Marine Parks Act 1997, Fisheries Management Act 1994 or the Sydney Harbour Foreshore Authority Act 1998. The proposal would not involve a fixed or floating structure in or over navigable waters or land mapped as bushfire prone land.</td>
</tr>
<tr>
<td>Clause 16 (f): development for the purposes of an educational establishment, health services facility, correctional centre or group home, or for residential purposes, in an area that is bush fire prone land (as defined by the Act)-the NSW Rural Fire Service</td>
<td>The proposal is not for this type of development.</td>
</tr>
<tr>
<td>Clause 16 (g): development that may increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map-the Director of the Observatory</td>
<td>The proposal is not located within 200 kilometres of the Spring Hill Observatory</td>
</tr>
<tr>
<td>Clause 16 (h): development on defence communications facility buffer land within the meaning of clause 5.15 of the Standard Instrument-the Secretary of the</td>
<td>The proposal is not located on land near a defence communications facility</td>
</tr>
</tbody>
</table>
As none of the items listed in Table 1 would be triggered by this proposal under ISEPP, consultation with Snowy Monaro Regional Council would not be required.

5.4 Government agency and stakeholder involvement

5.4.1 Snowy Monaro Regional Council (formerly Snowy River and Monaro Shire Councils)

Consideration of the items listed in Clause 13-16 of the Infrastructure SEPP determines whether or not statutory consultation with council is required. No statutory consultation is required.

5.4.2 General Consultation

Roads and Maritime have undertaken general consultation with various stakeholders with regard to the proposal, these being:

- Snowy Mountains Grammar School
- Essential Energy
- Snowy Hydro
- Snowy Monaro Regional Council
- National Parks and Wildlife Service during regional planning meetings.

5.4.3 NSW Office of Environment and Heritage

Clause 16 of ISEPP outlines a requirement to consult with the NSW Office of Environment and Heritage (OEH) where work is adjacent to land gazetted under the National Parks and Wildlife Act 1974. The proposal is not located adjacent to land reserved under that Act and statutory consultation with OEH is not required. Nonetheless, Roads and Maritime have discussed the proposal with OEH during regional planning meetings given that access to Kosciuszko National Park snow fields is by this section of Kosciuszko Road.

5.5 Ongoing or future consultation

This review of environmental factors will be placed on public display to provide the community with the opportunity to comment. Information days will also be held during the display period. Details of these information dates and locations will be advertised before the events and issued in a Roads and Maritime Community Update and through the local media.

After public display of the review of environmental factors, submissions will be collated and a submissions report prepared which addresses any issues raised by stakeholders. The submissions report will be made available to the public via the Roads and Maritime website. The community will be informed of any major design changes required to address community concerns.

In addition, notification for residents and motorists would be implemented prior to and during construction using VMS. Consultation with those residents whose access may be affected by the work, or may be affected by construction noise would be carried out by Roads and Maritime. The work would also be added to the Roads and Maritime Live Traffic Website as ‘scheduled road work’ to provide advance notice to motorists to inform them of the potential for delays and to allow for travel time adjustment where possible. Further consultation actions will be developed as part of the project communication plan.
Environmental assessment

This section of the REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. All aspects of the environment potentially impacted upon by the proposal are considered. This includes consideration of the factors specified in the guidelines Is an EIS required? (DUAP 1999) and Roads and Related Facilities (DUAP 1996) as required under clause 228(1)(b) of the Environmental Planning and Assessment Regulation 2000. The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are also considered in Appendix 2. Site-specific safeguards are provided to ameliorate the identified potential impacts.

6.1 Biodiversity

6.1.1 Database searches

A complete Biodiversity Assessment (BA) (Appendix 3) was undertaken and included a series of database searches to identify the diversity of flora and fauna potentially occurring in the study area. The database searches conducted are included in Table 6-1.

Table 6-1: Database searches carried out for the Biodiversity Assessment

<table>
<thead>
<tr>
<th>Database</th>
<th>Search For</th>
<th>Search Area</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>OEH Wildlife Atlas Data (Bionet)</td>
<td>Threatened flora, fauna and populations</td>
<td>10 kilometre radius</td>
<td>08/02/2017</td>
</tr>
<tr>
<td>NSW Department of Primary Industries (DPI) Fisheries Fish Records Viewer:</td>
<td>Threatened Fish species</td>
<td>10 kilometre radius</td>
<td>08/02/2017</td>
</tr>
<tr>
<td>OEH Threatened species profile search</td>
<td>Threatened flora, fauna and populations</td>
<td>Monaro (Part C)</td>
<td>08/02/2017</td>
</tr>
<tr>
<td>EPBC Act Protected Matters Search</td>
<td>Threatened flora and fauna, endangered populations, ecological communities and migratory species</td>
<td>10 kilometre radius</td>
<td>08/02/2017</td>
</tr>
<tr>
<td>OEH Critical Habitat Register</td>
<td>Critical habitat</td>
<td>10 kilometre radius</td>
<td>20/02/2017</td>
</tr>
<tr>
<td>OEH vegetation information system (VIS)</td>
<td>Vegetation communities and descriptions</td>
<td>Study area</td>
<td>20/02/2017</td>
</tr>
<tr>
<td>OEH Vegetation Types Database</td>
<td>Vegetation communities</td>
<td>Study area</td>
<td>20/02/2017</td>
</tr>
<tr>
<td>BOMs Atlas of Groundwater Dependent Ecosystems (GDE)</td>
<td>Groundwater dependent ecosystems</td>
<td>10 kilometre radius</td>
<td>20/02/2017</td>
</tr>
<tr>
<td>Department of Environment’s directory of important wetlands</td>
<td>Important wetlands</td>
<td>10 kilometre radius</td>
<td>20/02/2017</td>
</tr>
<tr>
<td>DPI Noxious weeds database</td>
<td>Declared noxious weeds</td>
<td>Snowy Monaro Regional LGA</td>
<td>13/02/2017</td>
</tr>
<tr>
<td>Department of Planning’s SEPP 14 wetlands spatial data</td>
<td>SEPP14 wetlands</td>
<td>10 kilometre radius</td>
<td>20/02/2017</td>
</tr>
<tr>
<td>DPI’s database for aquatic TECs</td>
<td>Aquatic TECs</td>
<td>10 kilometre radius</td>
<td>20/02/2017</td>
</tr>
<tr>
<td>Atlas of Living Australia</td>
<td>All fauna and flora species</td>
<td>Study area</td>
<td>20/02/2017</td>
</tr>
</tbody>
</table>

Additionally, a literature review for any relevant local information was conducted on 22 November 2016 using the following key words: Kosciuszko Road, Snowy River, Snowy Monaro, Biodiversity, management plan. These searches revealed the following documents:

- Snowy River Local Environment Plan 2013
These documents, along with the Monaro Highway and Kosciuszko Road Overtaking Lanes Preliminary Environmental Investigation (Envirokey 2016) were considered where appropriate.

The area of investigation adopted for the BA is detailed in Appendix 3.

An assessment was conducted for the study area to identify biodiversity values and included targeted surveys for threatened species, populations and ecological communities.

One native vegetation community was recorded within the study area:

- Snow Gum - Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion (PCT 1191)

In addition, planted vegetation (native and exotic) and introduced grasslands and trees were also recorded in the study area. The details of where native and non-native vegetation are found in relation to the proposal are included in Map 6-1.

The condition of the vegetation varied, with the overstorey vegetation generally in moderate to good condition, whilst the understorey was found to be in low condition with a predominance of exotic species.

The native vegetation type present qualifies as Snow Gum Grassy Woodland, an endangered ecological community listed on the NSW Threatened Species Conservation Act 1995. However, this threatened ecological community (TEC) is not listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

No threatened plant species were recorded and given the highly disturbed nature of the vegetation, none are considered likely to occur. Several weeds were identified including Patersons Curse, African Lovegrass, Willow sp. St. Johns Wort, White Horehound and Sweet Briar which are listed as noxious weeds in the SMRC LGA.

Two threatened fauna species, the Dusky Woodswallow, and Diamond Firetail were recorded during the field surveys however they were recorded outside the proposal area. Potentially suitable habitat is present for a number of other threatened species in the form of the existing woodland. However, this is highly compromised in quality given its proximity to the road and that larger, higher quality woodland remnants occur in the general locality. It is unlikely that migratory species listed on the EPBC Act could occur. Culverts were inspected for microbats with no roosting bats observed.

The aquatic habitat within the study area was considered to be low quality, existing in a minor creek (Widows Creek) which was mostly dominated by introduced species. At the time of the survey there was water flowing in the creek however there were no large pools that would support a population of fish therefore no detailed aquatic fauna surveys were undertaken. No threatened aquatic species, listed under the FM Act, were determined to have a moderate to high potential to occur.

The BA is provided in full in Appendix 3 of this REF.

6.1.2 Potential impacts

The direct and indirect impact of the proposal includes:

- Removal of 0.41 hectares of native vegetation, all of which constitutes Snow Gum Grassy Woodland
- Removal of 2.88 hectares of non-native vegetation
- Injury and mortality of fauna
• Invasion and spread of weeds

With a number of noxious and environmental weeds identified within the vicinity of the proposal, the potential to spread these across the site particularly during earthworks is relatively high. Noxious weeds, including the potential spread of willow, should be included in any CEMP should the proposal proceed.

No impacts are likely at the Leesville stockpile site as this is an existing stockpile site that is highly disturbed and operated by Snowy Monaro Regional Council.

Assessments of significance were conducted for threatened species and the ecological community likely to be impacted by the proposal. These concluded that the proposal is unlikely to have a significant impact on any threatened biota. A Species Impact Statement or Referral to the Commonwealth is not required.

A number of mitigation measures have been recommended to minimise and mitigate impact from the proposal.
Map 6-1: Vegetation and noxious weeds within the vicinity of the proposal.
6.1.3 Safeguards and management measures

Roads and Maritime has developed *Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA projects* (RTA 2011) which are intended for Roads and Maritime Project Managers, Staff and Contractors to help minimise impact on biodiversity during construction projects such as the proposal.

Mitigation measures have been recommended to minimise and mitigate impact from the proposal on biodiversity and are included in Table 6-2.

Table 6-2: Biodiversity safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of native vegetation</td>
<td>• Exclusion zones must be established around any areas of TEC that are outside the limit of clearing.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>• Should disturbed soil within the proposal footprint (such as cuttings) be exposed for lengthy periods, these will be stabilised using an appropriate seeding mix to minimise potential erosion impacts.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removal of threatened species habitat and habitat features</td>
<td>• Habitat removal must be carried out in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011).</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>Removal of threatened plants</td>
<td>• The unexpected species find procedure is to be followed under <em>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</em> (RTA 2011) if threatened flora species, not assessed in the biodiversity assessment, are identified in the proposal site.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>Injury and mortality of fauna</td>
<td>• Fauna will be managed in accordance with <em>Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</em> (RTA 2011).</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>Invasion and spread of weeds</td>
<td>• Noxious weeds present within the proposal footprint will be managed in accordance with <em>Guide 6: Weed management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</em> (RTA 2011)</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
</tbody>
</table>
6.2 Soils and Water

6.2.1 Existing Environment

According to the Mitchell Landscapes dataset (Mitchell 2002), the proposal is entirely within one Mitchell Landscape system, Jindabyne Plains (Map 6-2). The proposal is located within the NSW South Eastern Highlands Bioregion. The Mitchell landscape system is described as follows:

- Jindabyne Plains (Jbv) - This landscape consists of wide open valleys and plains at a general elevation of 800 to 900m with surrounding low ranges and rounded peaks to 1100 metres on massive Silurian-Devonian granite and granodiorite. Shallow gravelly loams on slopes, extensive red and yellow texture-contrast soils on slopes, two or three terraces marginal to the main streams with dark coloured gritty uniform loams and clays in alluvium. Dry tussock grassland of rough and variable spear grasses (*Austrostipa variabilis*) with Kangaroo Grass (*Themeda triandra*) on valley floors, patches of open Snow Gum (*Eucalyptus pauciflora*) and Black Sallee (*Eucalyptus stellulata*) woodland on hills, open forest of Yellow Box (*Eucalyptus melliodora*), Blakely’s Red Gum (*Eucalyptus blakelyi*), with mixed understorey on moister ranges merging with adjacent landscapes.

Soils are generally moderately erodible in these landscapes and the potential for soil erosion and sedimentation have been considered in this REF.

The major water features in the area is Lake Jindabyne (Map 6-3) and an intermittent drainage line called Widows Creek at the western end of the proposal. Lake Jindabyne has the primary purpose of being an integral part of the Snowy Mountains Hydro Electricity Scheme. It is a large body of water that has a high level of recreational use including boating and fishing and its water is used for a potable supply for Jindabyne and other local towns.

Widows Creek flows into Lake Jindabyne, beneath Kosciuszko Road via an existing four cell culvert (Figure 6-1). This would require extension as part of the proposal and rehabilitation through the use of a concrete liner. At the time of the field survey there was a significant amount of water flowing through the culvert however there had also been high rainfall recorded in the region and it is unlikely that there would be this amount of water year round.
A minor waterway is located adjacent to the existing Leesville stockpile site, Lees Creek. At the time of the field survey was dry, confirming it is ephemeral.

6.2.2 Potential impact

The proposal would require the removal of vegetation, excavation and the deposition of fill and the resulting soil disturbance would expose these areas to erosion, runoff and sedimentation hazards during rainfall events.

Further impact could result from strong winds blowing over exposed soils causing dust disturbances. Any excess material from the proposal would be provided to Snowy Monaro Regional Council who would stockpile the material at the existing Leesville stockpile site for use in future council projects.

Machinery could become potential sources of contamination. Leakage or spillage of fuels from construction machinery could result in soil contamination which is most likely to occur where construction machinery is repeatedly used or parked periodically while not in use. The proposed site compound would be located more than 200 metres from Lake Jindabyne in accordance with the Roads and Maritime Stockpile Site Management Guideline, 2015. Any chemical or fuel spills in this area could potentially cause contamination of Lake Jindabyne.

Extending and relining the existing culvert at Widows Creek would require the use of a small excavator. Water would be diverted through one or more culverts while work would be carried out in a single culvert. This approach would provide a dry working area with no clean offsite water able to mix with site water. Once the first culverts are lined, the clean water diversion would be
transferred to the newly lined culverts and the final culvert relined. The culvert apron would be concreted to prevent further scour with rock placed into the culvert outlet to repair the scour and prevent further scour. Other minor scour protection and vegetation removal work would be undertaken adjacent to the culvert inlet and outlet.

Impacts to soil and water at the existing Leesville stockpile site would be minimised as the site is highly disturbed and well bunded.
Map 6-2: Mitchell landscapes within the vicinity of the proposal
Map 6-3: Location of the major water features in the vicinity of the proposal
6.2.3 Safeguards and management measures

The recommended safeguards and management measures to minimise the potential impact on soils and water are found in Table 6-3.

Table 6-3: Soil and water safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erosion and sedimentation</td>
<td>• Erosion and sediment control measures must be implemented and maintained to:</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>- Prevent sediment moving off-site and sediment laden water entering any water course,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>drainage lines, or drain inlets.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Reduce water velocity and capture sediment on site.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Minimise the amount of material transported from site to surrounding pavement surfaces.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Divert clean water around the site.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book 1 &amp;2))</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Erosion and sediment control measures are not to be removed until the work is complete and areas are stabilised</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Work areas will be stabilised progressively during the work</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The maintenance of established stockpile sites during work must be in accordance with the Roads and Maritime Stockpile Site Management Guideline, 2015.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Quality</td>
<td>• There must be no release of dirty water into drainage lines and/or waterways</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>• Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/slicks) must be carried out on a regular basis to identify any potential spills or deficient erosion and sediment controls</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Water quality control measures must be used to prevent any materials (e.g. concrete, grout, sediment etc.) entering drain inlets or waterways</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Impact

<table>
<thead>
<tr>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• An Environmental Work Method Statement must be prepared for culvert extension and relining activities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contractor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td></td>
</tr>
<tr>
<td>Chemical runoff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fuels, chemical and liquids must be stored in an impervious bunded area a minimum of 50 metres away from:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Rivers, creeks, or any areas of concentrated water flow.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Flooded or poorly drained areas.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Slopes above 10%.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cleaning of spray bars (or equivalent equipment) is to occur in suitable areas (e.g. not table drains) and not cause water pollution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Refuelling of plant and equipment must occur in impervious bunded areas located a minimum of 50 metres away for drainage lines of waterways unless within a bunded stockpile site</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Vehicle wash down and/or cement truck washout must occur in a designated bunded area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Moveable plant such as pumps and generators must be bunded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• An Emergency spill kit must be kept onsite at all times. All staff must be made aware of the location of the spill kit and trained in its use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• If an incident (e.g. spill) occurs, the Roads and Maritime Environmental Incident Classification and Management Procedure would be followed and the Roads and Maritime Services Contract Manager notified as soon as practicable.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 6.3 Waste and Resource Management

#### 6.3.1 Policy setting

Roads and Maritime Services are committed to ensuring responsible management of unavoidable waste and to promoting the reuse of such waste through appropriate measures. This is done in accordance with the resource management hierarchy principles contained in the *Waste Avoidance and Resource Recovery Act 2001*. The resource management hierarchy principles in order of priority as outlined in the *Waste Avoidance and Resource Recovery Act 2001* are:

- Avoidance of unnecessary resource consumption
- Resource recovery (including reuse, reprocessing, recycling and energy recovery)
- Disposal.

By adopting the above principles, Roads and Maritime encourages the most efficient use of resources and reduces cost and environmental harm in accordance with the principles of ESD.
6.3.2 Potential impact

The proposed work is expected to result in large quantities of excess spoil (around 10,953 m³). Earthworks would consist primarily of cutting with very little fill. A MOU has been established with Snowy Monaro Regional Council whereby this excess material would be transported to Council’s Leesville stockpile site, where it would be processed and stored for re-use in future projects in accordance with relevant waste legislation.

The proposal would also generate additional waste, some of which would be able to be recycled or reused including:

- Excess or unsuitable excavated materials
- Millings from removal and replacement of pavement
- Paper and office waste from project management activities
- Waste from staff and construction personnel (food, packaging)
- Excess concrete, geotextile fabric and other building materials
- Minor amounts of vegetation including noxious environmental weeds.

The proposed work would result in the use of a number of resources, including but not limited to:

- Asphalt
- Concrete
- Steel
- Select fill
- Water
- Resources associated with the operation of construction machinery, and motor vehicles.

The majority of resources to be used are non-renewable and have the potential to contribute to climate and air quality impact.

6.3.3 Safeguards and management measures

The recommended safeguards and management measures to minimise the potential impact of waste are found in Table 6-4.

Table 6-4: Waste minimisation safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
</table>
| Waste minimisation and management | - Resource management hierarchy principles must 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 carried out as a last resort (in accordance with the Waste Avoidance & Resource Recovery Act 2001).  
  - A Section 143 form must be completed for project waste (eg. fill) sent to a site not owned by the Roads and Maritime Services (excluding Office and Environment and Heritage licensed landfills) for land disposal in accordance with the Roads and | Contractor       | Construction    |
### 6.4 Traffic and Access

#### 6.4.1 Existing environment

Kosciuszko Road between Barry Way and Alpine Way consists of a three lane two way road, with two lanes in the east bound direction and one lane in the westbound direction. Traffic volumes vary between summer and winter with high volumes throughout the winter snow season. Traffic volumes outside of the snow season are generally low. Traffic counts in November 2014 recorded an Average Daily Traffic volume of 2,200.

The stretch of road between Barry Way and Alpine Way contains one access on the eastbound side which provides to access the Lake Jindabyne Sailing Club and lake foreshore. The westbound side of the road contains one driveway access to an Essential Energy depot and a driveway access to Snowy Mountains Grammar School. A recreational shared track is located between the proposal and the shoreline of Lake Jindabyne (Figure 6-2).

The Leesville stockpile site is located off Barry Way, a local road that provides access to the Leesville industrial estate, Jindabyne Airport and several residential properties and accommodation providers.

#### 6.4.2 Potential impact

The proposal would not be constructed over winter. Works would commence October 2017 and cease at the commencement of the snow season in June 2018. Remaining works would occur between October 2018 and June 2019. Work would also occur on weekends. This approach would avoid major traffic impacts that could occur should construction continue through winter. Through the construction area, a reduced speed limit of 40km/h would apply, and some traffic control may be required at times. There may also be stop slow lane closures with delays of up to 5 minutes possible.

In order to safely carry out the proposal, one lane of Kosciuszko Road would be closed, reducing this section to a two lane, two way road. Where required, the road would also be reduced to one lane under stop slow traffic control. This would disrupt traffic flow, causing short delays. Short, temporary delays are also anticipated at the stockpile sites. All three lanes would be open throughout winter 2018.

Truck movements between Leesville, which is located within an industrial area, and the proposal would increase for the duration of the works with a large increase during the earthworks phase as material is hauled to and from the stockpile site for processing. Around 33 truck movements per
day between the proposal and the Leesville stockpile site are likely. This would result in the movement of about 800 tonnes of spoil per day over 37 days.

Should blasting of rock be required, some temporary closures of Kosciuszko Road and the shared trail are also likely. The shared trail would only be closed during blasting in accordance with a Blasting Management Plan.

A Road Occupancy Licence would be obtained for the work.

### 6.4.3 Safeguards and management measures
The recommended safeguards and management measures to minimise the potential impact on traffic are found in Table 6-2.

Table 6-2: Traffic safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic</td>
<td>• Consultation with stakeholders and the community will be carried out by Roads and Maritime&lt;br&gt;• Current traffic movements and property accesses must be maintained during the work, where possible&lt;br&gt;• A traffic management plan must be prepared prior to work commencing and must accommodate the needs of planned community events.&lt;br&gt;• Activities that would impact traffic must be not be undertaken throughout the peak winter period.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
</tbody>
</table>

### 6.5 Noise and Vibration

#### 6.5.1 Background
There are numerous potential sensitive receivers located in close proximity to the proposal, consisting of private residences and a school at the eastern end of the proposal and other commercial holdings such as the Lake Jindabyne Yacht Club and the Essential Energy Jindabyne Depot. The Lake Jindabyne shared trail runs the length of the proposal and the area is popular for active and passive recreation (Figure 6-2). The closest sensitive receiver is a building that is part of the Snowy Mountains Grammar School which is about 30 metres from the road fog line. Generally, the existing environment near the proposal is mostly influenced by road traffic and bird and animal noise with the established background noise level reflective of the relatively quiet surrounds typical of a semi-urban and rural setting. Kosciuszko Road in this location generally has a low level of traffic consisting of light and heavy vehicles. During winter, and over busy weekends at other times of the year, traffic levels increase significantly.

Rating background noise levels (RBL (LA90 (15 minute))) during the day were recorded at one location next to Kosciuszko Road, at a distance of about five metres from the road edge (Figure 6-2). It is expected that the noise levels experienced at the sensitive receivers would be lower than this, given that they are a further distance from the existing road pavement.

Background noise levels near the proposal are considered to be moderate with consideration of the proximity to the road. Table 6-3 below summarises the noise levels recorded during the noise survey. The RBL (LA90 (15min)) was 48.5. This confirms that the site is most similar to the representative noise environment of R2 as detailed within the Roads and Maritime Construction
Noise Estimator. This has an RBL (LA90) of 45 (Day), 40 (Evening) and 35 (Night) respectively. For the purpose of this assessment, R2 as the representative noise environment has been used.

### Table 6-3: Noise survey summary

<table>
<thead>
<tr>
<th>Date</th>
<th>Time Started</th>
<th>Time Finished</th>
<th>Lowest Background Reading (dB)</th>
<th>Highest Reading (dB)</th>
<th>RBL (LA90 (15min))</th>
</tr>
</thead>
<tbody>
<tr>
<td>15/02/2017</td>
<td>10:30</td>
<td>10:45</td>
<td>30.0</td>
<td>92.1</td>
<td>48.5</td>
</tr>
</tbody>
</table>

#### 6.5.2 Potential impact

Work associated with the proposal would be carried out within a combination of commercial and rural settings. Construction activities would likely result in a temporary increase in noise levels for sensitive receivers located in close proximity due to the operation of plant and machinery. The *Interim Construction Noise Guidelines* (2009) sets out management levels for construction noise while the NSW EPA *Road Noise Policy* (2011) guided the road traffic noise assessment. The following management levels are applicable for residential properties:

- Day noise management level (LAeq, RBL + 10dBA).
- Day out of hours work noise management level (LAeq, RBL + 5dBA).
- Evening noise management level (LAeq, RBL + 5dBA).
- Night noise management level (LAeq, RBL + 5dBA).

The recorded daytime RBL, and adopted representative noise environment for other periods was used to calculate the construction noise management levels for residential receivers. The *Interim Construction Noise Guidelines* (2009) also sets out noise management levels for non-residential receivers that are independent of the RBL which are also included in Table 6-4.

### Table 6-4: Relevant sensitive receiver noise management levels

<table>
<thead>
<tr>
<th>Noise Management Level (dB(A))</th>
<th>Residential receiver</th>
<th>Non-residential receivers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Classrooms (exterior)</td>
<td>Active recreation</td>
</tr>
<tr>
<td>Standard hours</td>
<td>59</td>
<td>55</td>
</tr>
<tr>
<td>Day out of hours work</td>
<td>54</td>
<td>55</td>
</tr>
<tr>
<td>Evening</td>
<td>45</td>
<td>N/A</td>
</tr>
<tr>
<td>Night</td>
<td>40</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Construction sound pressure levels for each activity were calculated using the Roads and Maritime Construction Noise Estimator, full results are shown in Appendix 4 and summarised in Table 6-5.

Earthworks would generally be undertaken by excavators and dozers. Harder rocks may need to be ripped, and in some cases blasted. This is likely to result in increased noise impacts, but with the exact nature of the blasting (if any) unknown, a noise management plan is the most appropriate management measure for any impacts from blasting.

The major potential sources of construction vibration includes vibrating rollers. Equipment and plant have the potential to operate at a minimum offset distance of 30 m from the nearest receiver.
when work occurs along the alignment. Generally, rolling would take place along the alignment prior to road construction, or when relocation of services has occurred. Peak levels of vibration from rolling typically occur as the roller stops to change direction and a resonance is created as the roller (and vibrator) is stationary. Impacts associated with vibration emissions are not anticipated for the proposal.

The existing Leesville stockpile site is located within an existing industrial area. Noise levels, while not specifically recorded, are expected to be greater within the industrial estate, than the surrounding area. The use of the existing stockpile site at Leesville is unlikely to increase the levels of current noise to a significant level. Truck movements between Leesville and the proposal would increase for the duration of the works with a large increase during the earthworks phase as material is hauled to and from the stockpile site for processing. Around 33 truck movements per day between the proposal and the Leesville stockpile site are likely. This would result in the movement of about 800 tonnes of spoil per day over 37 days. This impact equates to about 3 truck movements per hour. Given the nature of the existing industrial area, truck movements during the day are not likely to be a significant increase to existing vehicle movements.

Operational impacts are likely to be negligible given that the proposal does not aim to increase traffic movements.

6.5.3 Safeguards and management measures

The recommended safeguards and management measures to minimise the potential impact on noise and vibration are found in Table 6-5.

Table 6-5: Noise and vibration safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise and vibration</td>
<td>• Construction noise and vibration impacts will be managed in accordance with a Noise Management Plan prepared with consideration of the Roads and Maritime Construction Noise and Vibration Guideline</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
</tbody>
</table>
Figure 6-2: Location of noise logging and key sensitive receivers and the recreational shared track.
6.6 Aboriginal Heritage

6.6.1 Due diligence determination
A preliminary assessment was carried out by Roads and Maritime based on Stage 1 of the Procedure for Aboriginal cultural heritage consultation and investigation (PACHCI). The assessment was based on the following due diligence considerations:

- The likelihood that the proposal would harm known Aboriginal objects or places.
- An AHIMS search that indicated moderate to high concentrations of Aboriginal objects or places in the study area given the presence an artefact near Widows Creek.
- The presence of landscape features that would indicate the presence of Aboriginal objects, based on the Office of Environment and Heritage’s Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW and the Roads and Maritime procedure
- The cultural heritage potential of the study area.

Based on these factors, a Stage 2 assessment was undertaken.

NSW Archaeology undertook a Due Diligence Assessment in accordance with the Due Diligence Code which outlines a number of steps to be adhered to in order to exercise due diligence when activities are undertaken that have the potential to cause harm to Aboriginal objects. The code stipulates that these steps should be followed in order to:

- identify whether or not Aboriginal objects are or are likely to be present in an area
- ascertain whether or not the proposed activities are likely to harm Aboriginal objects (if present)
- determine whether an Aboriginal Heritage Impact Permit (AHIP) application is required.

If Aboriginal objects are present or likely to be present and an activity will harm those objects, an AHIP is required.

A field inspection was undertaken in April 2017 conducted by NSW Archaeology, Bega LALC and Roads and Maritime. The Roads and Maritime Aboriginal Cultural Heritage Officer inspected the site in March 2017.

The PACHCI, AHIMS search results and Due Diligence Assessment are provided in Appendix 5.

6.6.2 Potential impact
While Aboriginal objects are present within the region, the Due Diligence Assessment concluded that based on environmental grounds, and the extent of previous impacts, the activity area is not likely to be archaeologically sensitive. Accordingly, further archaeological assessment and an AHIP is not required.

A Stage 2 Clearance Letter is provided in Appendix 5.

6.6.3 Safeguards and management measures
The recommended safeguards and management measures to minimise the potential impact on aboriginal heritage are found in Table 6-6.

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental Safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal Heritage</td>
<td>• If Aboriginal heritage items are uncovered during the work, all work in the vicinity of the find must cease and the Roads and Contractor Construction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Kosciuszko Road (MR286) Barry Way to Alpine Way lane addition
Review of environmental factors
6.7 Non-Aboriginal Heritage

6.7.1 Existing environment

To enable an understanding of the existing environment, a search of relevant online databases was carried out. The databases consulted included:

- EPBC Act Protected Matters Search Tool (Appendix 3) within a 10 kilometres radius (DoE 2017)
- Australian Heritage Database within the Snowy River LGA (DoE 2017)
- State Heritage Inventory within the Snowy River LGA (OEH 2017)
- s.170 NSW State Agency Heritage Register, within the Snowy River LGA (OEH 2017)
- Snowy River LEP 2013.

The relevant results of the searches are provided in Appendix 6.

There are no listed heritage items within the study area. Lake Jindabyne is mapped as a Conservation Area - General (Heritage Map - Sheet HER_003A), as listed under the Snowy Rivers LEP 2013, Schedule 5 Environmental Heritage, Part 2 Heritage Conservation Areas (see Figure 6-3). Lake Jindabyne is also listed on the State Heritage Register and the Australian Heritage Register, so it is critical that the proposal does not negatively impact these heritage items through indirect impacts such as erosion and sedimentation.

A stone wall above an existing culvert within the proposal area was identified by NSW Archaeology as having no heritage significance. Therefore, the stone wall is of no constraint to the proposal.
6.7.2 Potential impact
There is the potential for the proposal to indirectly impact on Lake Jindabyne which is listed within the schedules of the Snowy River LEP 2013, the State Heritage Register and the Australian Heritage Register. The boundary of this item is about 100 metres from the proposal. Indirect impacts could include pollution due to erosion and sedimentation and hydrocarbon spills and loss of amenity and recreational value during construction. The removal of the stone wall above the existing culvert has no heritage significance according to NSW Archaeology.

6.7.3 Safeguards and management measures
The recommended safeguards and management measures to minimise the potential impact on Non-Aboriginal heritage are found in Table 6-7. Safeguards relating to water quality, traffic and social impacts are specified in sections 6.2, 6.4 and 6.8 of this REF respectively.

Table 6-7: Non-Aboriginal heritage safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Aboriginal Heritage</td>
<td>• If unexpected archaeological remains are uncovered during the work, all work must cease in the vicinity of the material/find and the steps in the Roads and Maritime Standard Management Procedure: Unexpected Archaeological Finds will be followed. Roads and Maritime Services Regional Environment Manager be contacted immediately. • If any items defined as relics under the NSW Heritage Act 1977 are uncovered during the work, all work must cease in the vicinity of the find and the Roads and Maritime Regional Environment Manager be contacted immediately.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
</tbody>
</table>

6.8 Air Quality

6.8.1 Existing environment
A review of the National Pollutant Inventory website (http://www.npi.gov.au) revealed that there are no listed sources of pollution within the Snowy River LGA.

Given that there are no pollution sources listed in the Snowy River LGA, there are unlikely to be any large scale facilities that affect air quality within the vicinity of the proposal. It is likely that exhaust fumes from vehicular traffic from the Kosciuszko Road as well as farm animals and wood heaters used in residences would be the main source of air pollution in the vicinity of the proposal given the moderate traffic levels and rural setting. Accordingly, air quality within the vicinity of the proposal is considered to be moderate to good.

Receivers sensitive to air quality impacts are consist with the identified noise sensitive receivers located adjacent to the proposed works (see Figure 6.2) as well as those located within the Leesville industrial area.
6.8.2 Air quality criteria

It is expected that construction vehicles and plant would be maintained to manufacturer’s standards. The Protection of the Environment Operations Act 1997 (POEO Act) requires that no vehicle shall have continuous smoky emissions for more than 10 seconds.

6.8.3 Potential impact

The proposal is unlikely to generate significant dust or air quality impact. Small quantities of dust could occur from cutting and filling activities. Stockpiled material may also generate dust. There is the potential that a lime spreader would be utilised where needed for this proposal. Levels of dust are unlikely to impact sensitive receivers however, in the short term, minor impact could occur to traffic.

Construction equipment and plant used on site would emit exhaust fumes and would contribute to local air quality. However, in the context of the existing vehicular movements along the Kosciuszko Road, this is expected to be negligible.

6.8.4 Safeguards and management measures

The recommended safeguards and management measures to minimise the potential impact on air quality are detailed in Table 6-8.

Table 6-8: Air quality safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
</table>
| Air quality  | • Measures (including watering or covering exposed areas) must be used to minimise or prevent air pollution and dust  
• Work must not to be carried out during strong winds or in weather conditions where high levels of dust or airborne particulates are likely  
• Vegetation or other materials must not to be burnt on site  
• Vehicles transporting waste or other materials that may produce odours or dust must be covered during transportation  
• Stockpiles or areas that may generate dust must be managed to suppress dust emissions in accordance with the Roads and Maritime Stockpile Site Management Guideline (2015). |
|              | Contractor                                                                                                                                                                                                                                                                                                                                            | Construction   |

6.9 Landscape Character and Visual Amenity

6.9.1 Existing environment

The existing environment and the potential impact of the proposal are considered in the context of the Roads and Maritime Landscape character and visual amenity Guidance Note (EIA-N04).

Landscape Character

The landscape west of Jindabyne is predominantly an open modified landscape that has been shaped by historical clearing and generally agricultural land. It comprises rolling hills set within a large flooded basin that forms Lake Jindabyne and is surrounded by hills in all directions. The landscape is characterized by the large area of Lake Jindabyne. Tracts of remnant and planted eucalypt trees remain and lines of windbreaks of exotic plant species are planted around the Lake foreshore.
Structures within the landscape are a school, the Essential Energy depot, Lake Jindabyne Yacht Club and tourist accommodation. Most access roads to these properties are sealed.

Kosciuszko Road runs east-west through this rural landscape. There are views from the road over Lake to the north, east and west towards the rolling vegetated hills.

The township of Jindabyne is perched on the foreshore of Lake Jindabyne after it was relocated from its former location in the 1960s which is now under the water of Lake Jindabyne. Jindabyne is a small town which a population of around 1,800 people. It is a popular holiday destination, especially in winter, due to its proximity to several ski resorts including Thredbo and Perisher.

Visual Catchment

The visual catchment of the proposed work is defined by the area within which the work would be clearly visible as shown in the visual envelope map (Figure 6-5). Topography has an influence on the visual catchment, for example, a ridge runs parallel to the southern boundary of the proposal which obscures the site from the view of most rural residential properties in Jindabyne.

The catchment is split into two zones of impact (Figure 6-5). The primary zone covers properties in close proximity to the site of the proposed work ranging from immediately adjacent the site to recreational users on the Lake Jindabyne and the foreshore. The secondary zone covers properties and places that will have distant views of the proposed work and that are located greater than 500 metres from the proposal (eg., Figure 6-6).

There are four clusters sensitive receivers of the proposed work (Figure 6-5). View points from some of these are provided (Figure 6-7, 6-8).
Figure 6-5 Visual envelope map

Figure 6-6: Fleeting view of the proposal (white line) from Kosciuszko Road travelling towards Jindabyne.
6.9.2 Potential impact

Landscape Character

The proposal would be visible to motorists travelling on the road, recreational users of Lake Jindabyne and the foreshore area. However, these impacts would be minimal in the context of the wider open landscape, particularly after regeneration of vegetation on batters. The magnitude of the project is therefore considered to be low, giving a rating of low impact on landscape character.

Visual Catchment
The potential level of impact to each of the viewpoints is detailed in Table 6-9. This table details the magnitude of the proposed work in terms of visual change in the landscape and proximity to the viewpoint, and the degree of sensitivity based on the quality of the view, whether the site is clearly visible or obscured by landform or vegetation, the direct and composition of the view, and how sensitive the view is to changes in the landscape that will result from the proposed works.

A rating is then given based on magnitude and sensitivity.

Table 6-9: Summary of potential impacts to viewpoints

<table>
<thead>
<tr>
<th>Setting</th>
<th>Magnitude</th>
<th>Sensitivity</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snowy Mountains Grammar School</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Lake Jindabyne Yacht Club</td>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Shared Trail</td>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Essential Energy Depot</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Discovery Parks Jindabyne</td>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
</tr>
</tbody>
</table>

The potential visual amenity impacts of the proposed work would include the removal of vegetation (native and introduced) and exposed soil surfaces. The removal of native vegetation (trees and groundcover) would expose areas of bare soils, which would represent a short-term, temporary change to visual amenity while regeneration occurs. Exposure of soils can also increase the potential for weeds to spread due to the disturbance which is often beneficial to many of these species. The properties most affected by the proposed work are those in the primary zone and those directly adjacent to the proposal. Other viewpoints within the primary zone should experience low to moderate impact due to the topography, and the presence of screening vegetation.

Local residents and road users would be the main receivers of these changes to the visual amenity. Road users would only be subject to fleeting views as they pass the proposal. This would be on a temporary basis during the construction work. Given these factors, the magnitude of the potential impact is considered to be low.

Views to Lake Jindabyne from the road would not be impacted. No additional operational impacts to landscape character or visual amenity are anticipated as a result of the proposal.

The proposed works are unlikely to degrade the existing landscape character of Lake Jindabyne, given the relatively minor nature of the proposal in context with the large area covered by Lake Jindabyne.

The impacts to landscape character and visual impact are acceptable subject to the safeguards detailed in Table 6.9.

6.9.3 Safeguards and management measures

The recommended safeguards and management measures to minimise the potential impact on visual amenity are found in Table 6-10.

Table 6-10: Visual amenity safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual amenity</td>
<td>- Work areas will be stabilised progressively during the work to minimise potential erosion impacts. These areas will be stabilised using an appropriate seeding mix.</td>
<td>Contractor</td>
<td>Construction/Post Construction</td>
</tr>
</tbody>
</table>
6.10 Socio-economic

6.10.1 Existing environment

This section of Kosciuszko Road serves to route all traffic from NSW to the snow fields during the snow season between June and October. During the snow season this section of road sees a large volume of traffic in the westbound direction in the morning as road user’s travel up to the snow fields. Conversely, in the evening, the eastbound direction experiences a large volume of traffic as road user’s leave the snow field.

While summer traffic volumes do not reach winter levels, the area is popular in summer as a tourist destination and the Alpine Way provides a through road into Victoria. During this period there are motorcycle, bicycle, water ski and numerous music events and festivals.

Located within or close to the proposal footprint are two access roads for the Lake Jindabyne Yacht Club and the Essential Energy Jindabyne Depot. The road would therefore also be considered an important thoroughfare for local residents and business owners in the locality.

6.10.2 Potential impact

The potential impacts to socio-economic factors that are related to this proposal include the disruption of the ability of local business to operate on a normal basis or impacts to tourism or local events. This would be associated with the traffic disruptions caused by the proposed work.

The work schedule has been designed to avoid major impacts to traffic by avoid the winter snow season. However, at other times, a reduced speed limit of 40km/h would apply, and some traffic control may be required at times. There may also be stop slow lane closures with delays of up to 5 minutes possible. This may result in minor impacts to local tourism events.

These disruptions are considered to be relatively minor and offset by the improvement in the road quality which would increase efficiency and safety of the road in the long term. The impacts to traffic and the mitigation measures to minimise the impact including a traffic management plan, have been considered further in Section 6.4 - Traffic and Access.

6.11 Cumulative Impact

6.11.1 Existing environment

Roads and Maritime Services are currently planning work to improve traffic efficiency and road safety on Monaro Highway and Kosciuszko Road. The scope of works being investigated includes additional overtaking lanes between the NSW border and Jindabyne – the total number and location of these overtaking lanes is currently being investigated. Planning work already carried out includes ground investigations at potential locations along the route, traffic counts and modelling and preparing concept designs. A number of slope stability projects are also being developed for Kosciuszko Road east of Jindabyne and the Alpine Way near Thredbo.

Therefore there could be some cumulative impact on vegetation communities especially to Snow Gum Grassy Woodland which would potentially be impacted by other works proposed for Kosciuszko Road however this is difficult to quantify without concept designs for the proposals.

There are a large number of other projects that could potentially be carried out in the region, as listed on the NSW Department of Planning website. These projects would not directly impact on Kosciuszko Road however they could result in the removal of Snowy Gum Grassy Woodland TEC.

The improvement in efficiency of Kosciuszko Road, justifies the impact.
6.11.2 Negative cumulative impact

A number of actions as a result of the proposed work would have a negative cumulative impact. These include:

- Social impact during the construction period based on minor traffic disruptions, dust and noise
- Biodiversity impact resulting from soil disturbance and the clearing of vegetation including a TEC.

Generally, negative cumulative impact associated with the proposal would be confined to the construction period and those associated with all proposals have been assessed as being of ‘non-significance’. Proposed safeguards detailed within the REF confirm that risks from potential impact are both low and manageable.

6.11.3 Positive cumulative impact

Positive cumulative impact as a result of the proposal is expected to be:

- Collaboration between stakeholders to manage the reuse of waste which would create a benefit to the wider region
- Continued improvements in road user safety by improving Kosciuszko Road
- Continued improvements in efficiency by improving traffic flow on Kosciuszko Road.
7 Environmental management

7.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

A Construction Environmental Management Plan (CEMP) will be prepared to describe safeguards and management measures identified. This plan will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The plan will be prepared prior to construction of the proposal and must be reviewed and certified by the Roads and Maritime Services Environment Officer, Southern Region, prior to the commencement of any on-site work. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP would be developed in accordance with the specifications set out in the QA Specification G36 – Environmental Protection (Management System), QA Specification G38 – Soil and Water Management (Soil and Water Plan) and the QA Specification G40 – Clearing and Grubbing.

7.2 Summary of safeguards and management measures

Environmental safeguards outlined in this document would be incorporated into the detailed design phase of the proposal and during construction and operation of the proposal, should it proceed. These safeguards would minimise any potential adverse impacts arising from the proposed work on the surrounding environment. The safeguards and management measures are summarised in Table 7-1.
Table 7-1: Summary of site specific environmental safeguards

<table>
<thead>
<tr>
<th>No.</th>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
</table>
| 1   | General  | • All environmental safeguards must be incorporated within the following:  
  - Detailed design stage  
  - Contract specifications for the proposal  
  - Construction Environmental Management Plan  
  - Environmental Work Method Statements                                                                 | Project manager                 | Pre-construction    |
| 2   | General  | • A risk assessment must be carried out on the proposal in accordance with the Roads and Maritime Services Project Pack and PMS risk assessment procedures to determine an audit and inspection program for the work. The recommendations of the risk assessment are to be implemented  
  • A review of the risk assessment must be carried out after the initial audit or inspection to evaluate is the level of risk chosen for the project is appropriate  
  • The proposal will be subject to environmental audit(s) and/or inspection(s) at any time during construction. | Project manager and regional environmental staff | Pre-construction, After first audit |
| 3   | General  | • The environmental contract specification must be forwarded to the Roads and Maritime Services Environment Manager Southern Region for review at least 10 working days prior to the tender stage  
  • A contractual hold point must be maintained until the CEMP is reviewed by the Roads and Maritime Services Environment Manager Southern Region. | Project manager                 | Pre-construction    |
<p>| 4   | General  | • The Roads and Maritime Services Project Manager must notify the Roads and Maritime Services Environment Officer Southern Region at least ten working days prior to work commencing. | Project manager                 | Pre-construction    |
| 5   | General  | • All businesses and residences likely to be affected by the proposed work must be notified at least 10 working days prior to the commencement of the proposed activities. | Project manager                 | Pre-construction    |
| 6   | General  | • At induction environmental awareness training must be provided, by the contractor, to all field personnel and subcontractors                                                                                         | Contractor                      | Pre-construction and during |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>General</td>
<td>• Ongoing environmental toolbox discussions will be provided by the Contractor as the work progresses.</td>
<td>Project Manager, Roads and Maritime Environmental Officer, Site Manager</td>
<td>Pre-construction, construction and operation</td>
</tr>
<tr>
<td>8</td>
<td>Removal of native vegetation</td>
<td>• Any change in the project scope of works must be reviewed by the regional environment section to assess consistency with the project environmental assessment and approval.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
</tbody>
</table>
| 10  | Removal of threatened species habitat and habitat features | • Exclusion zones must be established around any areas of TEC that are outside the limit of clearing.  
• Should disturbed soil within the proposal footprint (such as cuttings) be exposed for lengthy periods, these areas will be stabilised using an appropriate seeding mix to minimise potential erosion impacts. | Contractor                                           | Construction                           |
<p>| 11  | Removal of threatened plants                 | • Habitat removal must be carried out in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011). | Contractor                                           | Construction                           |
| 13  | Injury and mortality of fauna                | • The unexpected species find procedure will be followed under Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011), if threatened flora species not assessed in the biodiversity assessment, are identified in the proposal site. | Contractor                                           | Construction                           |
| 14  | Invasion and spread of weeds                 | • Fauna will be managed in accordance with Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011). | Contractor                                           | Construction                           |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
</table>
| 16  | Erosion and sedimentation      | • Erosion and sediment control measures must be implemented and maintained to:  
  • Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets.  
  • Reduce water velocity and capture sediment on site.  
  • Minimise the amount of material transported from site to surrounding pavement surfaces.  
  • Divert clean water around the site.  
  (in accordance with the Landcom/Department of Housing *Managing Urban Stormwater, Soils and Construction Guidelines* (the Blue Book 1 & 2))  
  • Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request  
  • Erosion and sediment control measures are not to be removed until the work is complete and areas are stabilised  
  • Work areas will be stabilised progressively during the work  
  • The maintenance of established stockpile sites during work must be in accordance with the Roads and Maritime *Stockpile Site Management Guideline, 2015*. | Contractor     | Construction   |
| 17  | Water quality                  | • There must be no release of dirty water into drainage lines and/or waterways  
  • Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/slicks) must be carried out on a regular basis to identify any potential spills or deficient erosion and sediment controls  
  • Water quality control measures must be used to prevent any materials (e.g. concrete, grout, sediment etc.) entering drain inlets or waterways  
  • An Environmental Work Method Statement must be prepared for culvert extension and relining activities. | Contractor     | Construction   |
| 18  | Chemical runoff                | • Fuels, chemical and liquids must be stored in an impervious bunded area a minimum of 50 metres away from:  
  • Rivers, creeks, or any areas of concentrated water flow. | Contractor     | Construction   |
<table>
<thead>
<tr>
<th>No.</th>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
</table>
| 19  | Waste minimisation and management | • Resource management hierarchy principles must 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 carried out as a last resort (in accordance with the Waste Avoidance & Resource Recovery Act 2001).  
  • A Section 143 form must be completed for project waste (eg. fill) sent to a site not owned by the Roads and Maritime Services (excluding Office and Environment and Heritage licensed landfills) for land disposal in accordance with the Roads and Maritime Technical Guide Management of Road Construction and Maintenance Wastes  
  • Waste must not be burnt onsite  
  • Waste material other than vegetation and tree mulch, must not to be left on site once the work has been completed  
  • Working areas must be maintained, kept free of rubbish and cleaned up at | Contractor | Construction |
<table>
<thead>
<tr>
<th>No.</th>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>the end of each working day.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A Mulch Management Plan must be prepared if mulch is to be disposed of offsite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Traffic and Access</td>
<td>• Consultation with stakeholders and the community will be carried out by Roads and Maritime</td>
<td>Contractor</td>
<td>Pre-construction/ Construction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Current traffic movements and property accesses must be maintained during the work, where possible</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A traffic management plan must be prepared in accordance with the Traffic Controls at Work Sites Manual be prepared prior to work commencing and must accommodate the needs of planned community events.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Activities that would impact traffic must be not be undertaken throughout the peak winter period.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Noise and vibration</td>
<td>• Construction noise and vibration impacts will be managed in accordance with a Noise Management Plan prepared with consideration of the Roads and Maritime Construction Noise and Vibration Guideline</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>22</td>
<td>Aboriginal Heritage</td>
<td>• If Aboriginal heritage items are uncovered during the work, all work in the vicinity of the find must cease and the Roads and Maritime Aboriginal Cultural Heritage Officer and the regional Environment Officer be contacted immediately. Steps in the Roads and Maritime Standard Management Procedure: Unexpected Archaeological Finds will be followed.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• If any items defined as relics under the NSW Heritage Act 1977 are uncovered during the work, all work must cease in the vicinity of the find and the Roads and Maritime Regional Environment Manager be contacted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Non-Aboriginal Heritage</td>
<td>• If unexpected archaeological remains are uncovered during the work, all work must cease in the vicinity of the material/find and the steps in the Roads and Maritime Standard Management Procedure: Unexpected Archaeological Finds will be followed. Roads and Maritime Services Regional Environment Manager be contacted immediately</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>No.</td>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
<td>Timing</td>
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</tr>
</tbody>
</table>
| 24  | Air quality | • Measures (including watering or covering exposed areas) must be used to minimise or prevent air pollution and dust  
• Work must not to be carried out during strong winds or in weather conditions where high levels of dust or airborne particulates are likely  
• Vegetation or other materials must not to be burnt on site  
• Vehicles transporting waste or other materials that may produce odours or dust must be covered during transportation  
• Stockpiles or areas that may generate dust must be managed to suppress dust emissions in accordance with the Roads and Maritime Stockpile Site Management Guideline (2015) | Contractor | Construction |
| 25  | Landscape Character and Visual Amenity | • Work areas will be stabilised progressively during the work to minimise potential erosion impacts. These areas will be stabilised using an appropriate seeding mix. | Contractor | Construction/Post Construction |
### 7.3 Licensing and approvals

Licensing and approvals will be required for this proposal. Table 7-2 provides a summary.

Table 7-2: Summary of licensing and approval required

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minister for Primary Industries (Fisheries) would be notified of any work in the drainage line prior to the carrying out of such work.</td>
<td>A minimum of 28 days prior to the commencement of work.</td>
</tr>
<tr>
<td>The proposal would require an Environment Protection Licence (EPL) as it meets the definition of ‘extractive activities’ under clause 19 of Schedule 1</td>
<td>Prior to work commencing</td>
</tr>
</tbody>
</table>
8 Conclusion

8.1 Justification

The “do nothing” option would result in no impact to vegetation and the surrounding environment and no impact to traffic. It also means that the efficiency of Kosciuszko Road would remain compromised for road users for the foreseeable future.

The Roads and Maritime has an obligation to provide safe conditions for road users. The proposal would improve the efficiency of Kosciuszko Road by carrying out the proposed work. This improvement in safety for road users is considered to outweigh the potential impact associated with the proposal and therefore the proposal is justified.

8.2 Objects of the EP&A Act

Table 8-1: Objects of the EP&A Act

<table>
<thead>
<tr>
<th>Object</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>5(a)(i) To encourage the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment.</td>
<td>This proposal encourages proper management of the road network and would improve the social and economic welfare of the community by improving the efficiency of Kosciuszko Road.</td>
</tr>
<tr>
<td>5(a)(ii) To encourage the promotion and co-ordination of the orderly economic use and development of land.</td>
<td>Not relevant to the proposal.</td>
</tr>
<tr>
<td>5(a)(iii) To encourage the protection, provision and co-ordination of communication and utility services.</td>
<td>Not relevant to the proposal.</td>
</tr>
<tr>
<td>5(a)(iv) To encourage the provision of land for public purposes.</td>
<td>Not relevant to the proposal.</td>
</tr>
<tr>
<td>5(a)(v) To encourage the provision and co-ordination of community services and facilities.</td>
<td>Not relevant to the proposal.</td>
</tr>
<tr>
<td>5(a)(vi) To encourage the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats.</td>
<td>This REF lists safeguards and management measures to mitigate and minimise the potential impact on the environment including native animals and plants including threatened species (BA, Appendix 3).</td>
</tr>
<tr>
<td>5(a)(vii) To encourage ecologically sustainable development.</td>
<td>Ecologically sustainable development is considered in Sections 8.2.1 – 8.2.4 below.</td>
</tr>
<tr>
<td>5(a)(viii) To encourage the provision and maintenance of affordable housing.</td>
<td>Not relevant to the proposal.</td>
</tr>
</tbody>
</table>
8.2.1 The precautionary principle

The ‘precautionary principle’ means that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

This REF has been prepared using the precautionary principle. That is, if threats are perceived as possibly leading to serious or irreversible environmental damage, then either the non-development of the proposal would occur, or that the proposal would need to be modified to ensure that such threats do not exist. This has been the approach in relation to proposed safeguards detailed in Chapter 6 and summarised in Chapter 7.

8.2.2 Intergenerational equity

'Inter-generational equity' means that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

The proposal would not impact on natural or cultural features to a level that would compromise the health, diversity or productivity of the environment to a level that would impact on future generations.

8.2.3 Conservation of biological diversity and ecological integrity

This principle requires that “costs to the environment should be factored into the economic costs of a project”.

The REF has examined the environmental consequences of the proposal and identified mitigation measures for areas which have the potential to experience adverse impact. Requirements imposed in terms of implementation of these mitigation measures would result in an economic cost to Roads and Maritime. The implementation of mitigation measures would increase both the capital and operating costs of the proposal. This signifies that environmental resources have been given appropriate valuation.

The design for the proposal has been developed with an objective of minimising potential impact on the surrounding environment. This indicates that the concept design for the proposal has been developed with an environmental objective in mind.

8.2.4 Improved valuation, pricing and incentive mechanisms

This principle requires that environmental assets should be appropriately valued. This REF has considered abiotic and biotic ecosystem factors together with social values in identifying potential impact and providing a range of environmental safeguards to minimise the impact of the proposal.

These factors ensure that the proposed activity is consistent with the principles of ESD.
8.3 Conclusion

The proposal to improve traffic efficiency between Barry Way and Alpine Way on Kosciuszko Road by constructing an additional westbound lane is subject to assessment under Part 5 of the EP&A Act. The REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity. This has included consideration of conservation agreements and plans of management under the NPW Act, joint management and biobanking agreements under the TSC Act, wilderness areas, critical habitat, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants.

A number of potential environmental impacts from the proposal have been avoided or reduced during the concept design development and options assessment. The proposal as described in the REF best meets the project objectives but would still result in some impacts on the TSC Act listed Threatened Ecological Community Snow Gum Grassy Woodland. Mitigation measures as detailed in this REF would ameliorate or minimise these expected impacts. The proposal would also improve road user efficiency of Kosciuszko Road. On balance the proposal is considered justified.

The environmental impacts of the proposal are not likely to be significant and therefore it is not necessary for an environmental impact statement to be prepared and approval to be sought for the proposal from the Minister for Planning under Part 5.1 of the EP&A Act. The proposal is unlikely to affect threatened species, populations or ecological communities or their habitats, within the meaning of the Threatened Species Conservation Act 1995 or Fisheries Management Act 1994 and therefore a Species Impact Statement is not required. The proposal is also unlikely to affect Commonwealth land or have an impact on any matters of national environmental significance.
This review of environmental factors provides a true and fair review of the proposal in relation to its potential 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.

Joshua Wellington  
Senior Project Officer  
EnviroKey Pty. Ltd.  
Date: 30/06/2017

Certified by:

Steve Sass  
Director/Principal Ecologist  
EnviroKey Pty. Ltd.  
Date: 02/07/2017

I have examined this review of environmental factors and the certification by Steve Sass from EnviroKey Pty. Ltd. and accept the review of environmental factors on behalf of Roads and Maritime Services.

Shaun Foster  
Project Manager  
Roads and Maritime Services Southern Region  
Date:
References


DPC. (2011) NSW 2021: A Plan to Make NSW No. 1. NSW Department of Premier and Cabinet.

DPI. (2013) Policy and guidelines for fish habitat conservation and management. Department of Primary Industries.

DPI. (2016) NSW Noxious Weed Declarations.


### Terms and acronyms used in this REF

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHIMS</td>
<td>Aboriginal Heritage Information Management System</td>
</tr>
<tr>
<td>BBAM</td>
<td>Biometric/Biobanking Assessment Methodology</td>
</tr>
<tr>
<td>BVT</td>
<td>Biometric Vegetation Type</td>
</tr>
<tr>
<td>CMA</td>
<td>Catchment Management Authority</td>
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<tr>
<td>CEMP</td>
<td>Construction environmental management plan</td>
</tr>
<tr>
<td>DPI</td>
<td>NSW Department of Primary Industries</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental impact assessment</td>
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<tr>
<td>EP&amp;A Act</td>
<td><em>Environmental Planning and Assessment Act 1979</em> (NSW). Provides the legislative framework for land use planning and development assessment in NSW</td>
</tr>
<tr>
<td>ESD</td>
<td>Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased</td>
</tr>
<tr>
<td>FM Act</td>
<td><em>Fisheries Management Act 1994</em> (NSW)</td>
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<tr>
<td>Heritage Act</td>
<td><em>Heritage Act 1977</em> (NSW)</td>
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<tr>
<td>HBT</td>
<td>Hollow-bearing tree</td>
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<tr>
<td>ISEPP</td>
<td>State Environmental Planning Policy (Infrastructure) 2007</td>
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<tr>
<td>LALC</td>
<td>Local Aboriginal Land Council</td>
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<tr>
<td>LGA</td>
<td>Local government area</td>
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<tr>
<td>NES</td>
<td>Matters of national environmental significance under the Commonwealth <em>Environment Protection and Biodiversity Conservation Act 1999</em>.</td>
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<tr>
<td>Noxious Weeds Act</td>
<td><em>Noxious Weeds Act 1993</em> (NSW)</td>
</tr>
<tr>
<td>NPW Act</td>
<td><em>National Parks and Wildlife Act 1974</em> (NSW)</td>
</tr>
<tr>
<td>OEH</td>
<td>NSW Office of Environment and Heritage</td>
</tr>
<tr>
<td>PACHCI</td>
<td>Procedure for Aboriginal Cultural Heritage Consultation and Investigation</td>
</tr>
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<td>REF</td>
<td>Review of environmental factors</td>
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<tr>
<td>SEPP44</td>
<td>State Environmental Planning Policy No.44 – Koala Protection</td>
</tr>
<tr>
<td>SIS</td>
<td>Species Impact Statement</td>
</tr>
<tr>
<td>TEC</td>
<td>Threatened Ecological Community</td>
</tr>
<tr>
<td>TSC Act</td>
<td>Threatened Species Conservation Act 1995 (NSW)</td>
</tr>
<tr>
<td>VMS</td>
<td>Variable Message Sign</td>
</tr>
<tr>
<td>QA Specifications</td>
<td>Specifications developed by Roads and Maritime Services for use with roadworks and bridgeworks contracts let by Roads and Maritime Services</td>
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