Environmental Impact Statement

PROPOSED HARD ROCK QUARRY

LOTS 62,76,78,106 & 120 DP 750540
No. 278 SPRINGS ROAD, ROCK FLAT, NSW

Prepared by:

Outline Planning Consultants Pty. Limited
Town Planning Consultants
Suite 18, Pittwater Business Park
5 Vuko Place
WARRIEWOOD NSW 2102

ABN: 34 003 473 112

Telephone: (02) 9262 3511
www.outline.com.au

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On behalf of:

SQ Licences Pty Ltd
& Schmidt Quarries
12 Bass Street
QUEANBEYAN NSW 2620

ABN: 619 729 298

Telephone: (02) 6298 1355

EIS DECLARATION

EIS prepared by:

Name:	Gary William Peacock
Qualifications:	Bachelor of Town Planning (UNSW)
Address:	Outline Planning Consultants Pty Ltd Suite 18, Pittwater Business Park,No. 5 Vuko Place, WARRIEWOOD NSW 2102
in respect of:	Proposed new hard rock quarry at Rock Flat, NSW

Development Application

Applicant name:	SQ Licences Pty Ltd & Schmidt Quarries (the quarry operator)
Applicant address:	c/- Outline Planning Consultants Pty Ltd Suite 18, Pittwater Business Park, No. 5 Vuko Place, WARRIEWOOD NSW 2102
Land to be developed:	Lots 62,76,78,106 & 120 DP750540, No. 278 SPRINGS ROAD (MONARO HIGHWAY), ROCK FLAT NSW

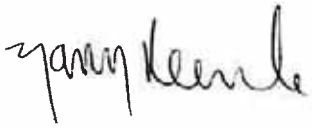
Environmental Impact Statement

An Environmental Impact Statement (EIS) is attached

I certify that I have prepared the contents of this Statement and to the best of my knowledge:

- the statement contains all available information that is relevant to the environmental assessment of the development to which the statement relates, and
- it is true in all material particulars and does not, by its presentation or omission of information, materially mislead

Signature:



Name: Gary William Peacock, Director,
Outline Planning Consultants Pty Limited

Date: February 2018

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Executive Summary

Overview of the Project and the Site

The Applicant and quarry operator, SQ Licences Pty Ltd and Schmidt Quarries, proposes the establishment of a new quarry on land covering Lot 62,76,78, 106 & 120 in Deposited Plan 750540, No. 278 Springs Road, Rock Flat, located about 14km to the south of Cooma, on the Monaro Plain in the NSW Southern Tablelands (the Project Site). The land proposed for quarrying and allied operational activities, including stockpiles, bunds, sediment basins and crushing plant, is referred to as the quarry site. Refer **Figures 0.1** and **0.2**.

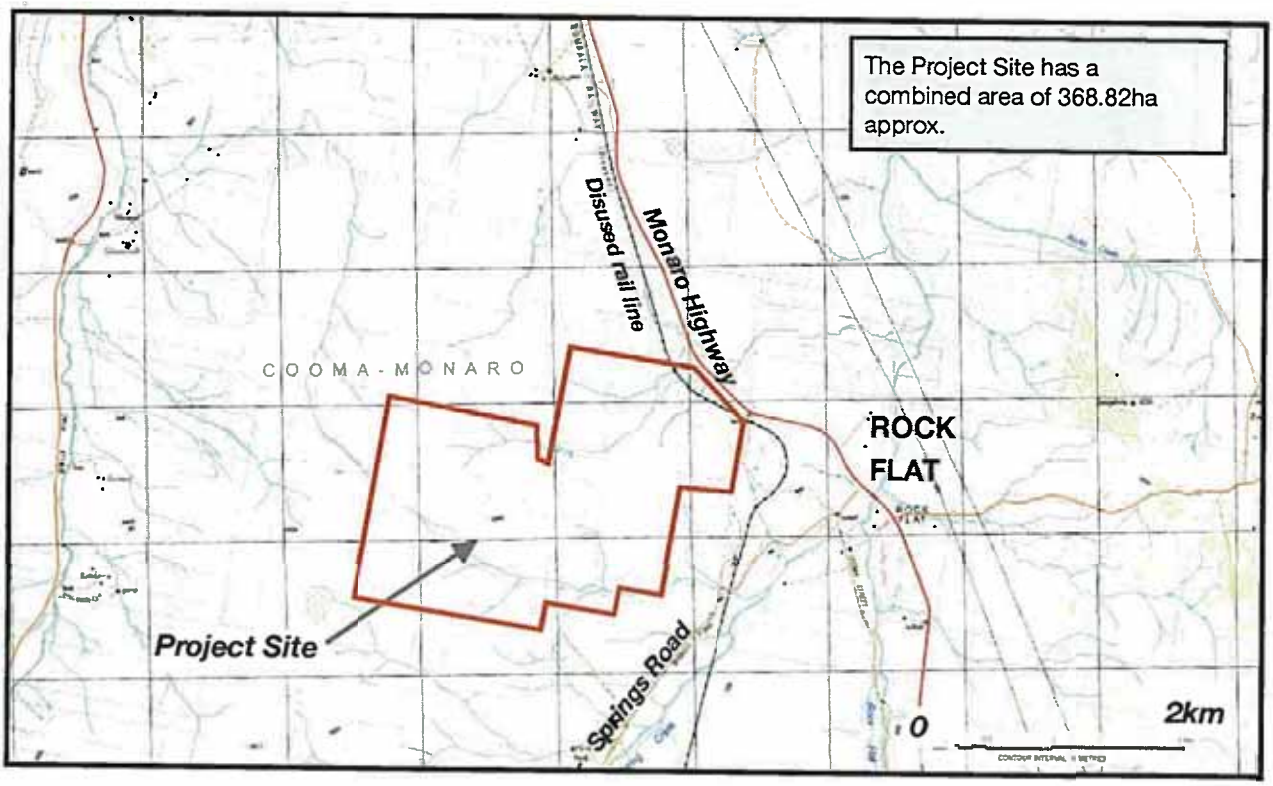


FIGURE 0.1: Location of Project Site

(Map Base Source: excerpt Land and Property Information Jillimatong 1:25,000 online map)

It is proposed to extract approximately 4.6 million tonnes from the site- in practice less after allowing for losses due to provision for internal haul roads, overburden, quarry benching and the like. Annual production is anticipated to be up to 280,000 tonnes per annum, averaging about 150,000 tonnes per annum. Testing of the rock indicates that it will produce materials that will meet the requirements of the Australian Standards AS2758 Aggregates and rock for engineering purposes. Refer to **Appendix A** for copy of Development application.

The first stage of the development involves the construction of the working quarry area including sedimentation dams, preparation of the plant site, establishment of the quarry face and facilities (i.e. office, crushers, weigh-bridge, workshops, and the like) and construction of the internal quarry haul route from the Monaro Highway, allowing for quarry truck traffic and other vehicles to turn safely into the quarry.The EIS seeks consent to establish a new quarry on the project site, having an overall footprint of 14.2ha including 7.03ha devoted to the actual extraction area and to allow production of up to 100,000 cubic metres (approx. 280,000 tonnes) per annum of quarry product (the Project, the quarry development). Refer **Figure 0.2** and **Figure 0.3** showing the extent of the proposed quarry.

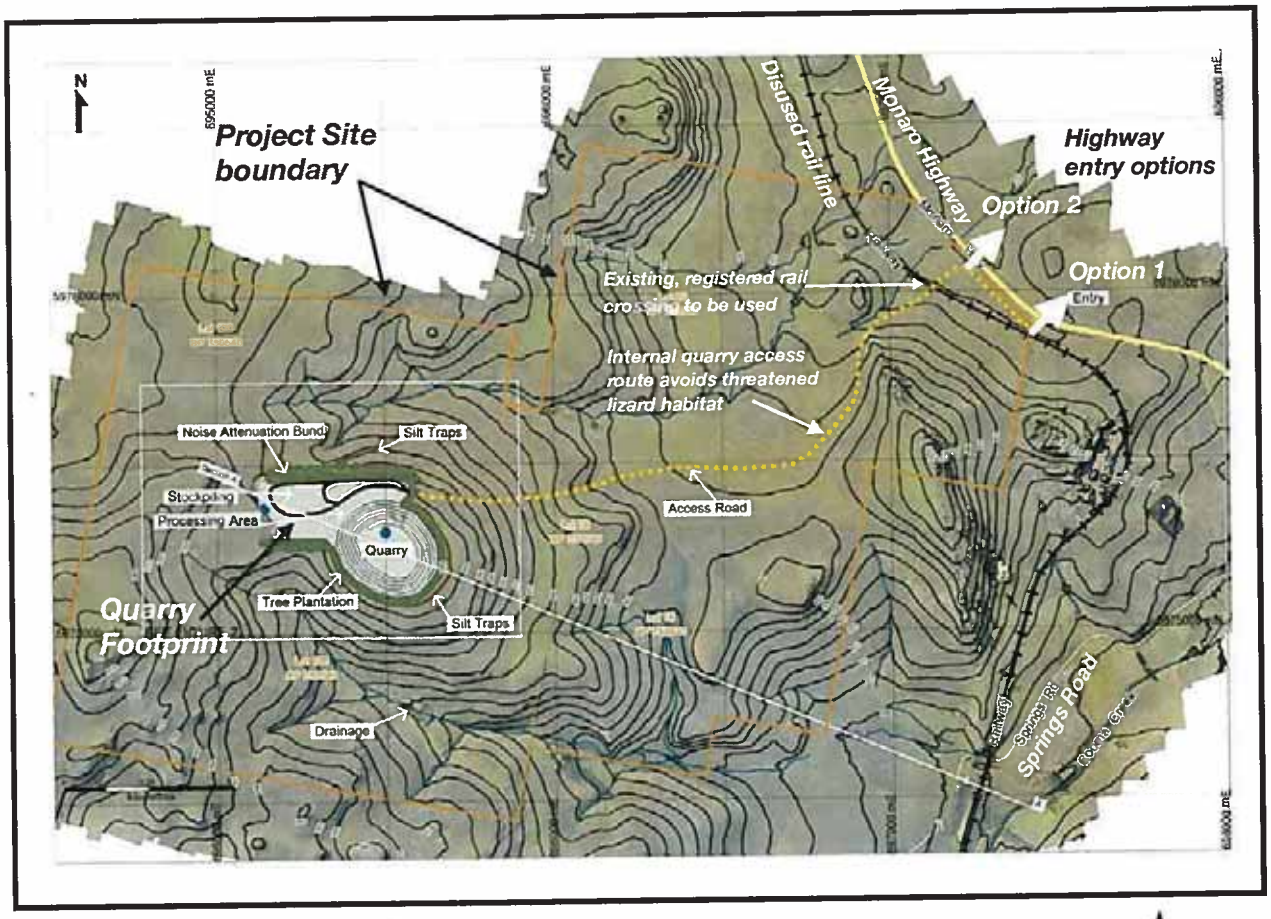


FIGURE 0.2: Proposed quarry & quarry haul route to highway

(Map Base Source: Tanand)

▪ Justification, Summary of Project

The location of the quarry is determined by the presence of the resource of a quality to warrant ongoing extraction. Refer to petrographic test of the resource in **Appendix C**.This project, if approved, will provide a long-term, high quality supply of hard rock material into the local and regional markets.

Approval of this resource is urgently needed to replace supply from Schmidt Quarries' existing Nimmitabel quarry, located some 12km to the south, that is nearing the end of its economic life. The Nimmitabel resource is almost exhausted- hence the urgent need for a new quarry to be established on the Project Site. It too is a volcanic plug, similar to that now found on the Project Site.

The project site is located in a remote rural area. The combined effect of this remoteness and the design of the quarry means that quarry operations will be satisfactorily buffered from rural dwellings nearby. The quarry site has been identified as a high quality volcanic rock well suited to aggregate production and other similar quarry products.

Approval of this new quarry will enable Schmidt Quarries to continue to operate as a reliable, environmentally responsible supplier of quarry products to the region to meet the expected ongoing demand for quarry products region. The Project will assist in meeting the demand for quarry products in the region in the future. The quarry is well positioned to service various roads and associated projects to the north and to the east and to the south. Refer Table 0.1.

Table 0.1: Summary of the Project

Project Element	Summary
Quarrying Method	Establishment of new quarry. Rock to be won by blasting and then crushed prior to being transported from the site
Resource	Hard rock resource from volcanic plug- similar to that currently being quarried at Schmidt Quarries' current operation at nearby Nimmitabel. It is proposed to win 4.6 million tonnes approx. from this new quarry
Need for New Quarry	Schmidt Quarries needs to urgently replace its existing quarry at Nimmitabel, where the resource is almost exhausted (the current consent for this quarry allows up to 100,000 cubic metres (approx. 280,000 tonnes) per annum of production- the same as that sought at new quarry at Rock Flat)
Disturbance Area	The proposed quarry pit has an area of 7.03ha approx. The quarry infrastructure area, including stockpile areas and processing area, has an area of 6.18ha, with an additional 1.0ha for bunds and new planting areas. The proposed quarry haul road has a length of approx. 2.267km and avoids the known habitat of threatened lizard species
Annual Production	Maximum of 100,000 cubic metres (approx. 280,000 tonnes) with an average of 150,000 tonnes per annum
Quarry Management	The company's Nimmitabel quarry operates under an Integrated Risk Quarry Management System that covers health and safety, environmental management systems and quality maintenance issues based on Australian Standards, in accordance with an existing local council consent and an Environment Protection Licence from the NSW EPA. The intention is to apply the same or similar standards to the conduct of the proposed new quarry at Rock Flat
General Infrastructure	Working quarry, perimeter replanting areas, with other quarry infrastructure including office, amenities, workshop, as well as crushing and processing plant, product stockpiles, and sediment basin(s), bunds and replanting areas
Product Transport	Quarry material to be transported from the site using truck and 'dog' with a carrying capacity of up to 39 tonnes per load
Employment	The quarry will provide full-time and part-time employment for up to 6 persons on site
Hours of Operation	6.00 am and 6.00 pm Monday to Friday and 7.00am to 2.00pm on each Saturday
Rehabilitation	Establishment of perimeter pine tree plantings at project commencement, with replanting of tussock grasses as a part of the rehabilitation of the site

The Project involves the operation of a new quarry designed to ensure that environmental impacts are reduced to a satisfactory level. The impact assessment contained in this Environmental Impact Statement (EIS) demonstrates that the project complies with relevant planning and environmental legislation and meets many key environmental and operational requirements in terms of:

- Ease of access to a major road (Monaro Highway) and proximity to local markets.
- Good setbacks from existing rural residences, with limited views from nearby viewing points.
- Acceptable noise, blasting and air quality impacts, compliant with relevant EPA criteria.
- Small environmental footprint of the proposed quarry. The haul route has been designed to avoid the known habitat of the threatened Grassland Earless Dragon.
- Quarry deposit of suitable size and quality to meet the known needs of markets in the region.
- The Applicant's extensive experience and good environmental track record in carrying out extraction operations from a volcanic plug resource at Nimmitabel, similar to that on the Project Site. Schmidt Quarries intend to apply similar sound, proven quarry management measures to the Project Site as are currently being applied at the Nimmitabel quarry, couple with additional, site-specific mitigation measures.

▪ The Purpose of this Environmental Impact Statement (EIS)

This report comprises an Environmental Impact Statement (EIS) accompanying a development application under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) relating to the establishment of a proposed hard rock quarry on rural land at Rock Flat, NSW, as required by s.78A of the EP&A Act. The Project is 'Designated Development' pursuant to Schedule 3 of the NSW *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation 2000), requiring the preparation of an EIS. The development does not comprise State Significant Development. Being an extractive industry categorised as 'designated development' means that the determining authority is the Joint Regional Planning Panel (JRPP) pursuant to clause 20 of *State Environmental Planning Policy (State and Regional Development) 2011* and clause 8(a) of Schedule 4A of the EP&A Act.

A request for the issue of Secretary's Environmental Assessment Requirements (SEARs) for an EIS was sought by the Applicant, with the SEARs subsequently issued on 20 March 2017, including comments and advice from various state government agencies and departments based on the information furnished by the Applicant. Refer to **Appendix B**. If development consent is subsequently granted for the Project to proceed, an additional licence will be required to be issued by the NSW EPA prior to the commencement of certain site quarry-related activities. Projects requiring the issue of such a an license are classed under Section 91 of the EP&A Act as 'Integrated Development'.

▪ Planning Context

This EIS considers all relevant planning-related legislation in detail. The proposed quarry development is consistent with and/or complies with all relevant Acts, including State Environmental Planning Policies (SEPPs) and Commonwealth biodiversity legislation, applicable to the Project.The Project Site is zoned RU1 Primary Production under the provisions of the Cooma Monaro Local Environmental Plan 2013 (LEP).'Extractive industries" are a use permitted in the RU1 zone. The proposed development satisfies the relevant zone objectives and other relevant provisions of the LEP.

▪ Consultation

In accordance with the Secretary's Environmental Assessment Requirements (SEARS) there has been consultation with local and state government agencies, the local community (Quarry Fact Sheet distributed to residents- refer **Appendix D**) and others as a part of this project. Consultation was also undertaken with representatives of the local Aboriginal community as part of the Aboriginal archaeological and cultural heritage assessment process.

▪ Environmental Impacts and Mitigation Measures

This EIS provides an assessment of the environmental impacts of the proposed quarry on the Project Site, at Rock Flat, NSW in accordance with the Secretary's Environmental Assessment Requirements (SEARS) and after having prioritised all key SEARS issues of most relevance to this quarry development.

The EIS also provides details of the proposed measures at the Project Site to appropriately manage and mitigate potential impacts identified, arising from the proposed quarry expansion. The mitigation measures proposed for the project are practical, feasible and reasonable from a cost and engineering perspective. The mitigation strategies outlined includes the environmental management principles which would be followed in the planning, design, construction and operation of the proposal, if approved, providing the basis for the implementation of a formal quarry management plan for the Project.

The mitigation strategies proposed form a fundamental part of this quarry project, as confirmed by Pepper J in *Friends of Tumblebee Incorporated v ATB Morton Pty Limited (No 2) [2016]* NSWLEC 66 (11 March 2016) at [78] referring to the established case law on this issue per *Newcastle & Hunter Valley Speleological Society Inc v Upper Hunter Shire Council and Stoneco Pty Limited [2010]* NSWLEC 48:

> *"78. Fourth, the description of the development the subject of a development application is not restricted to the nature, extent and other features of the development, but can also include measures that ameliorate or mitigate, prevent, remedy or offset the impacts of the development (Newcastle & Hunter Valley Speleological Society at [82]).This means that ameliorative measures not proposed as part of the development, but that are imposed later as conditions to the consent, are not able to be considered because the statutory inquiry is directed to the likely impact of the proposed development prior to, and not after, the determination of the application (Newcastle & Hunter Valley Speleological Society at [83] and the cases cited thereat)."*

Topography

The existing topography of the Project Site will be modified by the creation of an area for stockpiles and associated quarry infrastructure, with a benched extraction pit to the eastern side of this area. Acoustic bunding is proposed on land to the north and to the south of that part of the quarry dedicated to stockpiles and associated quarry infrastructure, even though not required in order to meet current noise requirements. All disturbed areas will be rehabilitated once extraction operations are completed.

Noise

The quarry site is well-positioned in terms of adequacy of setbacks from neighbouring residences, supplemented by various noise mitigation strategies. The quarry is well buffered by existing topographic barriers, the quarry operations shielded by the existing hill for much of the life of the quarry. The design of the layout of the quarry maximises the use of natural barriers-including the hill which contains the volcanic plug- and earthen bunds to mitigate noise.

A comprehensive noise impact assessment has been undertaken for the Project by VIPAC, Engineers & Scientists. The noise impact assessment, undertaken in accordance with the *NSW Industrial Noise Policy* (EPA 2000) and relevant Australian Standard, and NSW EPA *Road Noise Policy*, finds that with acoustic mounds in place the quarry is suitably buffered from all neighbouring residences (and almost all residences without any acoustic treatment). Moreover, the quarry development would comply with the EPA's recently adopted *Noise Policy for Industry* (EPA 2017) without the necessity for any acoustic mounding measures. Refer to **Appendix E**.

The noise impact on the Monaro Highway from the quarry operations is considered negligible due to the volumes of traffic that would travel on this route.

Blasting and Vibration

In terms of potential impacts associated with blasting, the quarry site is well-positioned in terms of adequacy of setbacks from neighbouring residences, supplemented by various noise mitigation strategies. A comprehensive blast and vibration impact assessment has been undertaken for the Project by VIPAC, Engineers & Scientists. The assessment finds that the quarry will generate acceptable blasting and vibration levels, in compliance with relevant criteria (generally recommended limits of 5 mm/s and 115 dB(L)), at the nearest rural residences for the life of the quarry. Refer to **Appendix F**.

It is proposed the predicted noise and blasting levels be verified through compliance monitoring. In the unlikely event that an exceedance is measured, control measures should be negotiated and agreed to by Schmidt Quarries and the affected land owners.

Air

The quarry project is well set back from nearest residential receivers. Activities on the quarry site will, however, from time to time generate dust and minor exhaust emissions and if not adequately controlled has the potential to be a nuisance. As a part of this EIS an air quality assessment was carried out to quantify and assess dust emissions and impacts likely to arise as a consequence of the proposed quarry project.

Preliminary dust modelling was undertaken as a part of this assessment, in order to quantify any potentially significant dust issues so that appropriate air quality controls could be built into the project design.

While dust impacts from quarry operations are not expected to be an issue, some mitigation measures are proposed in order to minimise the potential for impacts. As a result, the quarry project adopts an air quality management strategy aimed at protecting air quality of the locality and to minimise the likelihood of complaint.

An adequate on-site water supply forms one of the principal cornerstones for dust control at the quarry site, as well as positioning the operating plant and quarrying operations as far removed from neighbouring residences as possible. The dampening down of quarry working areas, including the quarry processing plant, other hardstand areas, active pit and internal haul roads, by water spraying, will also assist in ensuring that dust generation is satisfactorily reduced. Other dust reduction measures will include planting tree and shrub screens, coupled with the stabilisation and revegetation of topsoil and overburden stockpiles, as has been employed with success in the Applicant's Nimmitabel Quarry operations. Enforcing a 40 kph maximum speed limit on the internal quarry haul route will also assist in minimising dust generation.

A comprehensive air quality impact assessment has been undertaken for the Project by VIPAC, Engineers & Scientists, who find that the potential for dust generated by the quarry will be within acceptable environmental parameters. Refer to **Appendix G**.

Land Resources

The proposed quarry forms a part of a much larger rural holding of some 2,000ha. Other land owners within the locality includes a disused rail corridor owned by the state government (Transport for NSW), the road reserve either side of the Monaro Highway, and privately owned rural holdings surrounding the Project Site.

The Project Site is drained by a number of intermittent watercourses which lie within the catchment of the Snowy River and Murrumbidgee Rivers. The Project Site does not form a part of any drinking water supply catchment.

The Project Site has been previously cleared for the grazing of livestock. On site investigations reveal that the vegetation has been heavily modfied by past and ongoing agricultural activities.

The land has been identified as not being affected by any Council policy "*that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soil or any other risk (other than flooding)" (source: s.149 certificates obtained in May 2017 for the various lots making up the Project Site).* The land is flood free.

The soil cover on the quarry site, plant and access road will be retained and used for future rehabilitation works and drainage diversion banks. *Native* tussock grasses are to be replanted.

Sedimentation dams will be constructed within the working quarry area to ensure that stormwater flows are contained to within the working quarry area, which includes the processing area and quarry pit. Any disturbed areas will be planted out in order to contain the potential for erosion. These areas will be managed and repaired quickly as part of overall quarry site management procedures.

The assessment included a land use conflict risk assessment based on the Department of Primary Industries guideline "Living and Working in Rural Areas". The assessment included consideration of potential impacts from the operation of the quarry. The assessment reasonably identifies potential agricultural land use impacts as low. The method of revegetation of the overburden emplacement areas and bunds would be similar to that employed at Schmidt Quarries' Nimmitabel Quarry, having the following features:

- Establishment of initial vegetation cover using native grasses, with pine trees planted around the northern, eastern and southern perimeters of the quarry at project commencement.
- Implementing erosion and sedimentation control at the base of the all overburden emplacement areas and acoustic bunds.
- Grasses are planted for soil stabilisation purposes, while appropriate weed management practices are to be incorporated into the development.

Hydrology

The quarry site lies on generally undulating to moderately sloping ground, with one steeper section on a small part of the hill that is underlain by the volcanic plug. Drilling undertaken on the site reveals no incidence of groundwater below the quarry. There are no groundwater dependent ecosystems within the predicted area of influence and therefore the project will not impact on any such ecosystems.

The proposed quarry site does not lie within a floodplain and no permanent water bodies or watercourses traverse the Project Site. A centrepiece of the quarry erosion and sediment control plan is that runoff from all active quarry areas, including the stockpile and quarry processing plant areas, is contained within and drains to the quarry floor, within the active quarry void, or to the quarry infrastructure area. In these circumstances there is no discharge of any active quarry stormwater runoff to waterways, with no alteration to the hydrology of local (intermittent) watercourses either side of the saddle and the hill on which the quarry is to be sited. The overburden emplacement areas and acoustic mounds will be worked such that they drain back towards the active quarry area, and not drain off site. Various mitigation measures will be adopted to prevent increasing site runoff, groundwater contamination, unchecked erosion and sedimentation impacts, including the following:

- Stormwater runoff from active quarry areas (ie. 'dirty' water) is to be held in the quarry/quarry infrastructure area sediment basins and then re-used within the quarry and on the haul route for dust suppression purposes. The 'dirty' water management system is to be designed in accordance with the requirements *Managing Urban Stormwater: Soils and Construction* ("The Blue Book" Landcom 2004), and *Volumes 1 and 2E- Mines and Quarries* (DECC 2008) to manage forecast runoff.
- 'Clean' water is diverted away from areas of disturbance via constructed banks and works, thus minimising impacts on existing drainage areas outside of the active quarry area and to thus avoid contamination.
- Ongoing management and monitoring.

Refer also to **Appendix H.**

Heritage

A comprehensive Aboriginal archaeological and cultural heritage assessment was undertaken by consultants New South Wales Archaeology for the project in accordance with relevant guidelines and in consultation with representatives of the local Aboriginal community. The assessment finds that acceptable impacts should ensue. Refer also to **Appendix I.**

Traffic and Transport

Due to the nature of the proposed quarry operation, there will be traffic generated from haulage vehicles transporting the quarry product to customers in the surrounding region, as well as minor additional traffic from site employees. Product haulage will be along the internal quarry access road via a registered rail crossing within the site and thence to the Monaro Highway. The proposed internal haul route avoids running through residential areas. A driver code of conduct, addressing transport of materials to minimise traffic noise and improve traffic safety, is proposed. The haul route will cross over a defunct railway line prior to connecting with the highway. Upgrading of the highway intersection will be required in order to accommodate quarry truck traffic.Traffic impacts on the Monaro Highway itself will be minor and traffic conditions will continue to be satisfactory. Two options are considered: Option 1 allows for access to the highway near and existing access point; Option 2 follows a more direct route from the rail crossing to the highway, avoiding the habitat of a threatened lizard species. Refer also to **Appendix J**. The quarry site is remote from any source of vulnerable road user (pedestrians and cyclists) activity.

Waste

The Project will involve the minimisation of waste, and the maximisation of reuse and recycling of materials on site. The Applicant intends to ensure that wastes are managed appropriately, to minimise impacts on the environment. Measures proposed to reduced waste include the collection and storage of waste oil and grease in a bunded areas and removal by a licensed contractor, and the appropriate disposal of any on-site amenities effluent. All waste would be managed in accordance with the requirements of the *Waste Avoidance and Resource Recovery Act 2001*, the *Protection of the Environment Operations Act 1997*, and the OEH *Waste Classification Guidelines 2009*.

Hazards

The potential for contamination on the site has been assessed by consultants Geolyse, who find little potential for contamination of the site, thus satisfying the relevant precondition under SEPP 55 *per* Preston CJ *Moorebank Recyclers Pty Ltd v Benedict Industries Pty Ltd* [2015] NSWLEC 40. Refer also to **Appendix K**. Related to the above, the NSW Government's Heads of Asbestos Coordination Authorities (HACA) has published information on naturally occurring asbestos and have published maps of areas in New South Wales with a low, medium or high potential for naturally occurring asbestos to occur. The Project Site is mapped as an area with no potential for naturally occurring asbestos.

The Project Site is not mapped as comprising bush fire prone land. All workplace amenities, offices, workshops, vehicles, plant and storage facilities including those of contractors will have a suitable type and number of fire extinguishers available for use in the event of a fire. AS2444 provides details on the various extinguishers available, their use and effectiveness for various types of fire. All bulk storage of fuels, oils or other products will be in accordance with the relevant Australian standard. Signage will be located at all extinguisher locations on site to indicate the extinguisher type and suitability for the fuels, oils or other products stored on site. Flammable liquids are stored in a bunded area which is isolated from any vegetation. Fuel storage facilities should be located and designed to prevent potential fire hazards, as required by AS1940-1993- The Storage and Handling of Flammable and Combustible Liquids. There no dangerous goods proposed to be stored on site, and the only material likely to cause concern is diesel fuel. However, the site is not within close proximity to residencies and other land uses, and the diesel is to be stored in accordance with good quarry practice.

The Applicant undertakes to ensure that all persons working at the quarry are aware of their environmental and safety obligations and required procedures. The Applicant will have the responsibility of inducting each person in the relevant safety and quarry work procedures before commencing work at the quarry. Access to the site will be controlled to prevent public access, which is considered to adequately address any issues of public safety

Biodiversity

Parts of the Project Site have been identified as environmentally sensitive land associated with clause 6.3 Territorial Biodiversity in the Cooma-Monaro Local Environmental Plan 2013. The quarry development proposed accords with relevant provisions of the LEP in this regard by confining the project footprint and avoiding, wherever possible, habitats of value or relevance to threatened biota and biodiversity values generally, as well as through the implementation of the impact amelioration and environmental management measures in order to minimise and satisfactorily mitigate the impacts of the proposal.

According to a flora and fauna study undertaken by Gunninah Consultants a threatened lizard species has been found on the land in the lower areas of the project Site, near the rail line, to the east of the quarry pit, however, the proposed internal quarry haul route has been re-designed in order to avoid these habitats. The quarry itself is well clear of another known habitat of a threatened lizard, to the south. The ecological consultants Gunninah conclude that it is not "*likely*" that the proposed quarry development would impose a "*significant effect*" on any "*threatened species, populations or ecological communities, or their habitats*" pursuant to the relevant considerations in Section 5A of the EP&A Act. Similarly, Gunninah conclude that on the basis of the impact amelioration measures which have been incorporated into the project, that it is not likely that a "*significant impact*" would occur as a consequence of the proposal for the purposes of the Commonwealth Environment Protection & Biodiversity Conservation Act 1999 (EPBC) Act. Nevertheless, for the purpose of 'abundant caution', a 'Referral' of the Rock Flat Quarry project proposal has been made to the Commonwealth - pursuant to the EPBC Act. Refer also to **Appendix L**.

Visual

The existing and proposed quarry is visually obscured from most nearby dwellings and from the majority of the surrounding area by the combined effects of intervening topography and viewing distance. The visual assessment contained in this EIS concludes there would not be a significant impact on visual amenity as a result of the quarry proposal (Negligible to Low-Medium visual impacts).

The hill underlain by the volcanic plug containing the resource, is visible from sections of the Monaro Highway- in the main from some considerable distance, with glimpses of the site at closer quarters. Extraction operations will be undertaken behind the hill during the early phases of the project, with the hill gradually reducing in height until such time as a quarry pit is well established. Quarrying activities will be screened from view by the hill from the early phases of the quarry project, with landscaping and screening established around the perimeter of the quarry utilising a pine tree planting belt- similar to the visual mitigation measures as currently employed by Schmidt Quarries at their Nimmitabel Quarry operation. Pine trees are a common feature and a part of the cultural landscape of the Monaro Plain. A narrow corridor of land running parallel to and nearest the Monaro Highway is affected by clause 6.9 Scenic Protection Area in the Cooma-Monaro Local Environmental Plan 2013. No part of the active quarry or the majority of the internal quarry haul route is so affected by this LEP designation. Views of the knoll proposed to be quarried are visible in part from nearby Dwelling 1, with the peak of this knoll able to be viewed from Dwelling 5. No views of the quarry project will be visible from any other nearby residences. With construction of the earth berms and establishment of screen planting, residual visual effects would be limited from the majority of directions. Potential impacts on night-time scenic quality are not considered to be significant due to the hours of operation of the proposed quarry (day time only) and need for minimal security lighting only at night.

Social and Economic

The quarry operator, Schmidt Quarries, has a proven track record in responsible quarry management, and is established quarry operator serving the region for many decades. Their existing quarry, at Nimmitabel, is to shut down soon.

Schmidt Quarries seek to relocate their quarry operations to the Project Site, applying similar, proven and reliable quarry and environmental management measures to those currently applied at the Nimmitabel Quarry.

The proposed new quarry is an economic opportunity which does not conflict with recreation or tourism or agriculture or rural amenity or environmental values. The quarry operations are in a location with suitable setbacks and buffers to prevent adverse effects.The proposal would also have economic benefits via the provision of direct and indirect employment and contributions to the provision of much-needed quarry products to local industry and to the improvement of the local road infrastructure, including land subdivisions. The quarry will provide for ongoing employment of 12 staff staff currently employed at the nearby Nimmitabel quarry, generating wages of approximately $1.3 million. Maintaining this workforce and the continuing supply of valuable extractive industry resources from this locality would be a positive outcome for the local and regional economy.

The Project would provide major economic benefits in the form of annual operating income of between $4.5 million (at 150,000 tonnes per annum) and $8.4 million (at 280,000 tonnes per annum). If an output multiplier of 1.5 is used, the economic output of all other nearby industries within NSW would increase by between $6.75 million (at an average of 150,000 tonnes per annum) to $12.6 million (at maximum production of 280,000 tonnes per annum).Much of the operating expenditure is likely to occur within the local area and is likely to produce additional indirect effects to other local industries, potentially generating up to 24 more jobs locally.

Rehabilitation

The Project also includes active site rehabilitation and mitigation measures during the life of the quarry. Revegetated areas are to be carefully managed for a number of years after the initial rehabilitation works, with intensive management over the first few months. This is to promote rapid vegetation growth and development, and address any problems arising with vegetation establishment. (source: *Managing Urban Stormwater: Soils and Construction, Volume 2E Mines and Quarries* (DECC, 2008). The key components of the rehabilitation process proposed are as follows:

- Removal of all structures, equipment and other materials associated with quarrying from the existing works area, with appropriate erosion and sedimentation control measures.
- On completion of quarrying the site is to be rehabilitated to form a free draining and sustainable landform as consistent as possible with surrounding landforms. This is with the exception of the quarry pit, which will remain as a water storage area. Quarry faces will have a stable landform, to ensure safety.
- The rehabilitated landform to be covered with topsoil and other material and revegetated using native grass species, as and where nominated.
- The internal quarry access road to be retained for future (agricultural) uses.
- The acoustic bunds and perimeter planting areas are to be progressively rehabilitated from project establishment with pine trees and native grass species- the former treatment employed with success by the Applicant at the nearby Nimmitabel Quarry site.

Local, State Planning

The provisions of *State Environmental Planning Policy (Mining Petroleum and Extractive Industries) 2007*, *State Environmental Planning Policy (Infrastructure) 2007* and *Cooma-Monaro Local Environmental Plan 2013* permits the proposed development subject to development consent- the latter a permissible use in the RU 1 Primary Production zone. An Environmental Protection Licence (EPL) to undertake the scheduled activity will be required from the EPA under the *Protection of the Environment Operations Act, 1997*.

▪ Identification and Prioritisation of the Environmental Issues, Risks

The identification and prioritisation of the environmental issues associated with the proposed quarry has been based on a consideration of the following:

- The fact that the proposal seeks a modest quarry project subject to the provisions of strict environmental and other requirements.
- Outcomes of the consultation process with government agencies and others.
- Planning and environmental context.
- Specialist assessments undertaken as a part of the preparation of this EIS.

On this basis, the key environmental issues and potential risks have been identified and addressed in this EIS. Refer to accompanying Table 0.1.

Table 0.1: Summary of Quarry Project & Key Impacts/Issues

Issue	Potential environmental impact	Mitigation measures	Resultant environmental impact
Noise/ Blasting/ vibration assessment	Identified as an issue by the NSW EPA and Snowy Monaro Regional Council and in the issued SEARS. Potential for noise, blasting and vibration impacts at nearby residential receivers if unchecked and not managed in accordance with quarry 'best practice'	The quarry is well buffered by existing topographic barriers, the quarry operations shielded by the existing hill for much of the life of the quarry. Other mitigation measures include the placement of noise barriers around the crushing and screening plant- even though full compliance with 2017 EPA noise requirements without noise mounds. Monitoring of all blasting events is proposed	Modelling results by Vipac indicate that noise, blasting and vibration levels generated from quarry operations are predicted to comply with the noise criterion at all nearby residential receivers
Air quality impacts	Identified as an issue by the NSW EPA and Snowy Monaro Regional Council and in the issued SEARS. The potential for dust generation and air pollution, if unchecked and not managed in accordance with quarry 'best practice'	Dust control measures proposed, including regular watering of the internal haul route and quarry processing plant	The modelling by Vipac predicts compliance at all receivers
Water	Identified as an issue by DPI, DPI Water, OEH Snowy Monaro Regional Council, the NSW EPA and in the issued SEARS. Potential for water quality impacts arising from the development, if unchecked and not managed in accordance with quarry 'best practice'. DPI Water have identified the impacts on groundwater as an issue.	Stormwater runoff from active quarry areas (ie. 'dirty' water) is to be held in the quarry sediment basin system and then re-used within the quarry and on the haul route for dust suppression purposes. 'Clean' water to be diverted from the quarry site. Bunding for all fuel storage areas proposed	No significant water quality impacts arising from the development. All stormwater to be contained within the quarry. No impacts on nearby (intermittent) watercourses. The site of the quarry operation is located on elevated, flood-free land

Biodiversity	The impact of the proposed development on heritage values identified by OEH, Snowy Monaro Regional Council and in the issued SEARS.	The acoustic bunds are to be progressively rehabilitated with native tree and grass species, similar to the treatment employed by the Applicant at the nearby Nimmitabel Quarry site. Quarry haul route re-routed around habitat of threatened lizard	The land comprises grasslands. Gunninah Consulting found that with the mitigation measures proposed the development will not have a significant effect on threatened species or their habitats
Heritage	The impact of the proposed development on heritage values identified by OEH, and in the SEARS	General protocols adopted, should a site be found	New South Wales Archaeology undertook a detailed heritage assessment of the site. It found no sites
Traffic & transport	Traffic and road safety impacts was identified by Dept. Transport RMS and Snowy Monaro Regional Council (in particular regarding the disused rail line) and in the issued SEARS	A driver code of conduct, addressing transport of materials to minimise traffic noise and improve traffic safety, is proposed. Intersection with Monaro Highway to be upgraded	Acceptable traffic and road safety impacts. The proposed internal haul route crosses a registered rail crossing and has direct access to the Monaro Highway and has been designed to avoid threatened lizard habitat
Land resources	The potentiation for contamination was raised by the NSW EPA and in the issued SEARS. The potential for conflicts with agriculture was raised by the DPI	The method of revegetation of the overburden emplacement areas and acoustic bunds would be similar to that employed at the Applicant's Nimmitabel Quarry	No contamination potential. No likely conflict with agriculture- the quarrying activities proposed are sufficiently clear of, and do not conflict with, existing nearby agricultural activities
Waste	Identified as an issue raised by the NSW EPA and in the issued SEARS	Collection and storage of waste oil and grease in a bunded areas	Wastes are to be managed appropriately, to minimise impacts on the environment
Hazards, risk assessment	Identified in the SEARS issued by the Dept. Planning & Environment and NSW Rural Fire Service	No dangerous goods proposed to be stored on site. The land is not mapped as being bushfire prone, however, various bushfire mitigation measures are proposed	The Project Site is mapped as an area with no potential for naturally occurring asbestos. The Project Site is is not bush fire prone land.No dangerous goods proposed to be stored on site
Visual	The potential for visual impacts associated with the quarry identified in the SEARS issued by the Dept. Planning & Environment as well as by DPI and Snowy Monaro Regional Council	Landscaping and bunding/ mounding, together with natural topographic married, will ensure that visual impacts are acceptable	Acceptable visual impacts.Quarry operations to be screened from view during the life of the quarry operations- initially by the hill containing the volcanic plug, and once the hill is removed, by bunding and perimeter landscaping

Social and economic	Social and economic impacts were requested to be addressed in the SEARS issued by the Dept. Planning & Environment, as well as by DPI	The quarry operator has a proven tack record in responsible quarry management. Mitigation measures, similar to those used at Nimmitabel Quarry, are to be employed by the quarry operator, with additional, site-specific measures also proposed	The Applicant's existing quarry, at Nimmitabel, is to shut down soon. They seek to relocate their quarry operations to the Project Site, applying similar quarry and environmental management measures to those currently applied at the Nimmitabel Quarry
Rehabilitation	Rehabilitation raised in the SEARS issued by the Dept. Planning & Environment and Snowy Monaro Regional Council as an issue to address in the EIS	Quarry areas are to be carefully managed, with perimeter tree plantings and replantings of native grasses. Disturbed areas are to be landscaped during the life of the quarry	To rehabilitate the remaining disturbed area, a rehabilitation strategy has been developed, ensuring acceptable impacts
Local/state planning	The need to address the compliance of the quarry development with local and state government planning policies was identified as an issue in the SEARS issued by the Dept. Planning & Environment, Snowy Monaro Regional Council and DPI	Extractive industries are a permitted use in the RU1 zone. The proposed development is integrated development as it will require a licence under the Protection of the Environment Operations Act 1997	The Project complies with all relevant local and state planning policies and controls

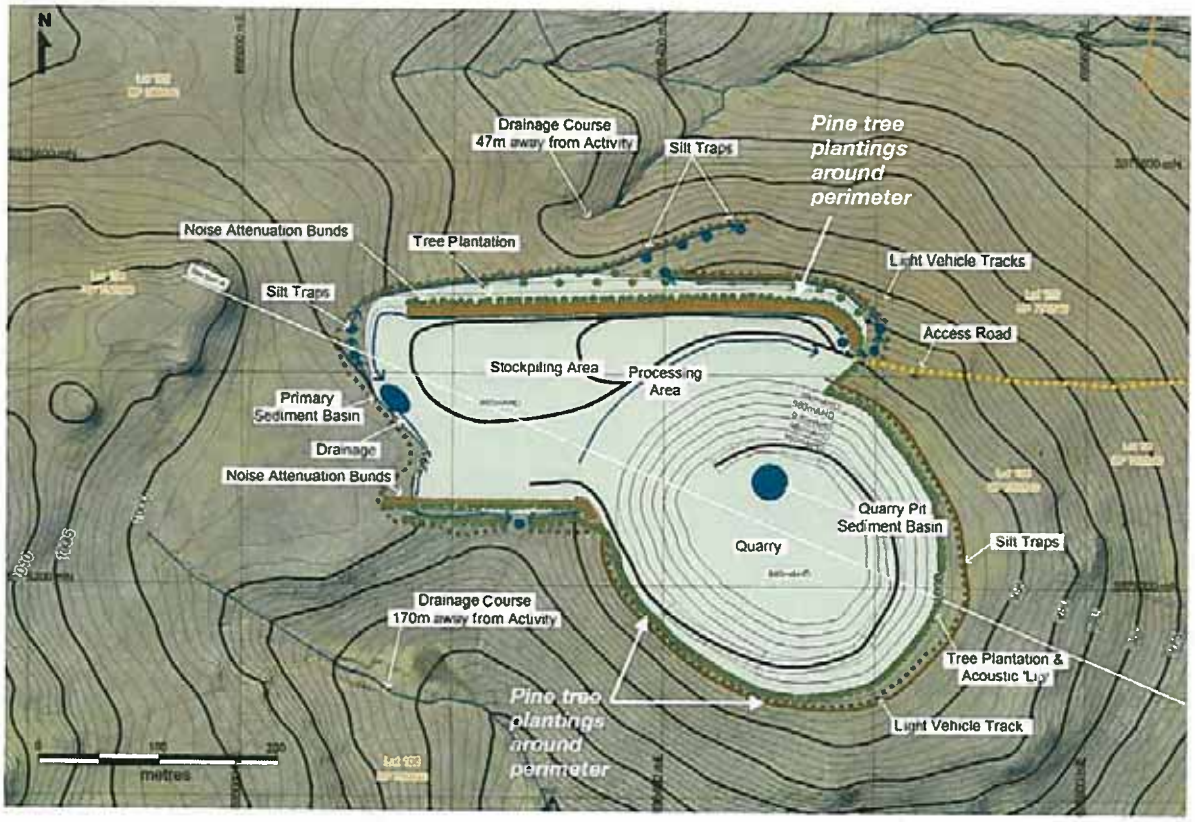


FIGURE 0.3: Detail of proposed quarry

(Map Base Source: Tanand)

1. Introduction

1.1 Need for Project

1.1.1 Overview

This Environmental Impact Statement (EIS) has been prepared by Outline Planning Consultants Pty Ltd to accompany a Development Application (DA) by the Applicant, SQ Licences Pty Ltd & Schmidt Quarries (the Applicant and quarry operator), for the establishment of a new quarry on a rural holding at Rock Flat, 14 km south of Cooma, on the NSW Southern Tablelands (the Project)- refer to accompanying Figure 1.1 and Figure 1.2.

The land which is the subject of the development application, proposed for a quarry and including an internal access route (the Project Site, or Site) lies within an area administered by Snowy Monaro Regional Council. It is proposed to create a quarry pit of approximate area 7.03ha with an additional 7.18ha approximately dedicated to quarry processing plant, overburden, stockpiles, revegetation areas, offices and other uses associated with the quarry. Access will be to the Monaro Highway via an internal quarry haul route approximately 2.267km long.[NOTE: Two highway access options are proposed: one in the vicinity of an existing access to the highway; the other directly in line with the existing registered rail crossing on the Project Site]. The Project is for a new 'green fields' quarry, to replace Schmidt Quarries' existing quarry operation at Nimmitabel, located some 12km to the south- a hard rock deposit which is nearly exhausted.

Soils are very shallow, with the quarry resource comprising a significant outcropping of a volcanic plug that extends to or near the natural ground surface. The site is located within a relatively remote rural area. It is situated within a rural environment, surrounded by a mix of grazing land and isolated rural dwellings. There are only three (3) rural dwellings within 2km of the proposed quarry- and only 2 dwellings not associated with the the quarry. The remoteness of the quarry site and distance from neighbouring dwellings acts to mitigate the impact of quarrying activities on the existing environment.

1.1.2 Site selection

The proposed new quarry seeks to extract rock from a volcanic plug, an artefact of past volcanic activity in the Monaro region. The quarry site meets many key environmental and operational requirements in terms of:

- Ease of access to a major road (Monaro Highway) and proximity to local markets.
- Relatively remote location in a sparsely populated rural area, well set back from existing rural residences.
- The proposed new quarry being visually concealed from neighbours and from the Monaro Highway.
- Small environmental footprint. The quarry contains a good sized resource over a relatively small area, set back from local watercourses (ie. maximum efficiency with least environmental disturbance).
- The Applicant's experience and good environmental track record in carrying out extraction operations from a similar, nearby volcanic plug resource. Schmidt Quarries' Nimmitabel quarry operation, some 12km to the south, is also a volcanic plug, similar to the one proposed to be worked at the Project Site.

The accompanying Table 1.1 summarises the initial site selection factors considered by the Applicant when choosing this Site for the proposed new quarry.

Table 1.1: Site selection factors considered

Site selection factor	Initial site selection assessment consideration
The extractive resource, soils	Drilling of the site determined the boundaries of the resource and to confirm the extent of the rock mass at depth. The tests and on site investigations by the Applicant reveal a good sized extractive resource, with the core of the hill comprising a volcanic plug surrounded by older deeply weathered material. The uniform nature of basalt plug found on the project Site is in contrast to the layered nature of the basalt flows which underlie much of the Monaro Plain- commonly only several metres deep and typically containing clays and other materials. The quality of the rock found in the volcanic plug, while probably not unique, is superior to materials contained in the surrounding basalt flows that make up most of the Monaro Plain. The Project Site appears to be stable, with no signs of any slippages or subsidence. The soils of the Project Site are not highly eroded, with little or no contamination potential. Addressed in detail in the contamination report accompanying this EIS
Operational requirements	The Site provides more than sufficient land area for future extraction requirements. The Project Site has direct vehicular access to the Monaro Highway and local/regional markets. It is understood that the Project Site may be provided with power in the near future
Topographic and meteorological conditions	The Project Site has meteorological conditions almost identical to that of the Nimmitabel Quarry, currently operated by the Applicant. The topography of the Project Site is similar to that of the nearby Nimmitabel Quarry- also a volcanic plug. This quarry has operated in accordance with all relevant environmental and planning controls imposed by the relevant consent and EPL conditions
Water conditions	The Project Site is located on an elevated undulating plain, with the volcanic plug found where there is a small hill. The quarry operations can be sited away from all nearby intermittent watercourses. There is no risk of flooding, given the elevated nature of the Site and local runoff conditions. All runoff from within the quarry is to diverted to the on-site detention basins. Water is then to be re-used within the quarry from these on-site stormwater detention basins. Addressed in detail in the EIS. Drilling reveals no groundwater within or surrounding the proposed quarry pit. The land is identified in the LEP as having potential groundwater vulnerability -refer to Groundwater Vulnerability Map Sheet CL_013. Addressed further in this EIS
Ecology	The land proposed for quarrying activities comprises land already cleared for agriculture, comprising native and 'improved' grassland, with no significant riparian vegetation stands. The land proposed for quarrying is not proximate to any environmentally sensitive areas like national parks, nature reserves, SEPP 14 wetlands. The land is identified in the LEP as being potentially environmentally sensitive- refer terrestrial Biodiversity Map Sheet BIO_013 in the LEP. Addressed in detail in the flora and fauna assessment report accompanying this EIS. The quarry haul route and quarry pit avoids the habitat of threatened lizards

Visual	The land proposed for quarrying and related activities is not identified in the LEP as comprising land with scenic protection designation- refer to Scenic Protection Map SCP_013 in the LEP
Heritage values	The land proposed for quarrying and related activities is not identified in the LEP as comprising land with heritage value- refer to Heritage Map HER_013 in the LEP. The site contains no known archaeological sites, confirmed by site survey
Transport	The Project Site has good access to the Monaro Highway. Two highway access options are proposed for consideration. Quarry truck traffic avoids direct contact with residential areas, hospitals, schools and commercial areas
Neighbourhood amenity	The land proposed for quarrying and related activities is well set back from and out of site from the nearest rural residences
Zoning	Extractive industries are a permissible use on the Project Site
Cumulative issues	There are no other (apparently) active extractive operations in the general vicinity of the project site. A temporary asphalt plant approved nearby, on Lot 2 DP 825408, also known as 30 Springs Road, Rock Flat, approved on 13 January 2015 (DA 10.2014.391.1), has since ceased operation. An extractive operation is located near the intersection of the highway and Springs Road but is believed to be no longer active

1.1.3 Environmentally Sensitive Areas

The investigations conducted as part of this EIS preparation process makes the following conclusions regarding the classification of 'environmentally sensitive areas' of State significance (as defined in *State Environmental Planning Policy (State and Regional Development) 2011*) has identified the following:

- The land the subject of this Development Application area is not within coastal waters of the State.
- No lands here are protected or preserved under *State Environmental Planning Policy No. 14 -Coastal Wetlands* or *State Environmental Planning Policy No. 26 - Littoral Rainforests*.
- No lands here are reserved as an aquatic reserve under the NSW *Fisheries Management Act, 1994* or as a marine park under the NSW *Marine Parks Act, 1997*.
- No lands here are within a wetland of international significance declared under the Ramsar Convention on Wetlands or lands within a World Heritage area declared under the World Heritage Convention.
- No part of the project the subject of this Development Application is located on land identified as being of high Aboriginal cultural significance or high biodiversity significance under the *Cooma Local Environmental Plan 2013* (LEP).
- No land here is reserved as a state conservation area under the *National Parks and Wildlife Act,1974*.
- No lands, places, buildings or structures listed on the State Heritage Register under the *Heritage Act, 1977* occur within the land the subject of this quarry Development Application.
- No land here is reserved or dedicated under the Crown Lands Act, 1989 for the preservation of flora, fauna, geological formations or for other environmental protection purposes occur within the land the subject of this quarry Development Application.
- No land here is declared as critical habitat under the NSW *Threatened Species Conservation Act,1995* or *Fisheries Management Act, 1994*.

1.2 EIS Requirements

1.2.1 Need for an EIS

The Project is an 'extractive industry', as defined. The quarry rock to be won from the site will be excavated from the ground, involving blasting. The quarry itself will be an open-pit from which the quarry resource will be extracted. Quarrying involves not only extraction of the quarry material (rock), but also involves crushing and screening that makes the rock suitable for eventual use as a construction or road-making or related material. As the quarry resource on the project Site is to be found at depth in the volcanic plug a series of benches will be created in order to gain access to the resource. An Environmental Impact Statement (EIS) is required for the extractive industry proposed on the Project Site pursuant to the provisions of clauses 16(1) and 19(1) of Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). This is because:

- The Project involves the crushing and grinding of more than 30,000 tonnes of quarry rock per annum - the Project proposing the crushing and grinding of up to 280,000 tonnes of quarry rock per annum.
- The Project involves the use of more than 2ha of land for quarrying and associated uses, including stockpiles, sediment basins and materials processing areas.
- A small part of the hill, containing the quarry resource, has a slope of in excess of 18 degrees to the horizontal.

The following are excerpts from the above clauses, with the triggers for this proposed development highlighted in bold:

"16 Crushing, grinding or separating works

(1) Crushing, grinding or separating works, being works that process materials (such as sand, gravel, rock or minerals) or materials for recycling or reuse (such as slag, road base, concrete, bricks, tiles, bituminous material, metal or timber) by crushing, grinding or separating into different sizes:

(a) ***that have an intended processing capacity of more than 150 tonnes per day or 30,000 tonnes per year,*** *or*

(b) that are located:

(i) within 40 metres of a natural waterbody or wetland, or

(ii) within 250 metres of a residential zone or dwelling not associated with the development."

"19 Extractive industries

(1) Extractive industries (being industries that obtain extractive materials by methods including excavating, dredging, tunnelling or quarrying or that store, stockpile or process extractive materials by methods including washing, crushing, sawing or separating):

(a) ***that obtain or process for sale, or reuse, more than 30,000 cubic metres of extractive material per year,*** *or*

(b) ***that disturb or will disturb a total surface area of more than 2 hectares of land*** *by:*

i) clearing or excavating, or

(ii) constructing dams, ponds, drains, roads or conveyors, or

(iii) storing or depositing overburden, extractive material or tailings, or

(c) that are located:

(i) in or within 40 metres of a natural waterbody, wetland or an environmentally sensitive area, or

(ii) within 200 metres of a coastline, or

(iii) in an area of contaminated soil or acid sulphate soil, or

(iv) ***on land that slopes at more than 18 degrees to the horizontal,*** *or*

(v) if involving blasting, within 1,000 metres of a residential zone or within 500 metres of a dwelling not associated with the development, or

(vi) within 500 metres of the site of another extractive industry that has operated during the last 5 years."

1.2.2 Secretary's EIS requirements

The general framework for an EIS is prescribed in Schedule 2 of the EP&A Regulation. The Secretary's Environmental Assessment Requirements (SEARS) provide specific matters to be addressed in an EIS, summarised in Table 1.2 below.

Table 1.2: Director-General's Requirements and where they are addressed in this EIS

Secretary's Environmental Assessment Requirements (SEARS) to be Addressed in this EIS		
Date of Issue EIS Specifications	20 March 2017 (EAR 1129)	
Date of Expiration	20 March 2019	
General Requirements	**Executive Summary** required in EIS.	Refer Executive Summary
	Description of the Proposal required in EIS including a full description of the quarry resource, previous quarrying operations, and details of the proposed quarrying	Section 2
	Conclusion required in EIS justifying the development on economic, social and environmental grounds, taking into consideration the objects of EP&A Act	Section 6
	Signed declaration required from the author of the EIS	Refer to front of EIS
Key Issues	**Noise**	Sections 2, 3 & 5
	Blasting & Vibration	Sections 2, 3 & 5
	Air	Sections 2, 3 & 5
	Water	Sections 2, 3, 4 & 5
	Biodiversity	Sections 2, 3, 4 & 5
	Heritage	Sections 2, 3, 4 & 5
	Traffic & transport	Sections 2, 3, 4 & 5
	Land resources	Sections 2, 4 & 5
	Waste	Sections 2, 3 & 5
	Hazards	Sections 2, 4 & 5
	Visual	Sections 4 & 5
	Social & economic	Sections 2,4 & 5
	Rehabilitation	Sections 2 & 5
Environmental Planning Instruments	The EIS to have regard for relevant environmental planning instruments including Cooma-Monaro Local Environmental Plan 2013 and any relevant development control plans/strategies	Section 3
EIS Quarry Guidelines	During preparation of EIS need to consult Department's EIS Guideline: *Extractive Industries – Quarries* and other relevant government guidelines	Guidelines consulted
Consultation	During the preparation of the EIS, need for consultation with and relevant local (ie.Snowy Monaro Regional Council) state, and Commonwealth authorities, service providers and community groups- in particular with surrounding landowners and occupiers	Section 1

The above key issues have been addressed in the EIS, supported by technical reports- refer Section 1.4 for further details.

The key issues relate to quarry management and mitigation measures generally, water resources, traffic and transport, biodiversity, and noise, vibration and blasting.

1.2.3 General EIS requirements

Within NSW, development approval and environmental assessment procedures are governed by the provisions of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). Part 4 of the EP&A Act provides the legislative requirements for proposals requiring development consent, including quarries (defined as "extractive industries"). The development proposal, involving 14.2ha of quarry area, including stockpiles and processing area, and a maximum extraction rate of 280,000 tonnes per annum constitutes designated development. The quarry is not State Significant Development for the purposes of *State Environmental Planning Policy* (SEPP) *(State and Regional Development) 2011*, as it involves: extraction of: less than 500,000 tonnes per annum; a resource of less than 5 million tonnes (4.6 million tonnes of resource proposed to be won from the Project Site); and not being within an environmentally sensitive area of State significance. In terms of triggering any of the other designated development provisions of the *EP&A Regulation* the quarry expansion proposal is:

- Not located in or within 40m of a natural waterbody, wetland or environmentally sensitive area. The site is well removed from any such features.
- Not located within 200m of a coastline. The site is well removed from the coastline.
- Not located in an area of contaminated or acid sulphate soil. The soils have no acid sulphate soils potential, with no previous use by uses likely to have caused contamination.
- Is located on land that slopes at more than 18 degrees to the horizontal (ie. 32% or 1:3.1 slope). The slopes on the quarry site are generally flat to undulating, however, a small part of the hill underlain by the volcanic plug has steeper land.
- Not located within 500m of a dwelling not associated with the development (the nearest dwelling is 1,690m away, to the west).
- Not located within 500m of the site of another extractive industry that has operated during the last 5 years. There are no such quarries in the near vicinity of the quarry site- the nearest quarry, near the intersection of Springs Road and the Monaro Highway, being more than 500m away from the proposed quarry.

Section 78A of the *EP&A Act* provides that a development application in respect of designated development must be accompanied by an environmental impact statement (EIS) prepared by or on behalf of the applicant in the form prescribed by the regulations. Clause 55 of the *EP&A Regulation* requires that an applicant responsible for preparing an EIS must consult with the Secretary of the NSW Department of Planning & Environment and have regard to the Secretary's requirements. This EIS has been prepared in accordance with the provisions of the *EP&A Act* and *EP&A Regulation*, and is in accordance with Secretary's Environmental Assessment Requirements (SEARS) dated 20 March 2017.

This EIS identifies and examines environmental impacts of the proposed quarry expansion and provides a means of addressing them so that the development can occur based on sound environmental management criteria already applied by Schmidt Quarries at their Nimmitabel quarry operations. All of the potentially significant impacts of the quarry on the environment have been investigated and analysed and, where appropriate, environmental management measures to mitigate any adverse impacts are detailed. The environmental management measures to be implemented in and around the proposed quarry, based on years of managing Schmidt Quarries' Nimmitabel quarry, means that impacts are understood, and can be appropriately mitigated and 'best practice' environmental safeguards implemented to adequately protect the environment during operation of the new quarry. Related to the above, the EIS is the principal source of information on which the public and the decision makers will rely on to assess the environmental impacts of the proposal.

1.3 Integrated Development Checklist

Under the provisions of the EP&A Act, approvals may need to be obtained from other Government agencies, in addition to obtaining a Development Consent. If a proposal does require approval from another government agency, it will be dealt with it as an "integrated development" application pursuant to s.91 of the EP&A Act. Relevant approvals required under the provisions of the integrated development provisions of the *EP&A Act* are summarised in Table 4.2 below.

Table 4.2: Integrated Development Checklist

Approval Authority	Law Requiring Approval	Applicability
NSW EPA, Dept Planning & Environment	ss.43(a), 47 & 55 *Protection of the Environment Operations Act 1997*	**Applicable**.An environment protection licence will be required once development consent is granted to the proposed quarry development
Office of Environment & Heritage, Dept Planning & Environment	Approval required under s.58 *Heritage Act* 1977	Not Applicable. No Heritage Order applies
Roads & Maritime Services, Dept Transport, Council	s.138 *Roads Act* 1993- works over or on public roads, including connection to a classified road	**Applicable**. RMS approval is required for proposed new access point with Monaro Highway.
National Parks and Wildlife Service NSW, Office of Environment & Heritage	s.90 of *National Parks & Wildlife Act 1974*	Not Applicable. No potential for Aboriginal sites being affected. Refer to archaeological report accompanying this EIS
NSW Fisheries, Dept of Primary Industries	Permits required under s. 144, 201, 205 and 219 of *Fisheries Management Act* 1994	Not Applicable. No marine impacts proposed as per the relevant sections of this Act
NSW Dept Industry	Approval to alter or to erect improvements under s.15 of *Mine Subsidence Compensation Act 1961*	Not Applicable
NSW Dept Industry	Grant of mining lease under ss. 63 & 64 *Mining Act 1992*	Not Applicable. No mining lease required
NSW Dept Industry	s. 9 *Petroleum (Onshore) Act 1991*	Not Applicable. No grant of a production lease is required for the proposed quarry development
Rural Fire Service (RFS), Ministry for Emergency Services	s.100B of the *Rural Fires Act* 1997	Not Applicable. The land is not designated as being either bushfire prone or within a bushfire buffer area. No s.100B authorisation required
Dept Primary Industries, Water	*Ss89,90 & 91 of Water Management Act* 2000	Not Applicable. License not required, given that development proposed lies outside of 40m of any 1st order stream that run through the Project Site. No groundwater impacts likely

NOTE TO TABLE 1.1: Section 91(3) of the EP&A Act provides that developments which also require consent under Section 138 of the *Roads Act 1993* are not integrated development if the council is both the development consent authority under the EP&A Act and the relevant Roads Authority providing consent under the Roads Act. In general, the Roads Act provides that a Local Council is the Roads Authority for all the roads within its Local Government Area except freeways. In this instance, as a Council is the relevant Roads Authority, the Development Application is not integrated development by virtue of this part of the *Roads Act 1993*. Where a development is integrated development, s.91A(3) of the EP&A Act gives the consent authority power under that Act to impose any conditions that an approval body could impose as a condition of its approval.

Even though there is a very wide power to impose conditions, the power of a determining authority to impose any condition nominated by the other government agencies is limited to only those conditions that fairly and reasonably relate to the proposed development and are for a purpose related to the relevant powers of that particular agency under the integrated development provisions of the EP&A Act.

1.4 Consultation

The SEARS include the need for consultation. Consultation with relevant stakeholders has occurred during the course of preparation of the EIS with affected landholders, government authorities, service providers, and other relevant stakeholders. Consultation with the following relevant government agencies and others has been undertaken during the preparation of the EIS, summarised in the accompanying table.

Table 1.2: Summary of Consultation with Government Agencies & Others

Government Agency	Date	Purpose
Snowy Monaro Regional Council	July 2017, meeting 18 October 2017	Heritage consultant contacted Council in July 2017. Development Management Unit Meeting held with Council officers on 18 October 2017, to discuss the Project. Schmidt Quarries has consulted with Council before this meeting and a number of meetings held
Department of Planning & Environment	March 2017	Request for SEARS for EIS. SEARS set out in advice dated 20 March 2017
Local Residents	November/ December 2017	Ongoing discussions/advice quarry operator with neighbouring local residents, including face-to-face meetings and subsequent distribution of a quarry facts sheet in November 2017 (refer to **Appendix D**), with following up discussions in November-December 2017. No objections received
Aboriginal Community	July-December 2017	Contact made with various Aboriginal organisations, to advise of the proposal
John Holland Group, on behalf of State Rail (Country Regional Network)	September - November 2017	Discussions/advice John Holland Group regarding quarry haul road truck traffic over the registered rail crossing on the Project Site. Approval granted
Heritage (OEH)	July-December 2017	Advice letter to OEH, National Native Title Tribunal, Merrimans Local Aboriginal Land Council (LALC), Office of the Registrar, Aboriginal Land Rights Act 1983, Native Title Services Corporation Limited (NTSCORP Limited) and Cooma Local Land Services in July 2017 advising of the proposal.In addition, an advertisement was placed with the local paper (Cooma-Monaro Express) and appeared in the 23 August 2017 edition. Relevant parties for the area sent correspondence dated 23 August 2017. Responses received following the above. Seven (7) Registered Aboriginal Parties consulted for the project.The archaeological survey undertaken by Andrew Pearce, NSW Archaeology Pty Ltd, and Eric Naylor, Sites Officer, Merrimans LALC

1.5 EIS Project Team

The preparation of this EIS on behalf of SQ Licences Pty Ltd was undertaken and managed by Mr Gary Peacock BTP (UNSW), principal of Outline Planning Consultants Pty Ltd. Outline Planning Consultants Pty Ltd has relied upon the adequacy and accuracy of the assessments and advice contained in the following reports, plans, and other information prepared by the following specialist consultant teams provided below, and should be read in conjunction with the following table.

Table 1.5: EIS Project Team

Specialist area of expertise	Name of consulting firm	Names of specialist personnel
Ecological assessment	Gunninah Consultants	Dominic Fanning, Principal Derek Engel, Lesryk Steve Bloomfield, Lesryk
Noise, vibration and blasting	Vipac	Brian Mendieta, Engineer (Acoustics) Darren Van West, Engineer (Acoustics)
Air quality assessment	Vipac	Stephen Thomas, Principal Air Quality Scientist
Aboriginal heritage	New South Wales Archaeology	Julie Dibden, Principal
Roads and traffic assessment	Streetwise	Craig Nethery, Traffic Consultant & director Andy Davis, Traffic Consultant & director
Contamination assessment	Geolyse Pty Ltd	Brendan Stuart, Environmental Scientist Martin Haege, Environmental Engineer
Water assessment	Geolyse Pty Ltd	Martin Haege, Environmental Engineer Brendan Stuart, Environmental Scientist Alistair Whittle, Civil eEngineer

On behalf of Schmidt Quarries, the quarry operator and director of the firm Mr David Schmidt provided technical information on the proposal and undertook community consultation with surrounding neighbours- with no objections received. The remaining parts of the EIS were completed by Outline Planning Consultants.

1.6 EIS Report Structure

The purpose of this EIS is to enable consideration of the implications of the Project and to seek approval for the new hard rock quarry. The EIS has been prepared in accordance with the EP&A Act and the EP&A Regulation. An overview of the layout of this EIS is provided below:

- The **Executive Summary** provides a brief overview of the proposed Project and the EIS.
- **Section 1.** introduces the Project, provides a brief overview of the quarry history and existing operations, a summary of EIS requirements for the Project, consultation, and the EIS Project team and EIS report structure.
- **Section 2.** contains a detailed description of the Project, including quarry management and mitigation measures proposed, along with alternatives to the Project.
- **Section 3.** contains a description of the existing environment.
- **Section 4.** outlines the planning and environmental context for the Project, including the applicability of Commonwealth and state legislation.
- **Section 5.** contains an assessment of the key environmental issues and impacts relevant to the Project.
- **Section 6.** contains a conclusion for the Project.
- **Section 7.** contains a a list of references referred to in the EIS.
- **Section 8.** provides a list of abbreviations and a glossary of technical terms.

The appendices to the EIS present the following additional information including:

- A copy of the Applicant's Development Application (**Appendix A**).
- The Secretary's Environmental Assessment Requirements (**Appendix B**).
- Petrographic analysis of drilled rock samples by Geochempet Services (**Appendix C**).
- The Fact Sheet distributed by Schmidt Quarries to local residents (**Appendix D**).
- Reports compiled by a team of specialist consultants who have undertaken specific assessments of the Proposal. The results of each specialist consultant's report are summarised into the appropriate section(s) of the EIS- refer **Appendices E-L**.

2. Proposed Quarry Operations

2.1 Overview

2.1.1 The Applicant

The applicant is SQ Licences Pty Ltd and Schmidt Quarries, based at Queanbeyan, who currently lease the Project Site from the landowner. Schmidt Quarries currently employs a total of 12 staff at their nearby Nimmitabel Quarry operations, and multiple sub-contractors, including local trucking contractors. Schmidt Quarries has operated in the region for many decades. It also currently operates quarries from the following locations:

- Nimmitabel quarry operation- also working a volcanic plug, similar to that at the Project Site.
- Nerriga basalt quarry (Outline Planning Consultants Pty Ltd having prepared the EIS for this quarry).
- Braidwoood quarry.
- Murrumbateman hard rock quarry, located about 50km to the north of central Canberra.

Schmidt Quarries also operates a concrete plant at Kalaru, near Bega, serving the Far South Coast of NSW. The firm is committed to continue the development and operation of the proposed quarry in a manner that achieves environmentally responsible outcomes, without detriment to the local community and the environment generally.

The quarry management measures applied by Schmidt Quarries at their Nimmitabel quarry operations will be equally applicable to the development of the proposed quarry on the Project Site- the extractive resource at both sites comprising volcanic plugs.

2.1.2 Project and Management Overview

The following outlines the management measures applicable to the proposed quarry and its operation. The proposed development includes ameliorative measures. These measures will be similar to- but not the same as- those applying at Schmidt Quarries' current quarry operation at Nimmitabel. The key objectives of the proposed quarry expansion (ie. the Project) are as follows:

- Allow production of up to 100,000 cubic metres (approx. 280,000 tonnes) per annum of quarry product - the same level of production as at the Nimmitabel quarry site. It is proposed that the quarry will produce a range of products for distribution in the Snowy-Monaro and South Coast region including aggregates for concrete, asphaltic concrete or bitumen sealing and crushed rock materials for road pavement construction purposes.
- To enable extraction from the volcanic plug. The proposed quarry pit area will have an area of 7.03ha approximately, with the adjoining section of the quarry, devoted to allied uses including stockpiles, workshops and sediment dams having an area of 6.18ha approximately, with an additional 1.0ha devoted to works associated with the construction of bunds and replanting areas.
- Approval for a quarry resource of approximately 4.6 million tonnes. At an average production of 150,000 tonnes per annum the quarry would have an effective life of about 30 years.
- To ensure that noise, blasting, water, land resources, visual and traffic impacts are managed appropriately.
- To carry out quarrying operations on site during the hours of 6.00am to 6.00pm Monday to Friday and 7.00am to 2.00pm on Saturdays, excluding Sundays and public holidays.

In summary, it is proposed to locate the quarry on the crest of a small hill located in an elevated upland area forming a part of the Monaro Plain, extraction of the hill being limited to between about RL 1,000m AHD and the peak of the hill at about at an elevation of about RL1,035m AHD- a reduction in height of about 35m above the surrounding upland area/ridge. It is proposed to construct a crushing and screening plant on the mid-slopes of the hill immediately to the north and to the west of the proposed quarry pit, behind the existing knoll. It is also proposed to construct a new internal quarry access route, linking the proposed quarry back to a new intersection with the Monaro Highway, some 850m to the east of the quarry.

The accompanying Table 2.1 provides a summary of the key components of the Project.

Table 2.1: Summary Proposed Quarry

Project component	Details of proposed quarry
Quarry Footprint	14.21ha. Includes quarry pit (7.03ha), stockpiles and quarry processing area (6.18ha) and acoustic bunds and new plantings proposed around the perimeter of the quarry (1.0ha)
Production Limit	Maximum of 100,000 cubic metres pa (280,000 tonnes pa approx.)
Hours of Operation	6.00 am and 6.00 pm Monday to Friday and 7.00am to 2.00pm Saturdays
Quarry Operations and Layout	Site works, followed by blasting, transport of material to crushing and processing plant, transport of finished product off site.The quarry incorporates extraction area, a processing & crushing plant area and two sediment basins
Quarry Haul Route	From the quarry site, along internal quarry haul route and thence to Monaro Highway via a (registered) crossing over a disused rail line. The overburden and waste rock won from the initial stage of the quarry will be used to construct the haul route, with regular upgrades using the same or similar quarry products
Blasting Hours	9.00 am and 3.00 pm Monday to Friday
Vegetation	Clearing to be confined to the removal of grassland only. New plantings proposed around the perimeter of the quarry at commencement, to soften the visual impact
Water	Two sediment basins are proposed: one serving quarry infrastructure (mainly devoted to crushing plant and stockpiles but to incorporate future uses including offices, facilities and workshops post-establishment); the other serving the quarry pit
Quarry Process	In summary, the approved quarrying process at quarry generally consists of the following different phases: clearing of land ahead of blasting of rock; drilling & explosive charge is fired at the worked quarry face; loose rock is then crushed and screened, before being transported off site via internal quarry haul route and Monaro Highway entry/exit point; rehabilitation of the final worked quarry area/quarry benches
Stormwater Management	To contain runoff, all stormwater in the quarry floor and active quarry areas is directed to the sediment basin located in the base of the quarry. Within the stockpile and crushing plant area all stormwater to be directed to an additional sediment basin
Dust Control	Water tanker to be used to suppress dust on site. Water sprays used on select product stockpiles. Water to be derived from within quarry
Noise	Acoustic bunds to be constructed on the northern snd southern sides of the crushing plant and stockpile area. Quarry to be also acoustically shielded by existing hill (containing the resource) for early parts of the operation of the quarry with 'lip' provided around the eastern side of the quarry

The proposed quarry area comprises land which is cleared, the site of the quarry pit generally characterised by at or near surface rock. Refer to photograph at the end of section 3 of this EIS. The floor level of the quarry will be to extend to as low as RL940m, approximately 60m below the level of the adjoining ridge.

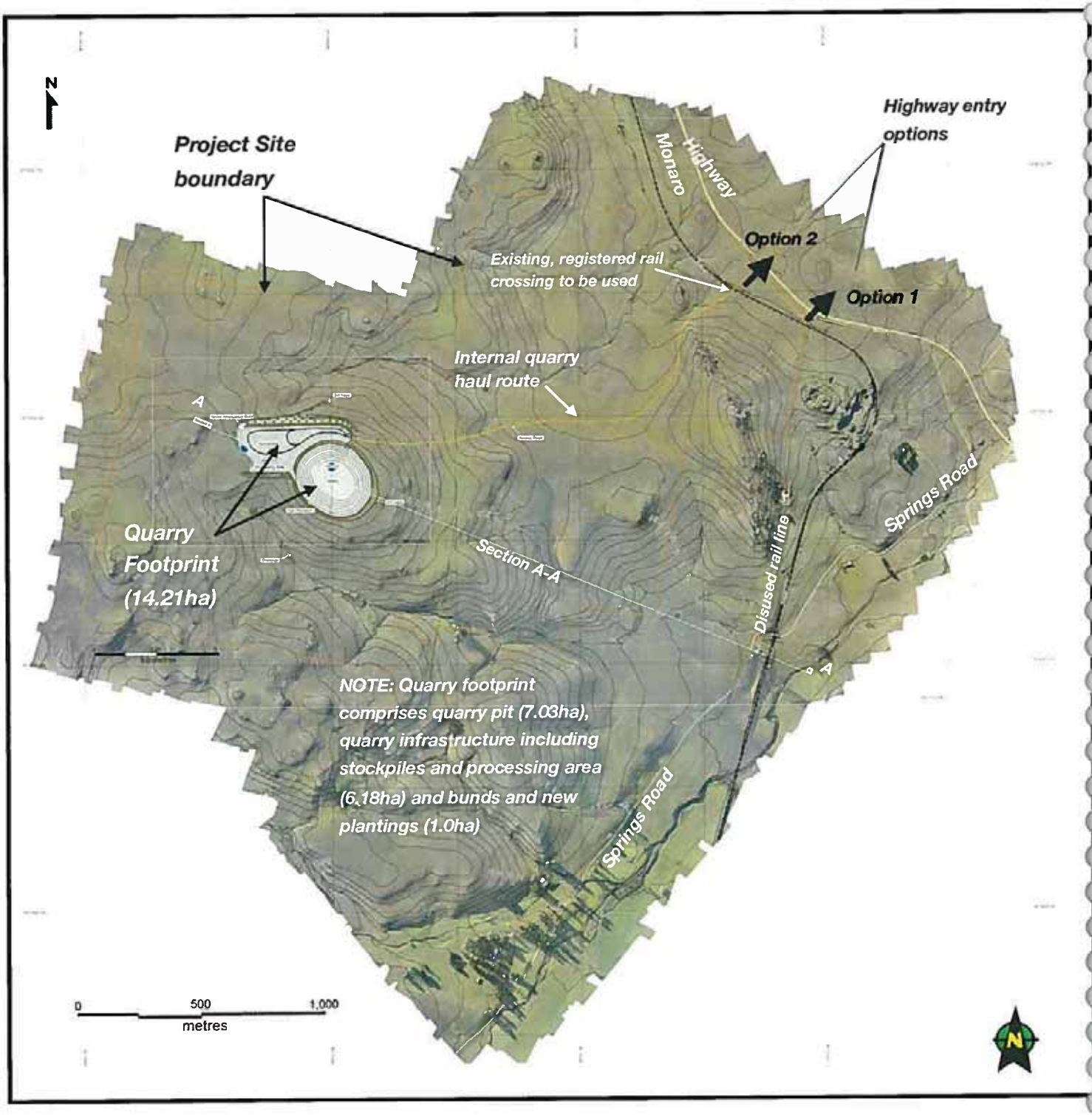


FIGURE 2.1: The Project Site, including proposed quarry and internal quarry haul route, and surrounding Rock Flat locality

(Map Base Source: Tanand)

2.1.2 Phasing of Quarry Operations

The proposed quarry operation will be phased in accordance with the following broad characteristics:

- **Initial phase:** Extractive material will be won from the rear (north-west) side of the hill, progressively lowering the rear profile of the hill, with extraction to then proceed in a generally south-easterly direction. This method of extraction will ensure that the quarrying operations are shielded from view from the nearest residences to the south-east, in particular. The overburden and rock won from the quarry site during this initial phase will be used for the construction of the internal haul route from the active quarry area back to the proposed intersection with the Monaro Highway, as well as establishment of working pads for the processing plant and stockpile area on the quarry and bunding along the northern and southern side of the processing plant/stockpile area. Any water required during this phase will be imported from Schmidt Quarries' Nimmitabel quarry pit, which has large reserves of stored water. The applicant intends to plant screening trees around the quarry and processing plant area, including product stockpiles, to be established on bunds. This will ensure that from an early stage there are plantings in place to further soften the ongoing visual impact of disturbance to these elevated areas. This land set aside for processing plant area will be progressively expanded over time as increasing amounts of quarry by-product- principally crusher dust- is produced.

- **Commencement of active quarry phase:** Extractive material will continue to be won from the rear (north-west) side of the hill progressively lowering the profile of the hill until RL 1000m AHD, after which quarrying of a pit will occur. During the life of the quarry infrastructure including weigh bridges, offices and facilities, workshops, hardstands and allied uses will be established within the area to be used for the crushing plant and stockpiles. Extractive material will continue to be won from the rear (north-west) side of the hill, with progressive enlargement of the processing plant and stockpile areas, the material to be supplied by the quarry. Plantings of screening vegetation around the quarry and processing plant area will become more established over time.

- **Decommissioning of quarry phase:** At the end of extraction activities the site will be decommissioned and rehabilitated, ensuring that all disturbed areas and excavated quarry pit slopes are left in a stable condition. This phase will also entail removing all plant and equipment, buildings, structures and foundations, and retention of any water storage basins and the internal haul route for use for future agricultural purposes.

Refer **Figures 2.2** to **2.4**.

NOTE: this application is NOT a staged development application pursuant to the provisions of Section 83B of the EP&A Act] All of the quarry phasing indicated above are indicative only and quarry operations may vary due to operational or other requirements. It is not to be strictly relied upon for the purposes of any future compliance assessment. The above quarry pit configurations have been used for the purposes of environmental assessment only. Similarly, the life of the quarry cannot be accurately predicted, given the major fluctuations in demand for quarry product from year to year. In all probability, it is likely that the life of the quarry will be of the order of 30 years. However, the effective life of the quarry will be extended proportionately if lower levels of annual production are achieved.

The quarrying proposed here is a 'top-down' process which requires preparatory site works immediately ahead of working the quarry. The quarry resource can be recovered with comparative ease. Overburden and topsoil will be used in bunded areas around the quarry pit, to divert runoff from areas upslope and for the purposes of establishing vegetative screening plantings.

The disposition of quarry activities on the site, including infrastructure such as office, stockpiles, processing area and sediment basin, will be subject to continual change as quarrying expands progressively downward, however, these activities will remain within the proposed ultimate quarry footprint area as illustrated.

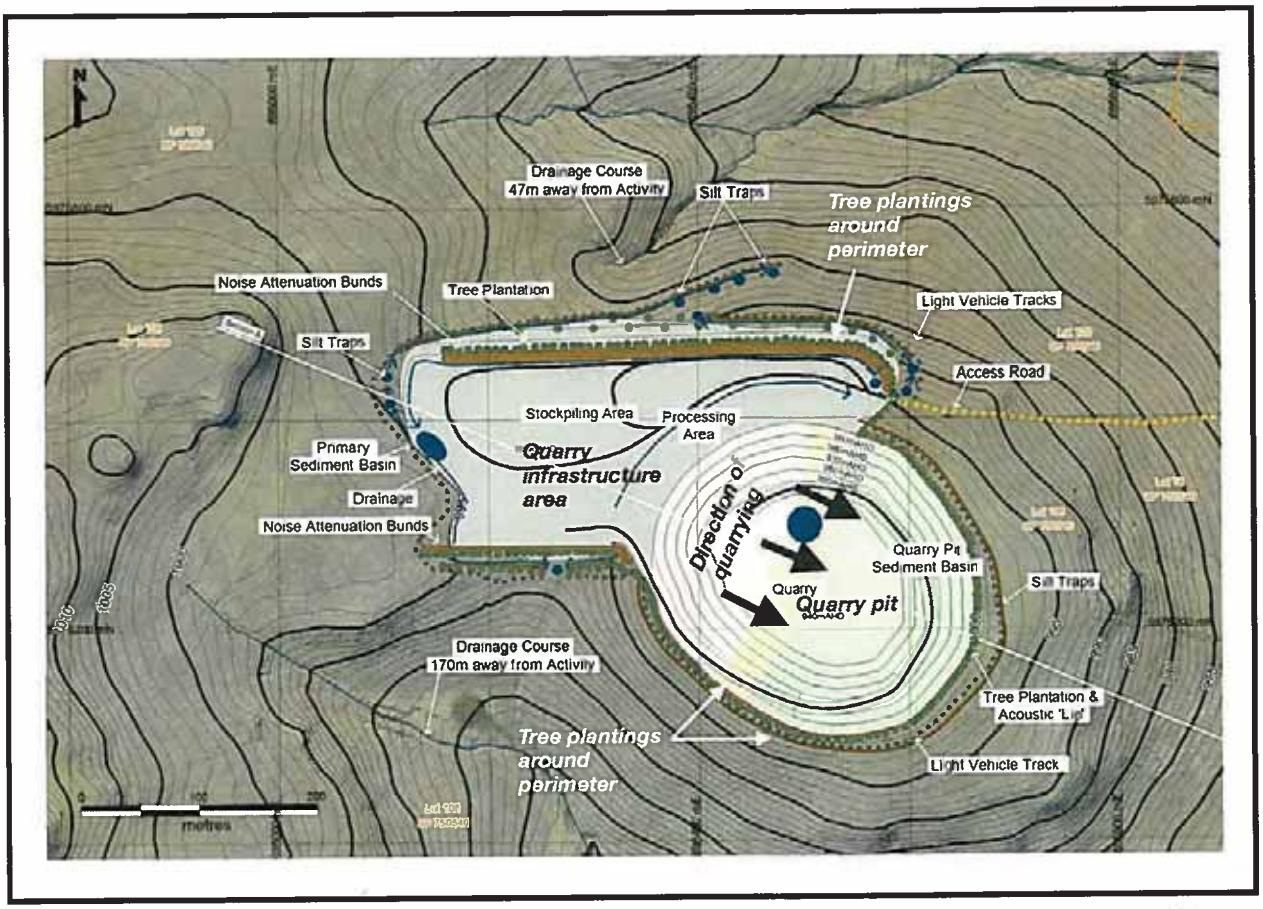


FIGURE 2.2: Proposed quarry and indicative phasing of quarrying - refer Figure 2.3 for key to indicative stages *(Source: Tanand 2017)*

2.2 Quarry Products

2.2.1 The Quarry Resource

The elevated hill/knoll on which the proposed quarry is located, is considered to be an artefact of volcanic activity in the Monaro region, comprising a remnant volcanic plug surrounded by older deeply weathered rocks of volcanic and sedimentary origin. Drilling by Schmidt Quarries to determine the general boundary of the basalt, augmented by visual inspection, has confirmed the extent of the volcanic resource at depth. A bulk sample of the rock was taken from the site and crushed to provide material for testing. The results of chemical and mechanical tests show that the rock is a premium grade material with good physical and chemical characteristics. The detailed petrographic examination of drill chip samples by Geochempet Services dated 30 January 2017 (**Appendix C**) shows the rock to be an Olivine Basalt with the following characteristics:

- Olivine basalt, a basic volcanic rock moderately durable to durable.
- Finely holocrystalline (volcanic rocks in which mineral grains can be recognised with the unaided eye), non-porous rock.
- Unweathered to slightly weathered rock.
- Moderately hard to hard, moderately strong to strong.
- Nil free silica content.

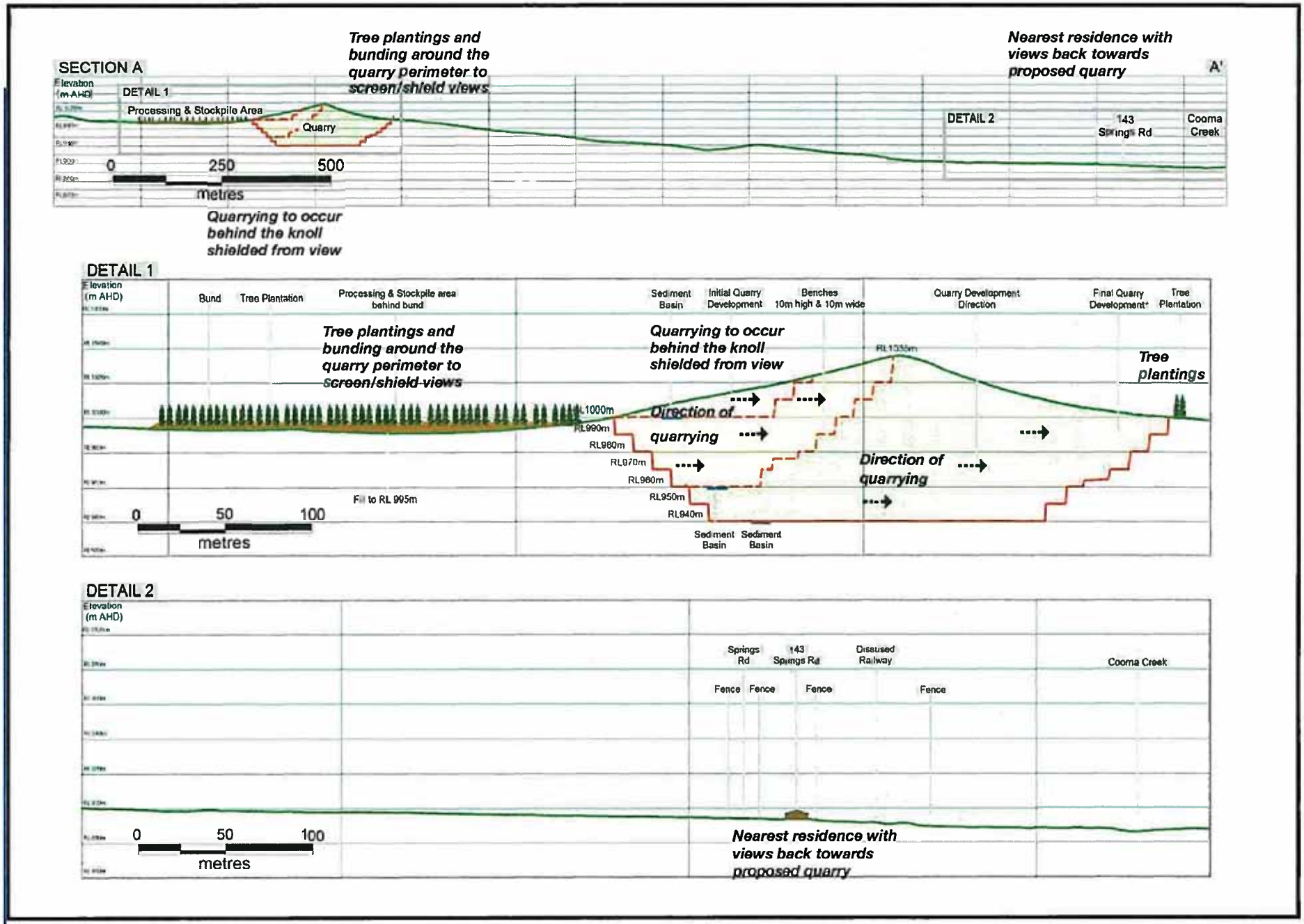


FIGURE 2.3: Section A-A from nearest dwelling to proposed quarry & indicative staging of quarry

(Source: Tanand 2017)

The uniform character of the basalt plug is in contrast to the typically layered nature of the basalt flows which underlie much of the Cooma-Monaro region.

In the geological past this plug was probably one of a number of vents that were the source of basalt for the flows on the Monaro. The basalt flows in the region are commonly only several metres thick and many flows are separated by alluvial and residual clay soil layers. It has also been noted that at least some flows contain a range of secondary clay minerals and vesicles (small cavity in a volcanic rock that was formed by the expansion of a bubble of gas that was trapped inside the lava) of variable size. Accordingly, although the volcanic plug is probably not unique, the quality of the rock it contains is superior to materials contained in the surrounding basalt flows.

2.2.2 Quarry Products

It is proposed that the quarry will produce up to 100,000 cubic metres of product per annum, equivalent to approximately 280,000 tonnes per annum. The extractive materials won from the quarry are clean, strong, durable and of a suitable shape, density, strength, porosity and permeability capable of meeting the technical specifications or standards set by Standards Australia, NSW Roads and Maritime Services and other authorities, such as NSW State Rail.

The quarry products to be won and supplied from the new quarry will be similar to those that have been produced in the recent past from the applicant's quarry at Nimmitabel, having a wide range of application in road building, construction, landscaping and infrastructure projects generally, including but not limited to the following:

- Road base (DGB20 base, DGS20 and DGB20), used as road construction material.
- >26mm non-specification road base: used in the construction of roads, specifically as sub-grade road base material, also for drainage and erosion control, ballast, mattress and gabion.
- High quality aggregates (5mm to 20mm). Aggregates used for surfacing of roads, asphalt, concrete, landscaping and road construction generally. This includes the supply of pre-coated sealing aggregate from the quarry.
- <5mm quarry fines: used for blending to produce soil landscaping products.
- Stabilised road bases: consisting of 20mm road base material with the addition of a chemical additive to increase the strength of the product.
- Pre-coated 7mm, 10mm and 14mm aggregates: used in RMS/local council road sealing programs (for spray seal applications). Includes hard rock further treated by coating with bituminous emulsion for use in hot mix or asphalt application.

Recently, the Nimmitabel quarry provided hundreds of thousands of tonnes of processed quarry rock for hardstand areas associated with 67 wind turbines for the Boco Rock Wind Farm, located 10km to the south west of Nimmitabel.

2.2.3 Market for Quarry Products

The quarry will serve markets within a wide range of the quarry- refer **Figure 4.9** for extent. The market for quarry products will be the same as for the existing Nimmitabel quarry, namely, the Monaro region and NSW South Coast. Currently about 60% of production from the Nimmitabel quarry serves the NSW South Coast, with about 40% serving the Monaro region.

2.3 The Project & Proposed Quarry Management

2.3.1 The quarry process

Further to the overview of quarry operations proposed in section 2.1 of this EIS, the key steps in the quarrying process on the Project Site consists of the following:

- **Initial site works:** Removal of surface rock , topsoil and overburden overlaying the volcanic rock suitable for extraction. Extraction will commence at the top of the small hill and will be undertaken thereafter behind the hill, shielding the proposed extraction operations from view. Material won from the quarry at establishment will be used to construct the internal haul route back to the Monaro Highway and in the establishment of initial hardstand working pads for the quarry processing plant and stockpiles, drainage and bunding. Equipment to be used during site establishment activities would include a bulldozer, excavator and grader. A perimeter planting of pine trees will commence at this stage of the quarry operation.

- **Drilling and blasting of rock:** Drilling and blasting will be carried out in accordance with relevant EPA blasting requirements. Blasting is proposed to occur between the hours of 9.00 am and 3.00 pm Monday to Friday. The rock won from blasting (shot rock) will then be transported on site back to the quarry processing plant for crushing snd screening.

- **Loading of blasted rock and transfer to crushing plant:** After the rock is broken into smaller pieces as a result of blasting operations, the rock is then loaded (typically by excavator) into a dump trucks which transfer the broken hard rock (primary raw feed) to the quarry's primary crusher. This material is then fed into the primary crusher for crushing and screening to produce quarry product. Loading and haulage of primary raw feed from the quarry to the primary crusher is proposed between 7.00 am and 6.00 pm Monday to Friday and 7.00am to 7.00pm on each Saturday.

- **Crushing, screening and stockpiling of quarry product:** The crushing and screening process involves passing the raw feed material rock through a series of crushers to produce quarry products of various sizes and shapes to meet customer specifications. A series of screens and conveyors are used to sort the crushed rock into various size categories, described in 2.2 above. Fines and other by-product material removed from the crushing process will be stockpiled for re-use on site, or sold for other purposes such as road base material. It is proposed that the crushing and screening plant will be mobile and will follow the working quarry face. However, there may be a requirement to relocate or upgrade existing crushers, or add crushers as throughput or demand for material warrants. These products are then loaded into trucks for sale and transported off site.

Quarrying will involve the drilling and blasting of hard rock to establish the quarry benches and enable extraction of basalt rock at depth. At establishment, drilling is at the surface. Once the quarry achieves a suitable depth, drill rigs will work the benches of the pit. This drilling and blasting approach develops the typical 'stepped' quarry profile. This profile enables the digging from one bench whilst other parts of the quarry can be prepared for recovery of the basalt resource. Holes will be drilled prior to blasting the rock to a size suitable for crushing in the primary jaw crusher. Blasted rock will be retrieved from the pit face and either loaded directly into the mobile crusher by front-end loaders or trucks. Water carts will be used within trafficked areas in within the quarry site in order to suppress dust nuisance. Any larger rock fragments will be stockpiled within the approved quarry area for later use and/or treatment.

The quarry will be undertaken using benches of maximum height 15m, with each bench being typically of a width of 6m. A berm/bund will be constructed around the perimeter of the quarry, diverting stormwater flows back to within the working quarry area. This bund system will be extended further as the quarry footprint is progressively enlarged.

PHOTOGRAPH: Nimmitabel quarry, like the Project Site, is also a volcanic plug

(Source: Schmidt Quarries Nimmitabel quarry October 2017)

The key components of the proposed quarry include the following. Refer also to **Figure 2.4**.

- A quarry pit providing a volcanic hard rock resource.
- Crushing and screening plant and associated product stockpiles.
- Trucks loading material and transporting product from the existing worked quarry area to the intersection of the internal quarry haul route and the Monaro Highway.
- Construction of internal road and other works, including construction of a berm around the perimeter of the quarry in order to contain stormwater flows to within the quarry and into quarry the sediment basin(s).
- Earthworks and clearing of grassland vegetation.
- Carry out blasting and processing of quarry rock on site.
- Establishment of sedimentation and erosion control measures.
- Other infrastructure such as parking areas and loading areas for trucks and machinery, future quarry office, fuel storage areas, workshop, pre-coat storage, water supply basin and the like. Initially, all plant is to be run by mobile generators, as the quarry site is not currently connected to the local power network.

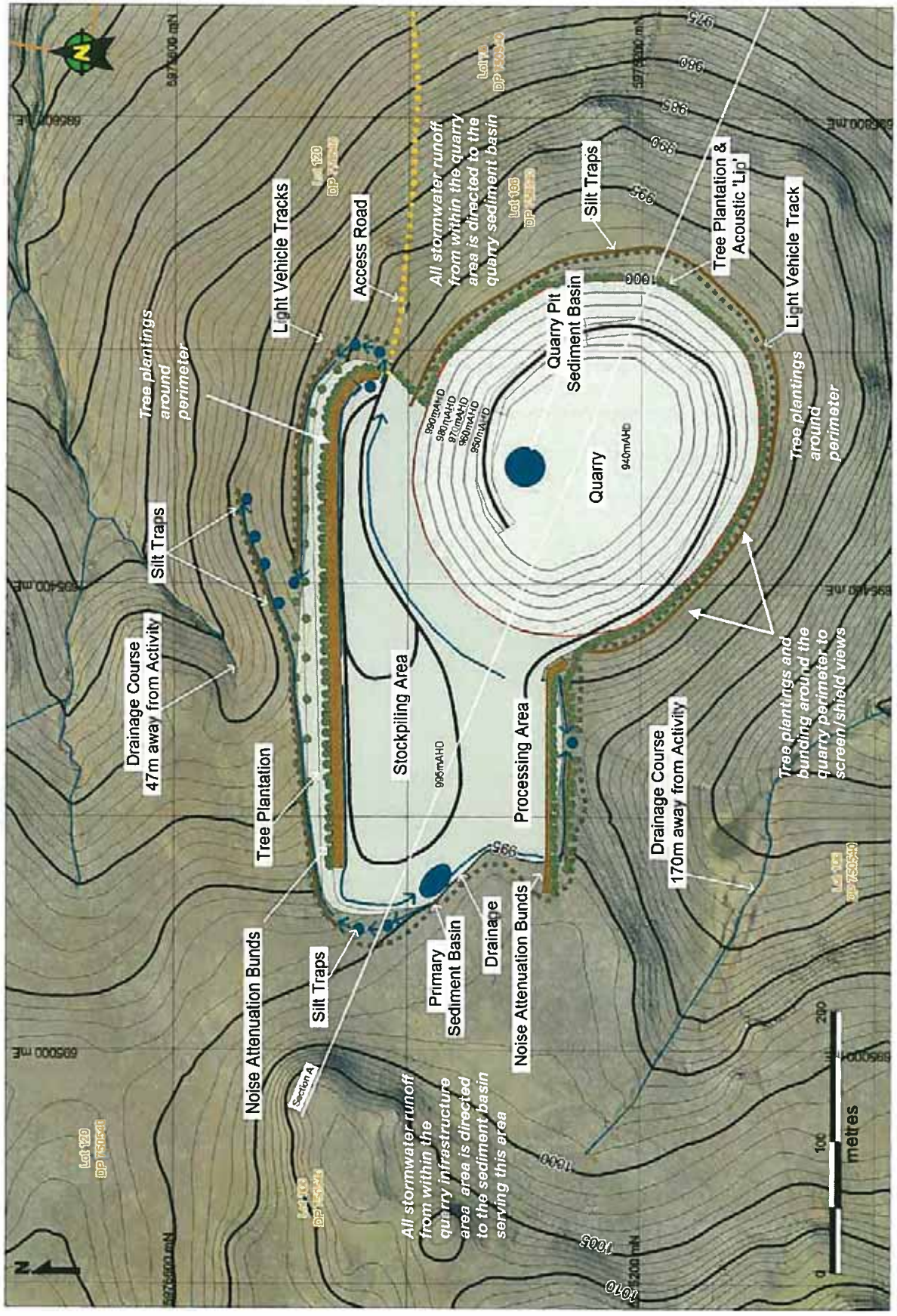


FIGURE 2.4: Proposed quarry (Source: Tanand 2017)

2.3.2 Management of the quarry operations

As the quarry operator, Schmidt Quarries will be responsible for all activities on-site and managing the functioning of the quarry and site personnel. It will be their responsibility to ensure all environmental measures are in place and are being managed according to any issued Development Consent. The quarry operator will also be responsible for the environmental practices undertaken by site personnel in performing their duties. Schmidt Quarries will oversee and manage all issues associated with the quarry including, but not limited to, the following:

- Implementation of any issued development consent.
- Compliance with all relevant requirements of any licence issued by the NSW EPA.
- Ensuring that all site safety protocols are in place.
- Undertake site inspections with the mines inspector, EPA and Council, when required.
- Manage quarry pit works, stockpiles and onsite water and soil management.
- Contractor/employee/visitor management.
- Respond to environmental incidents.
- Liaise with government agencies and relevant stakeholders.
- Plan and forecast future quarry development and associated works, as required.
- Carry out site rehabilitation and site stabilisation works.

Specific environmental controls to be implemented in and around the quarry are summarised in the accompanying table.

Table 2.2: Summary quarry management/mitigation measures

Management issue	Quarry practice/mitigation measure proposed
Dust control	On site measures used to reduce dust nuisance will comprise: use of water sprays on processing plant and materials stockpiles, drawn from the proposed sediment basin/ dam; use of a water tanker during dry and windy weather; the pre-coating of aggregate for some orders; the carrying out of blasting using sequential firing; and the proper maintenance of vehicles and equipment. The resource does not contain any asbestos. As such, there is no need for any asbestos dust management procedures to be adopted for this quarry.
Sediment and erosion control	A sediment basin is proposed to be located both within the quarry pit and near the quarry processing plant area. The sedimentation basin in the working quarry will also act as the pit's sump.
Landscaping	Screening vegetation is proposed around the perimeter of the working quarry area, to minimise visual impacts. This will be implemented at the establishment phase of the Project. Proposed stabilisation of disturbed areas with grass/tree plantings
Safety	Schmidt Quarries would continue to apply their existing policy of educating and training all employees in accident prevention and the inclusion of safe working practices into day to day operations. This is an integral part of quarry operations. The use of personal protective equipment including high visibility clothing/vests, safety boots, safety gloves, hearing protection and safety glasses would be required to be worn at all time on site.

Fencing and signage	The working quarry area is to be fenced to keep farm animals from the quarry workings. Gates and fences prevent unauthorised entry and be regularly inspected and repaired. Fencing is fitted with signage warning of the quarry works. Locked gates will be included in the fence line. Appropriate signage is to be provided at the entry to the quarry and along the haul route.
Weed control	Weed control measures will be taken at regular intervals or as required. Weeds are to be monitored throughout the duration of the project. Attention is to be given to controlling noxious weeds.
Occupational Health and Safety, Training	All quarry sites are considered workplaces and are subject to the NSW *Work Health and Safety Act 2011* and *Work Health and Safety Regulation 2011*. This also applies to plant and equipment to be used in the proposed quarry. Schmidt Quarries has a policy of educating and training all employees in accident prevention and the inclusion of safe working practices into day to day operations- an integral part of running any quarry operation. Schmidt Quarries also requires the use of personal protective equipment including high visibility clothing/vests, safety boots, safety gloves, hearing protection and safety glasses to be worn at all time on their quarry sites. As with other quarries currently operated by Schmidt Quarries, signs displaying the specific safety requirements of the quarry operation would be installed around the proposed quarry, when in operation. Schmidt Quarries will be responsible for inducting each person on site in the relevant quarry work procedures before commencing work or visiting the the quarry, including environmental incident procedures. While on-site, it will be the responsibility of all employees, contractors and visitors to the quarry to: ➢ Follow all instructions of the Quarry Operator in terms of relevant quarry requirements ➢ Be aware of quarry management requirements relevant to their work in and around the quarry. ➢ Act responsibly and not cause or allow anything to occur that may harm the environment (such as fuel spills, disturbance to plants and animals in vegetated area to the north of and below the quarry areas, uncontrolled dirty water runoff, or excessive noise). ➢ Follow all instructions of the Quarry Operator in terms of relevant quarry requirements. All employees are to be suitably inducted in terms of the above requirements. ➢ Act or undertake activities in safe manner. ➢ Notify management of any incident or accident that may potentially harm the environment or human health.
Waste Disposal	Overburden and waste rock will be used for the construction of the bunds and the internal quarry haul route. The internal haul route will also be maintained in this manner. Bunded areas will contain any localised spillage of oils and greases from fuel stored on site. Any significant spills of chemicals or fuel that could result in contaminated soil will be disposed of at an appropriately licensed landfill or trade waste facility. ➢ Silt removed from the sediment dams will be incorporated into product stockpiles or overburden materials for use in progressive reclamation. ➢ Most quarry waste to be collected and removed by a contractor, including sewage waste and general solid waste. This waste is considered to be a manageable, minor waste source. Other quarry wastes from quarry processing operations or waste rock material will be incorporated into other products or used in on-site rehabilitation, where practicable.

2.3.3 Quarry plant and equipment

The typical plant and equipment to be used at the proposed quarry are set out in the accompanying tables. Predominantly mobile plant will be used for about the first 5 years of quarry operations, with fixed plant anticipated to be progressively introduced thereafter. This may change depending on a range of factors, including market demand. Additional plant may be brought in for larger quarry orders.

Table 2.3: Typical Quarry Plant & Equipment 0-5 Years

Quarry plant & equipment 0-5 Years	Typical usage
Drill rig	1 week per month (40 hours approx.)
30 tonne excavator for shot rock loading	8-10 hrs per day
40 tonne dump truck, carting shot rock to crushers	8-10 hrs per day
Mobile Jaw Crusher Pegson XA400	8-10 hrs per day
Mobile Cone Crusher Pegson 1000SR	8-10 hrs per day
Mobile Screen 1400 Chieftain	8-10 hrs per day
Mobile Screen 2100 Chieftain	8-10 hrs per day
Wheel loader Sales L220 Volvo	12-14 hrs per day

The above plant is currently in use at Schmidt Quarries' Nerriga basalt quarry.

Table 2.4: Typical Quarry Plant & Equipment Years 5+

Quarry plant & equipment Years 5+	Typical usage
Drill rig	1 week per month (40 hours approx.)
30 tonne excavator for shot rock loading	8-10 hrs per day
40 tonne dump truck, carting shot rock to crushers	8-10 hrs per day
Diesel 1000kva Generator	8-10 hrs per day
Fixed Jaw Crusher	8-10 hrs per day
Fixed Cone Crusher	8-10 hrs per day
Fixed Impact Crusher	8-10 hrs per day
Fixed Screen 20x6	8-10 hrs per day
Fixed Screen 20x6	8-10 hrs per day
Wheel loader Sales L220 Volvo	12-14 hrs per day

Shot rock from each quarry blast will be transported by dump truck to the quarry crushing plant. Refer to photograph below.

PHOTOGRAPH: Typical dump trucks to be used in quarry

(Source: Schmidt Quarries Nimmitabel quarry October 2017)

The processing plant will reduce the size of the volcanic rock resource by crushing, then screens are used to separate the materials into various sizes and product types. Some blending of materials will be carried out to achieve required product specifications.

Raw material won from the worked quarry face is then dumped into a feed hopper from where it feeds into a primary crusher. "Scalps" or waste materials are then separated and the crushed rock conveyed to a primary rock stockpile.

Processed quarry rock is then transferred by conveyor to different sized screens for segregation into various products. Screens separate the rock into categories called spalls, dry dust, road base and ballast. Some of the material will be recirculated for further crushing to ensure all rock is effectively processed to the desired product size. Aggregate is then screened a second time and stockpiled into nominal sizes. Crushing and screening production output will vary according stage of quarry extraction reached, the materials won from the pit and specifications to which they are being crushed. The fixed plant will run on diesel-generated electricity.

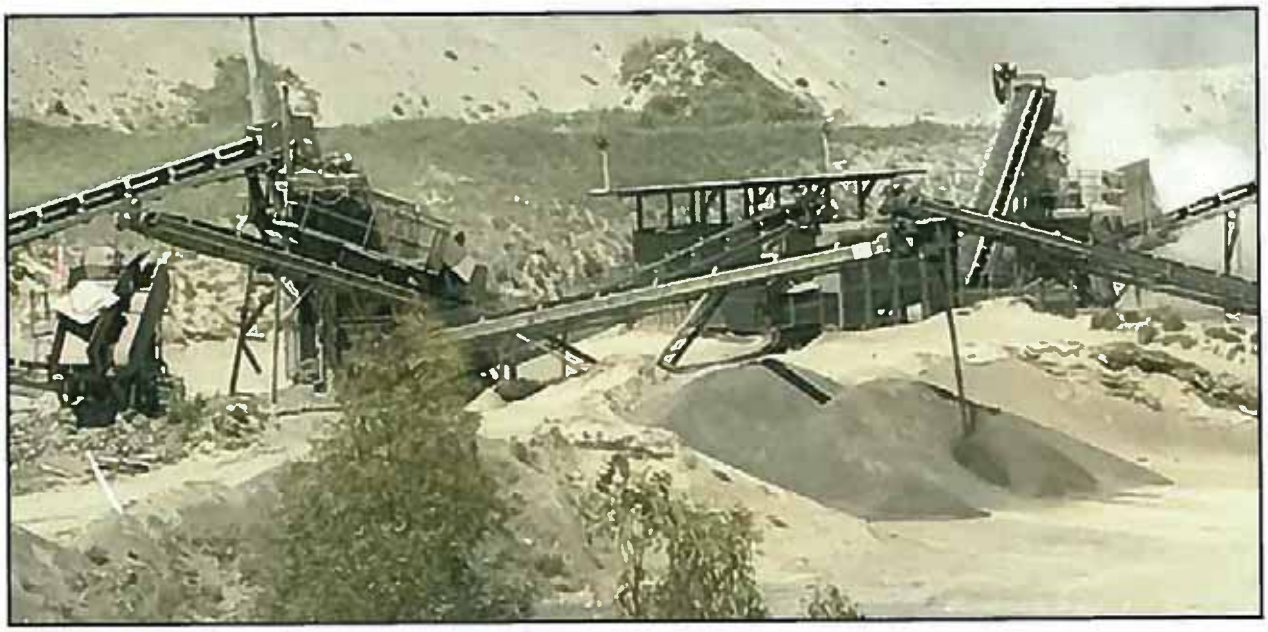
Over the life of the Project, the type make and model of plant will change according to a range of factors, including plant upgrades, manufacturers design improvements, or the addition of equipment provided by contractors. All practical measures will be used to silence construction equipment, particularly in instances where extended hours of operation are required. No quarry operations are proposed on Sundays or public holidays. Standard construction noise mitigation treatments involving operational management techniques (eg avoidance of mobile equipment clustering) and regular equipment maintenance will be employed to control the extent of the noise impacts around the processing plant site at the quarry pit level. Refer also to Section 2.3.3.

Mitigation Measures: Operation of Plant and Equipment

The following measures form a part of the practices proposed at the quarry, in order to ameliorate the impacts associated with the operation of plant and equipment at the quarry site:

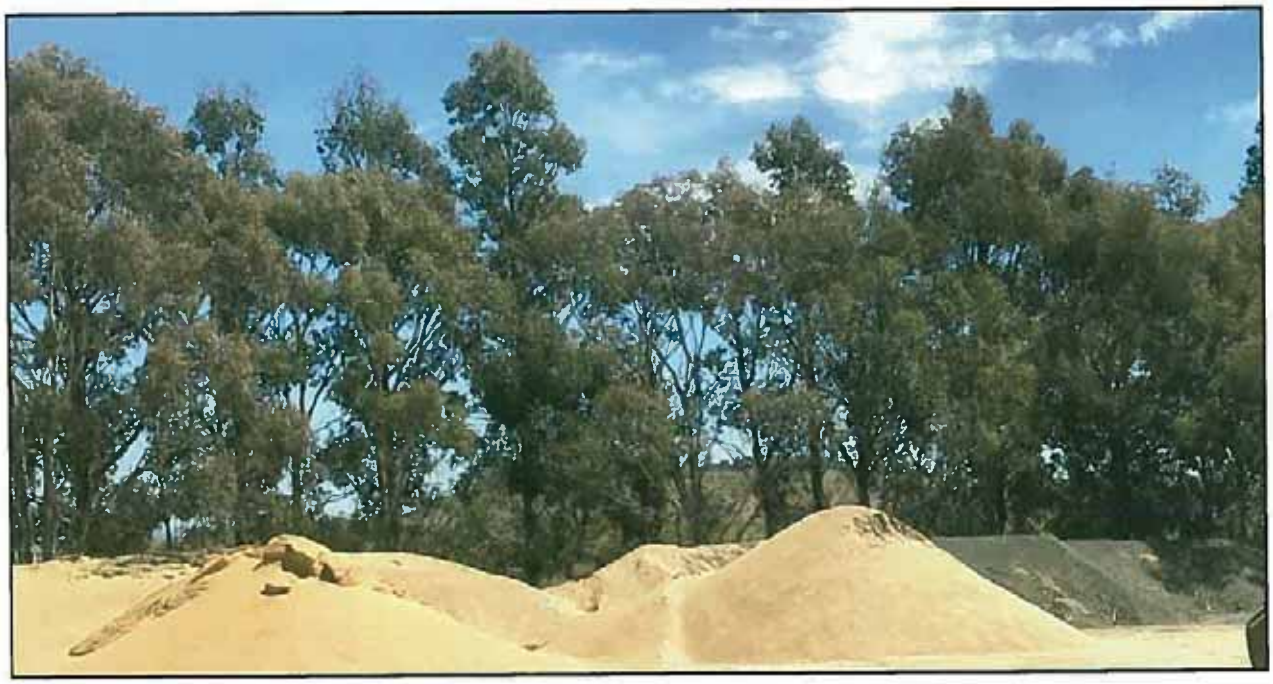
Table 2.5: Quarry plant & equipment- practices & mitigation measures

Plant & equipment management issue	Proposed quarry practice/mitigation measure
Landscape	Vegetation plantings and bunding proposed around the southern, eastern and northern perimeter of the working quarry area, including areas dedicated to quarry stockpiles and quarry processing plant, to screen views of quarry [NOTE: For a significant part of the quarry life, quarrying will occur behind the prominent knoll, shielded from view]
Noise limits	Noise emissions from the quarry, when measured at the residence, will not exceed the applicable noise level goals
Hours of operation	Quarry activities including crushing, processing, extraction and work within the quarry generally is to be undertaken between the hours of 7.00 am and 6.00 pm Monday to Friday and 7.00am to 1.00pm on Saturdays, excluding public holidays
Maintenance of plant & equipment	The crushing and processing plant area will be regularly maintained to prevent excessive build-up of settled fine material that may be transported by wind. All equipment will be maintained in good working order to limit exhaust fumes. Maintenance of plant & equipment proposed to be generally Monday-Saturday 7.00 am to 6.00 pm, however in emergency situations maintenance works may be required at any time
Water sprays	The use of water sprays on processing plant and materials stockpiles
Use of water tanker to suppress dust within the quarry	The use of a water tanker during dry and windy weather, in order to reduce dust nuisance- as is the case with nearby Nimmitabel quarry operation. Refer to accompanying photograph. In the establishment phase of the quarry supplementary water can be provided form the Nimmitabel quarry if required
Regular inspections	Regular inspections for excessive visible dust generation are to be undertaken and appropriate controls will be implemented when such events occur
Training of personnel	Quarry personnel will be provided with training during induction in dust controls for quarry operations
Fuel storage, signage	Fuel to be stored on site in bunded areas/self bunded fuel tanks- as is the case with nearby Nimmitabel quarry operation. Appropriate signage to be employed in and around the quarry site. Refer to accompanying photographs



PHOTOGRAPH: Quarry processing plant at Schmidt Quarries' Nimmitabel quarry

(Source: Schmidt Quarries Nimmitabel quarry October 2017)



PHOTOGRAPH: Quarry stockpiles screened from the nearby Monaro Highway by tree plantings, at Schmidt Quarries' Nimmitabel quarry. Similar screening to be employed around the perimeter of the proposed quarry

(Source: Schmidt Quarries Nimmitabel quarry October 2017)

2.3.4 Blasting of Rock

Drilling will be carried out using track mounted hydraulic drilling rigs fitted with dust extraction equipment. Blasting will reduce most in situ rock to smaller pieces of less than one cubic metre in size. Oversized material remaining after the blasts will be separated prior to crushing. Drilling for each blast will take up to 30 hours and generally consist of up to 100 holes drilled to up to 15 metres depth. Each blast can yield up to 28,000 tonnes of fragmented rock.

The quarry has been designed to ensure acceptable noise, blasting and dust emissions.

To minimise vibration and noise impacts, blasting will be restricted to between the hours of 9.00 am to 3.00 pm, Monday to Friday.

At the maximum proposed annual production rate of 280,000 tonnes, an average of approximately 10 blasts would be required each year.

All drilling and blasting activities will be carried out by an experienced contractor who brings on site all necessary components and after the blast removes all unused materials. No explosive materials are to be stored on site. It is proposed that, whenever possible, blasting will be undertaken when meteorological conditions are favourable. Notification and warning arrangements for each blasting event would be as follows. All residents within the immediate vicinity of the Site would be notified in writing with a copy of these Blast Warning procedures and will be advised verbally at least 24 hours prior to every intended blast. Typically:

- A modulated frequency siren will be played with one long blast of 15 seconds duration one minute before firing.
- The signal "fire" given immediately before the charges are fired.
- The siren will be played with three short blasts of one second duration each separated by one second as an "all clear" signal.

Before firing commences all personnel shall be warned and shall move to a safe place until the "all clear" signal is given. Residents of dwellings within 2km of the quarry will be informed a minimum of 24 hours in advance of any proposed blast. Signs will be displayed at the main access to the site while blasting preparations are being made, and until the "all clear" signal is given.Detailed monitoring is undertaken of each blast.

No explosives will be stored on site.

Licensed contractors will continue to be utilised to convey, load, prime and detonate all explosives on site. Provided that blasting continues to abide by the requirements of the original consent (ie. maximum blast overpressure not to exceed 115dB (Linear Peak) and Peak Particle Velocity not to exceed 5mm/second at any nearby residence) the quarry can operate at a higher level of production.

The blasting modelling results predict that blasting will comply with relevant vibration and overpressure requirements. Blasting will be strictly controlled and monitored in order to achieve compliant levels of ground vibration and airblast overpressure at the nearest rural dwelling to the south. Blast procedures and designs have been prepared in consultation with existing local blasting contractors to ensure:

- Relevant Council/EPA noise and overpressure (vibration) requirements are satisfied.
- Safety is assured.
- The blasting achieves an adequate fragmentation of rock.

Mitigation Measures: Blasting

The following table summarises the mitigation measures forming a part of the blasting practices proposed at the quarry, in order to ameliorate the impacts associated with blasting.

Table 2.6: Quarry blasting practices & mitigation measures

Blasting issue	Proposed blasting practice/mitigation measure
Airblast and vibration limits	All blasts will be monitored in order to comply with the following criteria: airblast overpressure from any blast shall not exceed 120 dBL at the nearest residence and 95% of all blasts over a 12 month period shall not exceed 115 dBL at the residence; and ground vibration from any blast shall not exceed 10 mm/s at the nearest residence and 95% of all blasts over a 12 month period shall not exceed 5 mm/second at this residence
Size of blast	A Maximum Instantaneous Charge (MIC) of 225kg will apply for each blast
Blasting technique	All blasts will be initiated using delayed detonation techniques to assist in reducing impacts
Stemming of blast holes	All blast holes will be adequately stemmed to minimise gas and dust emissions from blasting, as well as minimising the potential for fly rock
Limits on hours of blasting	The detonation of blasts will be restricted to between the hours of 9.00 am to 3.00 pm, Monday to Friday. No blasting will be undertaken outside of these hours. [NOTE: preparation for blasting, including drilling, is allowed outside of these time restrictions]
Review of weather conditions prior to blasting	The Quarry Operator or delegate will undertake a pre-blasting review of weather conditions to identify any conditions which may significantly increase blasting impact or dust impacts. When weather conditions are suitable or if safety requirements dictate at other times, the Quarry Operator or delegate will issue a blast clearance prior to each blast proceeding
Monitoring of blasting	All blasts shall be monitored and the results included in the annual quarry report to be provided to both Snowy- Monaro Council and the NSW EPA.Records will be maintained for each blast, to be included in any Annual Report

2.3.5 Transport

Transportation of quarry products is proposed by truck and trailer ('truck and dog') style vehicles from the Site to service markets- refer accompanying photograph of typical haulage vehicle, on EIS page 48. Smaller trucks may also be used. NOTE: a nominal truck and dog payload of 39 tonnes has been assumed. The Applicant proposes to establish a hard rock quarry, to extract and process a maximum of 4.6 million tonnes over a 30-year period, at an average rate of some 150,000 tonnes per year (maximum of 280,000 tonnes per annum). However, the demand for quarry product is not usually constant, with the local civil construction industry varying between periods of peak and quiet activity. The main customers for existing local quarries are concrete batching plants, and roadworks projects. While the deliveries of gravel to concrete batching plants are generally steady, the demand for gravel on roadworks projects varies greatly. Schmidt Quarries has advised that a current peak day demand for quarry product would be a maximum 2,500 tonnes. This would require an estimated 64 laden trips to deliver the quarry products, or a maximum 128 return trips [NOTE: not all gravel deliveries will include a return trip]. This averages out to approximately 13 return trips per hour (for a 10-hour working day) on a peak day. However, it is likely the number of hourly trips will be greater in the morning than afternoon, with 8 laden trips (or a total of 16 trips) per hour adopted as the maximum number of movements for the purposes of this assessment.

PHOTOGRAPHS: Typical self-bunded fuel tanks (left hand photo above) and water truck (right hand photo above) currently employed at Schmidt Quarries Nimmitabel quarry operation. Both of the above measures are to be employed at the proposed quarry

(Source: Schmidt Quarries Nimmitabel quarry October 2017)

PHOTOGRAPHS: Typical safety signage currently employed at Schmidt Quarries Nimmitabel quarry operation. Similar signage measures are to be employed at the proposed quarry

(Source: Schmidt Quarries Nimmitabel quarry October 2017)

In addition to the haulage movements generated by the quarry, the Project will employ truck drivers, plant operators and administrative staff, who will commute to the site from Cooma and other locations. As with the existing Schmidt Quarries quarry operations at other locations in the region, it is expected that staff will arrive at the site from around 6.00 am at a rate of about 5 per hour through to 9.00am. Similarly, staff will leave work from mid-afternoon at a similar rate. The internal haul road works will consist of road construction and drainage works in accordance with civil engineering best practice guidelines in accordance with expected use and frequency of quarry truck traffic. The haul road is proposed to pass over a disused rail line, near the Monaro Highway. Two access options are available to the highway from the rail crossing: Option 1 utilising an existing access point; Option 2 avoiding a habitat of a threatened lizard species.The only works which will be carried out over this rail line will be upgrading of the existing farm access track in order to accommodate quarry truck traffic and removal of any rail line, if required by the Transport for NSW and/or John Holland. Refer **Figure 2.1**.

Mitigation Measures: Transport

The following measures form a part of the practices proposed at the quarry, in order to ameliorate the impacts associated with quarry truck traffic to and from the quarry site:

Table 2.7: Quarry transport practices & mitigation measures

Transport issue	Proposed transport practice/mitigation measure
Haul road	Maintenance of the internal haul road in a good (unsealed) condition. Internal haul road to be regularly graded, to ensure a satisfactory road surface is maintained to prevent corrugations which can contribute to truck road noise. Any work on the rail crossing is to be in accordance with Transport for NSW requirements
Intersection of haul route with Monaro Highway	Upgrade the intersection with theMonaro Highway to RMS requirements. two access options have been considered- refer to Streetwise traffic report for details
Use of water cart on internal haul route	Use a water-cart or truck for dust suppression 'as and when required'
Truck speed limit	In order to reduce dust nuisance and as a safety measure, limit haul road truck speed to 40 km/hr by erecting speed limit signage at the Monaro Highway ingress point, along the haul route, and at the egress of the quarry processing plant area
Covering of truck loads	All loads on outbound haul trucks are to be covered, with tailgates effectively sealed, before trucks leave the stockpile loading area, to minimise dust and debris potential
Vehicle standards	All haulage vehicles should be maintained and operated in accordance with Australian Design Rules and manufacture's specifications. All Vehicles should be fitted with well maintained engine mufflers
Protocols, incident management	Ensure that all truck drivers are aware of protocols for entering and leaving the site. Regular inspection of road surfaces, lines of sight and inspection of safety signs for damage, general condition. Any traffic-related complaints received and details of any transport related accidents, incidents or near misses at the quarry will be recorded. Where inspection or reporting indicates product spillage or build-up, clean up the product spillage or build-up of gravel/clay material, as soon as reasonably practical. The quarry operator will investigate complaints and take actions, as required

PHOTOGRAPH: Typical Schmidt Quarries "truck and dog" haulage vehicle. The same or similar haulage vehicles are to be employed at the proposed quarry

(Source: Schmidt Quarries)

2.3.6 Hours of Operation and Workforce

The quarry is proposed to to operate between 7.00 am and 6.00 pm Monday to Friday and 7.00am to 2.00pm on Saturdays, excluding public holidays. Approval is sought of the maintenance of plant and equipment proposed to be generally Monday-Saturday 7.00 am to 6.00 pm, however in emergency situations maintenance works may be required at any time. Hours of blasting are proposed between the hours of 9.00 am and 3.00 pm Monday to Friday.

The Project will provides full-time employment for up to approximately 6 persons and part-time employment for 4 persons-almost all of which all are employed locally. This will increase for any larger project, as demand warrants. On site staff would include:

- Quarry Operator/Manager.
- Administration.
- Leading hand - quarry.
- Loader operator.
- Quarry truck drivers.
- Processing plant operator(s).

In addition to the operator's trucks, independent carriers will also provide for transport of quarry product from the quarry pit to customers. From time to time other contractors will be engaged to carry out quarry-related work including a bulldozer for topsoil and weathered rock stripping, as well as a blasting contractor, to undertake periodic blasting of rock from the quarry faces. A number of contract employment opportunities will be provided for truck drivers and people involved in specialist services and repair and maintenance of plant and machinery.

2.3.7 Water Management

Water management generally:

Water required on the site will be required for several uses: employee use; dust suppression; and rehabilitation.Employees will only require a small potable water supply. Water for human consumption will be delivered to site by commercial suppliers and does not form part of the site water management system. Dust suppression is required for internal haul roads, processing and access areas.

If required during the establishment phase of the proposed quarry, Schmidt Quarries will utilise water from the Nimmitabel quarry sediment basin, with water supplied by way of a water cart. This arrangement will continue during the initial stages of quarrying. Rehabilitation of the site and the proposed growing of various tree species on quarry benches and on the bunds surrounding the quarry site will require watering, particularly in the case of the initial plantings. Once sediment basins are established on site non- potable, 'dirty' water will be obtained from the on-site sediment pond system. Refer also to **Appendix H**.

Dirty water management:

The 'dirty' water management system has been designed in accordance with *Managing Urban Stormwater: Soils and Construction (the Blue Book), Volumes 1, 2C and 2E* to manage runoff from the 5 day, 95th percentile rainfall event. A water balance model for the proposed quarry, prepared by Geolyse, accompanies this EIS. 'Dirty' water runoff will be captured by the two proposed sediment basins: one in the quarry pit (minimum 2,638m^3 storage capacity); the other servicing the quarry infrastructure area (minimum 3,063m^3 storage capacity). Water from this sediment basins will be pumped into tankers for spraying as appropriate around the site. In the event that there is insufficient water in the basin, it is proposed to truck water in from off- site sources.

As shown on the accompanying quarry plans, all rainfall run-off within the active quarry area ('dirty water') will be directed to the sediment basin system, one serving the quarry pit, the other serving the stockpile and quarry processing area.

Clean water management:

The 'clean' water management system will prevent 'clean' water mixing with 'dirty' water that is within the quarry working area. The proposed clean water management system includes a series of diversion drains and catch drains, and clean water catch dams/silt traps around the northern and southern perimeter of the working quarry, including operational areas, in order to capture and divert stormwater runoff away from active quarrying and operational areas. As quarrying progresses, the clean water controls will be maintained by the construction of additional (further extended) bunds, drains and catch dams/silt traps as needed. The catch drains, contour banks and catch dams/silt traps will be constructed, where required, and maintained during the life of the quarry operation by regular inspection and repairs. Sediment deposits will be removed from the catch dams/silt traps as required. Erosion of banks will be repaired and improved if necessary. Vegetative cover will be re-established if necessary on banks and topsoil areas by light cultivation, re-seeding, fertilising, and water, if necessary.

Soil & erosion controls:

Soil erosion controls are largely focused on the prevention of erosion and sedimentation of runoff stormwater. These controls will be implemented to mitigate the impacts of initial establishment and quarry operations on nearby watercourses to the north and to the south of the active quarry area. Standard erosion and sediment control techniques will be used in accordance with the requirements of *Managing Urban Stormwater: Soils and Construction (the Blue Book)* (Landcom 2004 and DECC 2008).

The proposed quarry site offers favourable features that would assist soil erosion and sediment control, namely:

- A small catchment area. The quarry site sits virtually at the top of the local catchment, with no runoff likely from areas upslope.
- The quarry is set back more than 40m from any any defined watercourse near the quarry.
- Lack of evidence of any significant erosion of the existing landform near the quarry site.
- The use of surrounding lands for pasture.

The water quality pond system at the floor of the quarry pit will trap sediment and silt from disturbed areas within the quarry pit. Likewise, the quarry infrastructure area (stockpiles, processing plant and associated quarry facilities) will also be provided with a separate sediment basin, to collect runoff from this area. The floor of the quarry and the quarry infrastructure area will be angled to ensure that water drains towards the sediment basins. As the quarry is progressively deepened the sediment basin there will be progressively developed and expanded.

Mitigation Measures: Water

Erosion and sediment control measures are to be implemented during the carrying out of any quarrying or on-site works. These measures form a part of the practices proposed at the quarry, in order to ameliorate the impacts associated with the operation of the quarry. Other measures will be employed to control the potential for erosion and sediment impacts, summarised below in accompanying Table 2.8.

Table 2.8: Quarry water practices & mitigation measures

Water issue	Proposed water management practice/mitigation measure
'Dirty' water & sediment basins	The dirty water management system is configured to capture and contain runoff to within the active quarry area, including stockpile and crushing plant areas, in order to prevent pollution of downstream waterways. The system includes catch drains and sediment basins- one within the active quarry, the other within the operational quarry area- located to capture and manage runoff from disturbed areas within the proposed quarry. Designed in accordance with *Managing Urban Stormwater: Soils and Construction (the Blue Book), Volumes 1, 2C and 2E*
Internal haul route	The internal access route/haul road will be constructed to an all-weather standard. It will be used for all traffic movements between the Monaro Highway and the quarry. By ensuring all traffic movements are confined to a set route, soil erosion can be kept to a minimum. A Shakedown Pad will be installed at the entrance to the quarry work area
Minimising site disturbance, maintenance of vegetative cover	Minimising the area of disturbance during initial site works, road construction and quarrying, through the adoption of the following quarry practices: ➢ All possible sediment controls are installed before commencing work. ➢ Minimise the area of soil exposed at any one time and maintenance of a vegetation cover on non-operational undisturbed areas. ➢ Where available, conserve topsoil for later re-use on site
Rehabilitation of disturbed areas, bunds	Implementation of an effective revegetation, rehabilitation and maintenance program for the quarry site. Overburden to be used in bunding the quarry on the northern and southern perimeters. The bunds will be constructed along a contour line, to minimise the risk for erosion. Rehabilitation of disturbed areas is proposed when no longer required for operational purposes. Disturbed areas will be topsoiled and revegetated using a combination of pasture grasses and cover crops to stabilise the ground surface

In addition to the above, the following procedures and management practices will be implemented to further reduce the risk of erosion and sedimentation within the quarry area (quarry pit and quarry infrastructure area):

- The erosion and sediment control structures will be inspected regularly, or after any major rainfall event, to assess their success in preventing erosion, identify signs of potential erosion and retained capacity within the sediment basin.
- The erosion and sediment control structures will be cleaned of accumulated sediment material (or extended or replaced) as soon as approx. 30% capacity is lost due to the accumulated material such that the specified capacities are maintained.
- A flocculent will be added, if required, to the water contained within the sediment basins to increase the efficiency of sediment settlement. Alternatively, consideration will be given to augmenting or building additional sediment basin(s) to provide greater settlement time for the sediment containing water.
- The regular and ongoing inspection and maintenance requirements for sediment control structures.

2.3.9 Soil Management

The following summarises the these adopted measures, considered also relevant for the proposed quarry operations. These measures have been modified where required.

Soil Management Measures Prior to Quarrying

Soils on the quarry face do not occur in any significance. Any 'A horizon' soils that may occur in the areas yet to be developed for quarry purposes will be stockpiled in a bund/diversion bank along the western side of the quarry (but removed from any actively utilised agricultural land). These stockpiles of topsoil that have not naturally established a ground cover following 3 months, will be seeded with a non-persistent cover crop.

Soil Management Measures During Life of Quarry

During quarrying operations the following management measures will be undertaken in order to maintain and utilise the nutrient value of the cleared topsoil, ensuring erosion control measures are implemented during operations:

- The quarry operator would carry out induction for all employees and contractors, including instruction regarding quarry site rules (e.g.: only using designated roads, tracks and trails or predefined areas).
- Sediment and erosion control structures are to be installed for the life of the operations. These controls are to be stable and capable of being structurally sound for the duration of disturbance. Drainage and runoff will be controlled by diversion drains and bunds to ensure no foreign substrates or materials leave the site. The quarry operator is responsible for ensuring the drains are installed.
- Within the quarry pit and quarry infrastructure areas, any available subsoil would also be stripped from range approximately 20 centimetres in depth up to 100 centimetres in depth, where possible, with the aim to strip an average thickness of approximately 50 centimetres of subsoil to provide sufficient material to achieve successful rehabilitation of final surfaces.
- Prior to blasting, accessible upper 10 centimetres to 20 centimetres of topsoil would be progressively stripped, together with the remaining grass cover. The stripping of the upper layer of topsoil ahead of blasting shall cease where excessively coarse or large stony material is encountered.
- During the years of operation until final surfaces are created, all topsoil and subsoil will be stockpiled within the designated stockpile area along the northern and southern boundaries of the quarry area (ie. quarry pit as well as quarry infrastructure area).

- Topsoil and subsoil will be stockpiled according to grade (topsoil and subsoil). Stockpiles shall be constructed with a slope no greater than 1:2 (V:H) and the surface left 'rough', in a micro sense, to assist in runoff control, seed retention and germination.
- Quantities of actual stockpiled material will be recorded by the quarry operator annually and a soil balance for rehabilitation purposes be updated regularly.
- Any infrastructure and machinery required for the extraction activities would be positioned to avoid retained native vegetation and any topsoil stockpiles.
- Care is be taken to ensure that driving of machinery near the topsoil and subsoil stockpiles is avoided, through bund, sediment fence, separated placement and signage where necessary (to prevent compaction).
- The use of soil ameliorants/fertiliser to improve the nutrient properties of the soil would be investigated where subsoil is relied upon for rehabilitation.
- Any noxious weed and other weed material encountered during activities, should be destroyed and/or removed from the site using appropriate methods to ensure weeds do not spread to other sites, especially in regards to invasion of farm land and drainage lines. Chemicals used would not be harmful to aquatic species.

2.3.10 Waste Management

A range of waste streams will be generated through the life of the quarry project, with differing management strategies required depending not only on the types of waste generated but also the stage of the quarry. The types of waste likely to be generated by the proposed quarry operation would include the following:

- Oils and grease from plant, equipment and vehicle servicing areas of the quarry, as well as chemicals, solvents and paints.
- Used quarry machinery and equipment, including used conveyor belts, crushing cones/plates and screens from the quarry processing plant, as well as used fuel and oil drums, gas cylinders, containers, bags and packaging.
- Quarry-related consumables such as batteries, tyres and oil filters.
- 'Dirty' water from sediment basins (including silt and fines), truck wash down facilities, washing plant and from any cleanups initiated eg. from accidental spillage of fuels.
- Waste from on-site sewage treatment systems.
- Overburden and stone mixed with overburden, as well as excess crusher dust.
- General rubbish and litter. Includes paper and general wastes from any office, workshop or amenities facilities on site.

The elements of any subsequent waste management plan, to be incorporated into an overall quarry plan of management , are outlined below, based on the following outcomes:

- Apply the waste management hierarchy of "avoid, reduce, recycle, recover, treat and dispose".
- Aim to minimise production of waste from quarry-related activities on site.
- Avoid contamination of land and water.
- Minimise the generation of regulated waste.
- Minimise adverse effects to significant flora and fauna.
- Minimise potential risks to workers and the public.

Mitigation Measures: Waste

Waste management measures are to be implemented during the carrying out of any quarrying or on-site works. These measures form a part of the practices proposed at the quarry, in order to ameliorate the impacts associated with the operation of the quarry. Measures will be employed to control the potential for waste impacts, summarised below in accompanying Table 2.9.

Table 2.9: Quarry waste management and mitigation measures

Waste strategy	Proposed waste management practice/mitigation measure
Waste avoidance	Waste avoidance measures would include: ➢ Use of recyclable materials and containers were practicable. ➢ Purchase of consumables in bulk, rather than in small containers. ➢ Ongoing maintenance and operation of equipment and the keeping of all equipment in good working order. ➢ No building, plant and machinery, or putrescible wastes to be disposed of on site. ➢ No waste generated off site is to be stored on-site, treated, or processed on-site. ➢ Encourage staff to adopt waste-reducing practices.
Waste re-use	Waste re-use measures would include: ➢ Use of waste overburden and rock, including surplus crusher dust, in the building, repair and maintenance of internal roads, quarry working pads, sediment basins, bunds and in general land forming. In this regard, it is most unlikely that any road making material will need to be imported from off-site sources to build the internal quarry haul route. ➢ Use of silts from sediment basin system in rehabilitation areas. ➢ Re-use of 'dirty' water from within the quarry for dust minimisation, general watering (including rehabilitated areas), and in the processing of quarry rock products.
Waste recycling	Waste recycling measures would include: ➢ Collection of recyclable material (waste oil, metal, glass, and plastic) for collection by Council or appropriate recycling contractor. ➢ Dispose of non-recyclable domestic waste via council collection service. ➢ Encourage the recycling of used plant and equipment to the maximum practicable extent.
Waste disposal	➢ Appropriate disposal of any on-site amenities effluent. ➢ Appropriate disposal of all waste by a licensed contractor and/or Council.
Monitoring and reporting	The quarry operator will conduct an monthly inspection of on-site sorting of recyclable materials to ensure that storage waste containers are not overflowing, no odours are being created, there is no potential for weeds or vermin becoming established, and that there is no potential for fire risk.The quarry operator will ensure that the waste treatment measures are implemented at the quarry.
Incident or Failure & Corrective Action	The following measures are proposed: ➢ Identify source of offending waste and report to management. ➢ Remedial works to be carried out where required. ➢ Quarry operator to identify reasons for incident or failure and rectify.

Waste management procedures are required for dealing with regulated wastes such as tyres, batteries, paints and solvents. These wastes are to be accounted for and removed to a suitably licensed disposal facility. Non-regulated waste, such as office waste not suitable for recycling, can be removed from site by a commercial waste contractor.

2.3.10 Fire safety

The threat from fire includes equipment fires and grass fires occurring within the property and fires threatening the property from external sources. No part of the Project Site is mapped as comprising bushfire prone land. As such, there should be minimal risk of fire outbreak on the site or surrounds caused by activities associated with quarrying. It is proposed to prepare a Bushfire Emergency Response and Evacuation Plan for inclusion in the final quarry management plan for the Project, once approved.

Mitigation Measures: Fire safety

The following procedures are proposed to ensure that the potential for fire outbreak is minimised:

Table 2.9: Quarry fire safety practices & mitigation measures

Fire safety issue	Proposed fire safety practice/mitigation measure
Fire fighting equipment	Fire fighting equipment to be stored at the quarry site. Includes fire extinguishers. Fire extinguishers to be provided in all mobile equipment. The extinguishers are to be serviced regularly.
Explosives on site	No explosives to be kept in the quarry
Use of water cart & pumps	Maintenance of a water truck and pumps suitable for fire fighting at the site
Employee training	Work instructions to include emergency response procedures, applicable during a fire emergency: ➢ Equipment available on the premises. ➢ Responsibilities of personnel. ➢ Rural Fire Service contact details. ➢ Regular visual check and testing of equipment. ➢ staff training for fire emergencies.
Flammable liquids	Flammable liquids are stored appropriately. Gas storage bottles are to be kept secure.Fuel storage facilities should be located and designed to prevent potential fire hazards, as required by *AS1940-1993- The Storage and Handling of Flammable and Combustible Liquids*. Fuel storage areas are to be bunded.
Monitoring	Reporting fires or potential for fire to quarry management

All workplace amenities, offices, workshops, vehicles, plant and storage facilities including those of contractors will have a suitable type and number of fire extinguishers available for use in the event of a fire. AS2444 provides details on the various extinguishers available, their use and effectiveness for various types of fire.

All bulk storage of fuels, oils or other products should be in accordance with the relevant Australian standard.

Signage will be located at all extinguisher locations on the quarry site to indicate the extinguisher type and suitability for the fuels, oils or other products stored on site.

2.3.11 Emergency and Hazards Management

Significant events at the quarry that may threaten the environment or public health include excessive rainfall, fire, fuel spillage on the access road, blasting mishap, unauthorised access or major truck accident. Other potential occurrences such as power failure, pump failure or spillage within the quarry would be unlikely to present a threat to the environment or public health as the effects would be contained within the quarry, allowing rectification to be planned and implemented in a co-ordinated manner. Should a major pollution incident occur affecting the external environment, the EPA will be advised by telephone as soon as possible and provided with written details as required.

Schmidt Quarries has in place a Pollution Incident Response Plan (PIRP) for it's Nimmitabel quarry operations. The PIRP would also be applied to the Project.

Mitigation Measures: Emergencies and Hazards

The following are to be taken to minimise the risks arising from the above types of emergencies:

Table 2.10: Quarry emergency practices & mitigation measures

Emergency/hazard	Proposed emergency/hazard practice/mitigation measure
Fuel spill	All fuel to be stored within bunded areas. Fuel trucks will visit the site as required for refuelling purposes. In the event of a spillage: ➢ Appropriate steps are to be taken to contain the spill and prevent fuel spread. ➢ Spilt fuel is to be collected where practicable. ➢ The EPA to be contacted in the event of a major pollution incident details. ➢ Should a significant amount of loose material be contaminated with spilt fuel it is to be collected and disposed of at a licensed landfill facility.
Excessive rainfall	Once extraction has commenced, the quarry pit will be capable of retaining runoff from all rainfall within its catchment. While excess water may flood the workings and be a hindrance to operations it will not be an emergency situation. The excess will be flocculated if necessary. The sediment basins will have sufficient capacity to accommodate a design storm events. Should this be exceeded, excess water will be wholly contained within the quarry pit, avoiding downstream flooding impacts from the site.
Unauthorised access	Access to the quarry site will be through gates that will be locked after hours. All personnel entering the site along the quarry access road are required to report to the site office.As such the threat of unauthorised access is very small.
Blasting mishap	Extensive precautions are in place to prevent any incident occurring during blasting (refer to section 2.3.4)
Major truck accident	Potential vehicle accidents on the site include collisions. Should a vehicle be involved in a major accident on the premises, staff will initially attend to the needs of any injured personnel. If there is a spill of fuel, emergency response procedures will be initiated as described above. Should there be a spill of extracted material, steps will be taken to recover the material as far as practicable. The Police will be notified where necessary

Emergency procedures generally	In order to ensure that the environmental impact of catastrophic events is minimised, emergency procedures are to be followed. These include: ➢ The first priority is the safety of any persons either workers or others involved in the events. Whatever reasonable actions necessary to protect safety will be taken. ➢ The second priority is to quickly minimise the environmental damage. All emergency action should take place as soon as possible after the event. Actions to be taken may include the containment of any pollution by booms, silt fences or other means. Supplies of silt fences are to be kept on-site. ➢ Emergency vehicle access will be available through the main access point on the Monaro Highway. Access for police and emergency services will remain open during normal working hours to minimise response times. Liaison will be maintained with the police and emergency services agencies, where required, and a 24 hour contact will be made available for out of hour's emergencies and access
Worker safety generally	All site staff and subcontractors will be required to complete a site specific induction before commencing work on site. The induction will cover aspects relating to safety and amenity; including access, emergency evacuation procedures, location of first aid facilities, location of amenities, site hours, material handling, noise and dust policies and environmental management

2.3.12 Bund Construction and Perimeter Pine Plantings

In order to minimise the visibility of extraction and processing operations from vantage points to the south, east and north of the quarry, and to further reduce noise impacts, it is proposed that an earthen bund wall be progressively constructed along the southern, eastern and northern boundary of the quarry site. The bund would be constructed progressively using overburden material as it becomes available from the advancing extraction area. Refer **Figures 2.1-2.5.** The bund wall would approach a maximum of 3-4m in height.

The batters of the bund wall would approximate 1:2 slope and would be covered with available soil resources and initially sown with a cover crop to stabilise the surface and minimise the potential for erosion, with native tussock grasses introduced on a progressive basis.

Pines planted near the base of the bund wall system.

Pine trees are a part of the cultural landscape of the Monaro Plains- pine trees being a common sight around most homesteads in the region. Pine trees (Radiata Pine) will be planted out in a manner similar to that planted out on the boundary of Schmidt Quarries' Nimmitabel Quarry site, once the bunds and drainage paths around the perimeter of the quarry have been established. The trees, once established, will progressively form a landscaped 'green edge' to the area disturbed by quarry-related activities. The planting schedule proposed, generally in accordance with Forest NSW guidelines, are as follows:

- Quarry establishment: Pine trees panted out once bunds are formed. One seedling planted out every 2.5m around the northern, eastern and southern periphery of the working quarry area. Fertilising and occasional weeding to be applied if and where required.

- Year 2: After 2 years the pine seedlings reach about 2m in height and begin to suppress competing vegetation, achieving a denser band of plantings. Remedial fertiliser to be applied if required. Periodic weeding still may be required.

- Years 5-9: The pine trees should reach a height of up to 6m in height.

- Years 10+: The pine trees should reach a height of up to 20m or more in height.

PHOTOGRAPH: Pine trees are proposed to be planted out around the periphery of the quarry, similar to the boundary plantings of pines employed at Schmidt Quarries' Nimmitabel quarry operations (shown in photo). The trees shown, reaching a maximum height of about 20m, are below a quarry perimeter bund wall, similar to what is proposed on the Project Site

(Source: Schmidt Quarries)

2.3.12 Energy Requirements

The main form of energy consumed as a consequence of the operation will be diesel fuel. In future the proposed quarry infrastructure area may be serviced by mains power. In the interim, the entire quarry will be powered by diesel fuel. The total amount of fuel which will be used by the trucks which will be hauling material from the site will largely depend on the delivery destinations. This includes more distant markets to the east/south, as well as other projects to the north.The amount of fuel used will be a function of the distance travelled. Assuming an average round trip of, say, 150 kilometres, fuel requirements for loading and transporting will be approximately 2,000 litres of diesel fuel per thousand (1,000) tonnes of material extracted. At an assumed annual production of 150,000 tonnes of material per annum, total fuel usage for loading and transporting is estimated at 300,000 litres of diesel fuel. Fuel will also be required for plant used on site. Fuel requirements have been assumed to be approximately 500 litres of diesel fuel per thousand (1,000) tonnes of material extracted. At a assumed annual production of 150,000 tonnes of material, total fuel usage for plant used on site is estimated at 75,000 litres of diesel fuel.

The proposed quarry does not sterilise any known potential source of oil or gas.

2.3.13 Rehabilitation, Decommissioning

Overview

Quarrying is a land use with the ultimate life tied to the availability of the quarry resource: once the quarry resource is exhausted, no further quarrying activities can occur. The proposed quarry and associated uses on the Project Site will not have a significant impact on land or agricultural capability in the Rock Flat locality. Moreover, no impacts are likely to occur on adjacent lands with the only direct impacts on the Project Site confined to those areas immediately impacted upon by the quarrying operation, including the internal quarry haul route. Once completed, the aim will be to rehabilitate to a stable condition suited to the proposed final rural land use, namely, the native tussock grasses and the grazing of livestock -as is now the case. This is an activity that will be compatible with surrounding land uses. In this regard it is envisaged that the site will be rehabilitated to enable the land to used for grazing, a shelter for stock and water supply/dam on the quarry floor, with native tussock vegetation re-planted out in disturbed areas and on the quarry benches. The land capability of this area will not alter from current land capability although the area of the quarry void, to be retained following extraction, will be alteration to the original landform of the Project Site. Refer **Figure 2.5**.

The emphasis of the rehabilitation process will be to ensure that rehabilitation is progressive and provides a long term, low maintenance site. Throughout the life of the quarry, progressive rehabilitation activities will be undertaken on the Project Site. Until such time that quarrying has ceased on the Project Site, rehabilitation will occur around the perimeter of the working quarry area, including areas associated with the quarry processing plant and stockpiles and in the vicinity of the pine tree plantings. It will not involve the pit floor and benches until quarrying is complete. The primary purpose of rehabilitation during the operational phase is to mitigate any visual impacts. All topsoil and some subsoil will be separately removed and stockpiled from each area to be disturbed. Where appropriate, the soil stockpiles would be grassed to ensure stability and nutrient levels until it is used in the revegetation program.

At the completion of quarrying, the quarry will be rehabilitated and shaped. Rehabilitation will take place progressively during the life of the quarry operation, including the following:

- To produce a final landform which would be stable and which would allow the quarry to be used as a water source for future agricultural uses. In this regard, the sediment basins will be retained in the final completed pit.
- Appropriate weed management is proposed, to prevent the spread of weeds.
- Quarry benches will be capped with a layer of overburden and topsoil, and planted with native tussocks.
- Regular watering after initial planting, until seedlings have established. Water would be sourced from the sediment dams in the first instance.
- Quarry equipment and infrastructure not required for the intended final land use is then removed from the site and the site is left in a clean state.
- Planting native tussock species on worked benched areas, bunds and embankments and quarry infrastructure area. This will entail some minor reshaping of the quarry site and surrounds.
- The enhancement of habitat further from the quarry site (ie. downslope from the existing known location of the Striped Legless Lizard) by the placement of additional stone and rock removed from the quarry operations footprint.
- Ensure that suitable fencing is provided, to prevent unauthorised vehicular or pedestrian access to the site.
- The internal access road to be retained, for future agricultural access.

Periodic monitoring is to be conducted to determine the success of rehabilitation measures, and identify maintenance requirements.

Final site end use

The final landforms within the quarried areas will consist of topsoiled benches leading to a pond at the base of the rehabilitated quarry pit, for sediment control and hydrological balance purposes. The areas outside of the active pit are planned to be rehabilitated to a condition which can be managed for agricultural purposes and associated land management practices-most likely returned to grazing land. The potential for progressive rehabilitation of quarry benches during the development of the quarry pit, prior to reaching the final approved quarry floor level, is limited.

Rehabilitation of overburden emplacement areas and bunds

The proposed bunds and overburden emplacement areas are to be progressively rehabilitated with native tussock grass species. Trees are to be planted at the establishment phase of the quarry only, to create a visual screen around the quarry. This will be supplemented through the construction of acoustic bunding on the northern and southern perimeter of the quarry workings, to be replanted with native tussock grasses. Refer **Figure 2.5**.

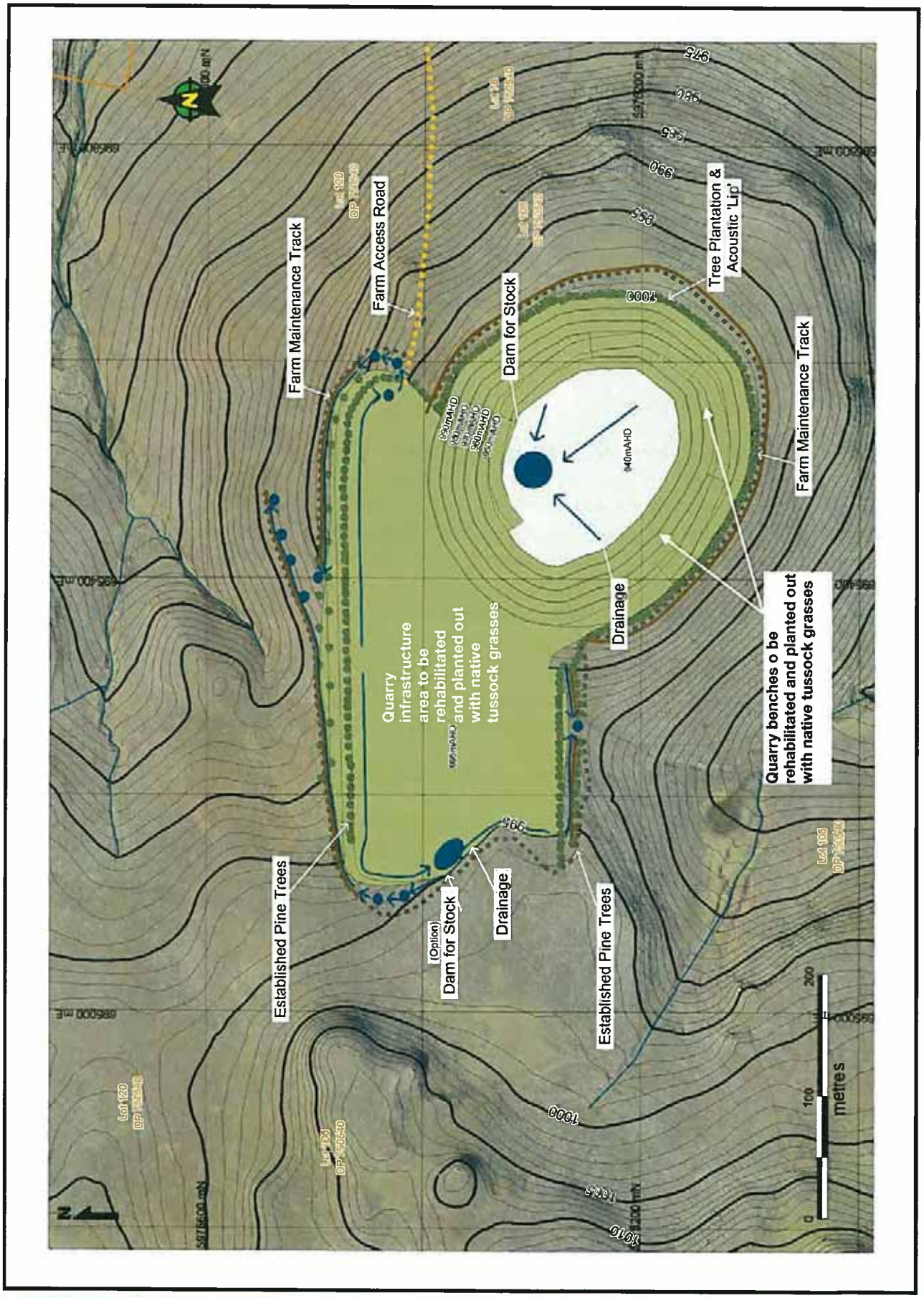


FIGURE 2.5: Rehabilitation of quarry *(Source: Tanand 2017)*

Revegetation of these areas would have the following central aims:

- Establishment of initial vegetation cover using native grass seeding and pine trees.
- Implementing erosion and sedimentation controls at the base of the overburden emplacement and bunded areas.
- Native tussock grasses are planted for soil stabilisation purposes, while appropriate weed management practices would be incorporated into the development.

Earthworks treatment

The top of the bunds/overburden emplacement areas, located to the north and south of the active quarry, will be worked such that wherever possible they drain back towards the active quarry area, and not drain off-site. Topsoil material for revegetation and stabilisation of these areas within the working quarry area is to be sourced from soil and overburden stored on-site which has been stockpiled as part of the initial clearing and soil removal process.

Stable final quarry profile

The relevant guidelines note that the primary aim of the closure and rehabilitation phase of a quarry is to minimise long-term erosion through effective revegetation. Revegetated areas should be carefully managed for a number of years after the initial rehabilitation works, with intensive management over the first few months. This is to promote vegetation growth and development, and address any problems arising with vegetation establishment. (source: *Managing Urban Stormwater: Soils and Construction, Volume 2E Mines and Quarries* (DECC, 2008). When completed, the quarry pit will be a large excavation into the ground. It is both desirable and necessary that it be left in a healthy, rehabilitated and safe condition. The progressive rehabilitation measures, together with final works, will ensure that both vegetation regrowth and overall safety measures have been satisfactorily undertaken.

The final land surfaces will be partly reshaped to stable landforms. This will involve reworking the existing worked quarry infrastructure area and pit to achieve slopes which are structurally stable. The stability of the quarry and surrounding areas would continue to be monitored during the project, to ensure a safe work environment.

Maintenance of rehabilitated areas, pine tree plantings

The rehabilitation process will commence from initial site establishment, and will be ongoing. All rehabilitated areas will be maintained by site personnel until the vegetation is well established. Regular inspections shall be carried out to monitor the progress of rehabilitation and identify areas that require maintenance. This maintenance activities to be carried out with the working quarry area will include soil erosion control, control of noxious and environmental weeds, fencing repairs for access control, feral pest control, and bushfire hazard management.

Revegetation

The Project Site has a low agricultural suitability. The objective will be to revegetate the site with open grassland, suitable for grazing purposes. This revegetation strategy applies consistently to all areas disturbed by quarry activities, including the quarry overburden emplacement/bunded areas, as well as areas used for stockpiles and quarry crushing plant. The rehabilitation program will be to re-introduce open improved grassland as currently found on the Project Site. Revegetation of all previous disturbed areas within the approved quarry area will be undertaken using appropriate seed and fertiliser mixes to achieve a suitable and sustainable grass/pasture cover on the revegetated land surface. Once quarrying is completed on site, the basin in the quarry pit (and potentially the working quarry area) will be retained, to aid in watering of stock, as well as a source of water to aid in the timely regeneration of tussock grass vegetation in all proposed rehabilitated areas.

During the life of the quarry all bunds and similar emplacements are to be revegetated and maintained, in order to reduce erosion potential and to assist in providing an enhanced visual screening of quarry operation from nearest residences to the north and to the south. Existing tree plantings will also be retained.

Weed control

Declared plants, environmental weeds and animal pests are to be controlled in accordance with best practice land management practices. At the end of quarrying operations all declared weed spaces will be eradicated.The quarry operator will be responsible for the control or eradication of noxious weeds in and around the quarry site. The quarry operator is familiar with noxious weed controls are the nearby Nimmitabel quarry site and regularly inspects the site for the presence of noxious weeds. Weed control measures are to be employed at regular intervals or as required.In summary, the following are to be taken to minimise the risks arising from rehabilitation, both during and after quarrying the site- refer Table 2.11, as well as Section 5.3.15 of the EIS for further details regarding the flora and fauna mitigation measures proposed.

Table 2.11: Quarry rehabilitation practices & mitigation measures

Rehabilitation issue	Proposed rehabilitation practice/mitigation measure
Planting	The collection of ground cover seeds prior to clearing in the quarry and stockpile/ processing portions of the project site. Once quarrying is complete, revegetate the site with open native tussock grassland, currently used for grazing purposes. Retain existing stands of perimeter pine trees planted out during the life of the quarry. Supplementary watering of newly planted areas undertaken when required
Weed control, stabilisation works on bunds and emplacement areas	Remove weeds and/or prevent from spreading. Maintain stable shape to overburden emplacement area, in order to reduce erosion potential. Use earthmoving equipment to progressively shape and trim the workings to the stable profile. Maintain sediment fencing at the base of the proposed bunds/overburden emplacement areas on the northern and southern perimeters of the quarry site, to control erosion and drainage impacts. Plant out bunds and mounds with native tussock grasses
Perimeter landscaping	Continue with plantings of pine trees from base of bunds/overburden emplacement area, to assist in providing an enhanced visual screening of quarry operation from nearest residences from the south and from the north
Access to the site	Access to the site to be restricted, to prevent the unauthorised access and disposal of material
Maintain basins/dams after quarrying is completed	Once quarrying is completed on site, the dams in the quarry pit and working quarry will be retained, to aid in watering of stock, as well as a source of water to aid in the timely regeneration of vegetation in all proposed rehabilitated areas
Monitoring, corrective action	Regular visual monitoring of fencing, inspection of planted/rehabilitated areas will be undertaken by the quarry operator to determine the need for maintenance works (fertilising, weed control, erosion repair or control works, thinning of plants, pruning) and replacement of failed plantings.Regular visual monitoring of fencing, inspection of planted/rehabilitated areas will be undertaken by the quarry operator to determine the need for maintenance works (fertilising, weed control, erosion repair or control works, thinning of plants, pruning) and replacement of failed plantings
Use of topsoil, rocks	Collection and re-use of surface rock material, including on the bunds- to provide additional habitat for the Striped Legless Lizard; and in rehabilitation areas- to provide supplementary habitat on the subject land. Enhance habitat further from the quarry site (ie downslope from the existing known location of the Striped Legless Lizard) by the placement of additional stone and rock removed from the quarry operations footprint

2.4 Justification for the Project

2.4.1 Summary

This project, if approved, will provide a long-term, high quality supply of hard rock material into the local and regional markets. Approval of this resource is needed to replace supply from Schmidt Quarries' existing quarry that is nearing the end of its economic life.

Schmidt Quarries needs to replace its existing quarry at Nimmitabel, where the resource is almost exhausted- it too being a volcanic plug, similar to that now proposed to be extracted on the Project Site. The Rock Flat quarry site has been identified as a high quality volcanic rock well suited to aggregate production and other similar quarry products. Approval of this new quarry will enable Schmidt Quarries to continue to operate as a reliable, environmentally responsible supplier of quarry products to the region to meet the expected ongoing demand for quarry products region. The Project will provide ongoing direct employment for approximately 6 people at the Nimmitabel Quarry, as well as flow-on employment for comparators and others in allied industries.

The proposed new quarry seeks to extract rock from a volcanic plug, an artefact of past volcanic activity in the Monaro region.

The project involves the operation of a new quarry designed to ensure that environmental impacts are reduced as much as practicable, with the impact assessment contained in this Environmental Impact Statement (EIS) demonstrating that the project complies with relevant planning and environmental legislation, and government planning policies and guidelines.

The quarry site meets many key environmental and operational requirements in terms of:

- Ease of access to a major road (Monaro Highway) and proximity to local markets.
- Good setbacks from existing rural residences.
- The proposed new quarry being visually concealed from neighbours and from the Monaro Highway.
- Small environmental footprint of the proposed quarry. The quarry resource is a volcanic plug. The extraction of the volcanic rock is proposed over a relatively small footprint, with extraction to occur at depth, following the volcanic plug, with the quarry itself set back from local watercourses. The combined effect of this Project is to achieve maximum efficiency of extraction with least environmental disturbance.
- Quarry deposit of suitable size and quality to meet the known needs of markets in the region.
- The Applicant's experience and good environmental track record in carrying out extraction operations from a volcanic plug resource, similar to that on the project site. The Applicant's Nimmitabel quarry operation is currently working a volcanic plug, similar to the one proposed to be worked at the Project Site. Schmidt Quarries intend to apply similar sound, proven quarry management measures to the project site as are currently being applied at the Nimmitabel quarry. The Project will incorporate the same quarry management principles including the method of extraction of this existing volcanic plug resource, scale of quarrying operations, provision for landscaped buffer strip plantings *in and around* the active quarry area, control of dust emissions, provision for on site stormwater controls and sediment basins, traffic generation, and rehabilitation of the quarry once quarrying is completed.

The Project will support the planned future growth of surrounding region, including major highway infrastructure projects as well as allied markets and users.

2.4.2 A Valuable Quarry Resource

Drilling investigations of the site by Schmidt Quarries have been undertaken, with drill holes scattered across the quarry site, sufficient to determine the broad area of the resource, with follow up petrographic analysis to confirm the quality of the volcanic resources at the site. These investigations informed the proposed quarry plan.

Extractive industry development can only occur in locations where the hard rock resource occurs naturally. The Project seeks to utilise a known high quality hard rock resource.Hard rock quarries are a vital component of any local or regional economy. The industry not only supports jobs directly; it also supports jobs in other sectors of the economy such as transport, processing of extractive materials, building construction for housing and tourism development, and construction of local roads and subdivision roads.

The quarry resource to be won can service demand for quarry products used in a wide range of uses, including road construction and associated uses - refer to Section 2.2 for details. All of these materials are becoming increasingly scarcer as the region's existing hard rock resources are progressively depleted. It is important to note that aggregate is, ideally, made from hard, fine-grained rocks such as the volcanic rock found on the project Site. Other rock types, like shale and sandstone, are softer and of lower strength, and are of lesser usefulness, suited only as low-grade road base and as fill.

Volcanic rock of the type encountered on the Project Site is well suited as a reinforcement to concrete and is capable of producing a full range of high quality quarry products. It exhibits more jointing than other rock types it requires less energy to extract, crush and process the rock into various product types. It also has the advantage of not containing deleterious material like silica or asbestos, unlike other hard rock types. It is because of the above features that this hard rock resource is such a highly sought after quarry resource.

The quarry is strategically positioned in terms of ability to service the region. The proposed development will allow this valuable resource to be extracted from a site where the potential environmental impacts can be satisfactorily minimised.

2.4.3 Economic, Social and Environmental Justification

This project, if approved, will provide a long-term, high quality supply of hard rock materials into nearby markets and neighbouring major infrastructure projects. It will also maintain local employment opportunities and assist local and regional economies through the supply of cost effective, high quality construction and road building materials to the broader community. The proposed quarry has been designed to ensure that environmental impacts are reduced as much as practicable, with the impact assessment contained in this EIS demonstrating that the project complies with relevant legislation, government policy and guidelines.

The Project will provide direct employment for up to 6 people at the quarry, and flow-on employment for an estimated 6 people off-site and security of employment for personnel currently working in Schmidt Quarries' existing Nimmitabel quarry operation business. [NOTE: The existing workforce at Nimmitabel Quarry will be relocated to the Project Site once quarrying ceases at Nimmitabel. Approval for the Project is critical for the maintenance of this current quarry workforce].

The Project will also provide major economic benefits in the form of annual operating expenditure of up to $2.5 million (excluding truck drivers salaries). This includes expenditure on fuel, repairs and maintenance, salaries and wages, payment of State and Commonwealth taxes and fees. Gross wages and salaries is likely to be in the region of $0.6 million for on site employees, and $0.7 million for the company's truck drivers. Estimated average gross income from quarry sales is likely to be up to approximately $4.2 million per annum.

2.5 Alternatives

2.5.1 No Quarry Option

If the proposed quarry does not proceed the following impacts are likely:

- By 2019 the closure of the Nimmitabel quarry without a replacement quarry being available.
- A loss of an immediately and readily accessible source of quarry products capable of serving both regional markets as well as major road infrastructure projects.
- A loss of jobs associated with the current Nimmitabel quarry operation, in terms of direct employment of staff and contractors, as well employment and economic multiplier benefits extending to the broader community. The Nimmitabel quarry is a viable industry in a rural area.
- Earlier completion of rehabilitation- however, the beneficiaries will be limited to the owners of the quarry.
- No quarry truck traffic on the local roads.
- The need for the establishment of an alternate quarry elsewhere in the LGA. The proposed quarry contains a valuable resource that is considered to be of a strategic importance in the LGA as many quarries in the region have either limited available resources or are constrained by environmental considerations or potentially involving a lower quality hard rock resource. Moreover, the quarry site is strategically located in terms of proximity to major users of quarry products, such as the Boco Rock Wind Farm.

2.5.2 Alternative Quarry Sites, Cumulative Impacts

The existence of the volcanic plug defines the quarry resource. There are very few volcanic plugs in the region that are capable of being worked as a quarry. For instance, the Brothers are also volcanic plugs, however, their visual prominence would preclude these landforms from ever being considered for quarrying.

Positive cumulative benefits would result from the development of the quarry in that it would benefit the need for high quality quarry product to service infrastructure and allied projects in the region.

The screening effect of proposed trees plantings and topographic barriers will obscure or significantly screen views of the quarrying operations from nearby residential areas and from the highway. With these measures in place, the proposal would not result in or contribute to a significant cumulative impact in terms of visual and landscape amenity. Hard rock quarries are a vital component of the local and regional economy. Local employment benefits are likely to accrue from allowing the proposed development to proceed.

Potential cumulative impacts are addressed further in Section 5 of the EIS.

2.5.3 Quarry Design Alternatives

The location of the volcanic plug has determined the location of the quarry operation. The need to screen the quarry operations from key vantage points in the locality on grounds of visual impact as well as noise impacts has dictated the design of the quarry and proposed extraction operations from the back of the hill, minimising visual and noise impacts.

Safeguards have been incorporated into project design to either eliminate, or reduce to acceptable levels, any likely environmental impacts. The main impacts and safeguards relate to:

- Ensuring that no significant adverse visual impacts arise, either in the short term or the long term.
- Noise, blasting and dust will be effectively controlled.
- Rehabilitation and revegetation of worked areas.
- Effective water management measures to be implemented.
- Minimal impacts on natural habitats. The design of the quarry haul route has been designed to avoid the habitat of threatened lizards. The proposed haul route at the base of the ridge has been relocated into improved pasture to avoid habitat for the Grassland Earless Dragon. Access Option 2, involving the relocation of the access onto the Monaro Highway, has been developed to avoid potential habitat for the Grassland Earless Dragon, involving direct access from the rail crossing to the Monaro Highway. [NOTE: Option 2 has been developed based on one sighting near the highway proximate to- but not on- the route associated with the Access Option 1 route]

Applying the safeguards proposed, the proposed quarry can be conducted within acceptable environmental parameters.

3.Statutory Planning Context

The following section identifies relevant State and Commonwealth planning and environment legislation and discusses the application of these planning provisions to the Project.

3.1 Environmental Planning & Assessment Act 1979

3.1.1 Overview

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) governs planning and the assessment of development projects in New South Wales, including quarries ('extractive industries' as defined). This planning legislation is administered by Department of Planning & Environment and by local councils- in this instance Snowy Monaro Regional Council being the relevant local council. The quarry project the subject of this EIS is considered to be consistent with the objects of the EP& A Act, as summarised in the following Table 3.1.

Table 3.1: Checklist of the Project against objects of EP&A Act 1979

Objects	EIS Coverage
"(a)(i) 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,"	The Project aims to adhere to 'best practice' on-site quarry management strategies and measures that will promote social and economic benefits to the local and regional economy, at the same time as minimising impacts on the natural environment, local amenity, the water resources of the locality and agriculture
"(ii) the promotion and co-ordination of the orderly and economic use and development of land,"	The project promotes the orderly and economic use of the hard rock resource at the same time as being compatible with the surrounding agricultural land uses of the local area
"(iii) the protection, provision and co-ordination of communication and utility services,"	Satisfactory impacts
"(iv) the provision of land for public purposes,"	Not applicable.The project is located on privately owned freehold land and it is not proposed that it be provided for public purposes
"(v) the provision and co-ordination of community services and facilities, and"	Not applicable
"(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species and ecological communities, and their habitats, and"	The project is considered unlikely to result in any significant impact to any threatened species, populations or communities. Sufficient safeguards have been put into place to ensure that this outcome will occur
"(vii) ecologically sustainable development, and"	Refer Section 4.1.3 of this EIS for details regarding compliance with this object of the EP&A Act
"(viii) the provision and maintenance of affordable housing, and"	Not applicable
"(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and"	The Project accords with relevant State, regional and local environmental guidelines and planning controls
"(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment."	The EIS has been prepared following discussions with local and state government, and local residents, in accordance wit the requirements of the SEARS

In addition to the above, the Project is considered to be consistent with the following relevant objects contained in section 1.3 of the *Environmental Planning and Assessment Amendment Bill 2017*, passed by NSW Parliament on 15 November 2017, yet to be assented to:

- The Project will result in the proper use of the natural resources known to underly the site (Object (a)).
- The Project will further the principles of ecologically sustainable development (Object (b)), addressed under a later heading.
- There is minimal likelihood of adverse impacts on "threatened ecological community" (TEC) or"endangered populations", thus satisfying Object (e) namely: *"(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats."*

The provisions of Part 4 of the EP&A Act determined the planning process for the proposed quarry at Rock Flat comprises 'designated development' under the EP&A Act, requiring the preparation of an EIS.

3.1.2 Section 79C Matters

Section 79C of the EP&A Act requires that a variety of matters be taken into consideration when determining a development application. A checklist of these matters and where they have been addressed in the EIS is outlined in the accompanying Table 3.2.

Table 3.2: Section 79C Checklist

Matters for Consideration s.79C	Relevant EIS Section
(a) The provisions of: **Any environmental planning instrument**	Refer to Section 3 & Section 5.2
Any proposed planning instrument	Not applicable. Refer Section 5.2
Any development control plan	The applicable development control plan is Cooma-Monaro Shire Development Control Plan 2014 (Amendment 1). Refer Section 3.3
Any planning agreement or draft planning agreement that has been entered into under section 93F	No planning agreements have been entered into under s.93F
The regulations (to the extent that they prescribe matters for the purposes of this paragraph)	Refer to Section 3 & Section 5.2
Any coastal zone management plan	Not applicable
(b) The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality	Refer Section 5 in conjunction with Section 2- the latter containing details of quarry mitigation measures proposed
(c) The suitability of the site for the development	The location of the quarry is determined by the presence of the resource of a quality to warrant extraction. It is considered that the project site is suitable for the proposed quarry and that the proposal has been designed having regard to the constraints of the site. Considered further in this EIS report. Refer also to Section 5.2 of the EIS
(d) Any submissions made in accordance with this Act or the regulations	Comments to be received during the EIS exhibition process
(e) The public interest	Refer Section 5.2

3.1.3 Sustainable Development

The principles of ecologically sustainable development (ESD) are an element of the public interest which is a mandatory consideration. [NOTE: formerly a specific requirement for an EIS to address in Item 6 of Schedule 2, clause 72 of the *EP&A Regulation*, since repealed]. These are considered in the following.

- **The precautionary principle:** Only activated if there are threats of serious or irreversible environmental damage and lack of full scientific certainty. If both elements are established, the precautionary principle applies- *Telstra Corporation Ltd v Hornsby Shire Council [2006]* NSWLEC 133 Preston CJ. In the case of the Project, there are no serious or irretrievable impacts likely and certainty regarding acceptable impacts arising from the proposed quarry. The environmental investigations undertaken during the preparation of this EIS have identified potential impacts with adequate scientific certainty to justify proceeding with the proposed development. Moreover, it is considered that the Project strikes a balance between the orderly and economic use of the land, including the extraction of the valuable hard rock resource that it contains, and the protection and conservation of the environment and surrounding rural landscape of the Monaro Plain.

The proposal has adopted precautionary approach to key aspects of the quarry development. The quarry design process and mitigation measures proposed to prevent or limit the potential for environmental harm associated with the operation of the proposed new quarry. In this regard the Project incorporates environmental management measures similar to those currently adopted at the Applicant's Nimmitabel quarry operations. Adopting proven quarry management measures that have been been shown to have worked on a similar hard rock deposit nearby means that there can be a greater confidence in predicting that there will be minimal adverse impacts on the local environment, including air, noise and vibration, as well as site rehabilitation- the latter to ensure the creation of a safe, stable final landform upon completion of quarrying at the site. There will be minimal potential for the generation of waste associated with the new quarry operation. This EIS has involved consultation with various government agencies, with inputs from specialist flora and fauna studies and environmental specialists, and the adoption of proven safeguards and management procedures (from Nimmitabel quarry, also operated by Schmidt Quarries, involving extraction from another volcanic plug) to prevent serious or irreversible degradation of the environment within and adjacent to the Project Site.

- **Inter-generational equity:** The Project has been designed to ensure that no part of the local community is unacceptably impacted upon or significantly disadvantaged as a result of the proposed new quarry development proceeding. The new quarry will provide quality processed hard rock material for local road making and other allied uses- a benefit which will apply to present as well as future generations. Moreover, other sustainable development projects in the region, like the Boco Rock Wind farm, have relied on locally available processed quarry rock for their operation. Wind farms generate a clean, renewable source of electricity and play an important role in reducing global greenhouse gas emissions.

- **Conservation of biological diversity and ecological integrity:** The majority of the proposed quarry site is grassland almost completely devoid of trees. The ecological studies have concluded that the land has no significance in terms of flora or fauna values. The proposed quarry is most unlikely have any significant adverse effect on local flora and fauna.Schmidt Quarries is committed to satisfactorily rehabilitating the site once quarrying has ceased.

- **Improved valuation, pricing and incentive mechanisms:** The value placed by Schmidt Quarries on the environmental resources of the Project Site, other than the volcanic rock resource, is evident through the quarry management and mitigation measures documented in this Environmental Impact Statement. The mitigation measures have been developed concurrently with the EIS assessment and have been incorporated directly into the final quarry design.

The proposal seeks to achieve non-material well-being or "quality of life" by ensuring that the general amenity of the local area is maintained throughout and beyond the life of the project through implementation of safeguard measures to mitigate any environmental impacts and progressive rehabilitation programs. It is considered that there are no irreversible features of the proposed new quarry development, with the exception of the depletion of a hard rock resource and longer-term removal of a small landscape feature from the Monaro Plain. Features of the local environment such as access, vegetation, views, water, soil resources and air quality are to be responsibly managed throughout the life of the new quarry project.

The following table summarises those matters relevant to a consideration of the principles of ESD applicable to the proposal.

Table 3.3: ESD Principles and the Project

Item	Assessment
Strategic, Town Planning issues	Permissible use under local Snowy Monaro Regional Council town planning controls (LEP). The EIS considers and complies with the objectives and provisions of various environmental planning instruments
Impacts on flora and fauna	All of the quarry site is grassland, not believed to be threatened. The quarry haul route has been re-designed to avoid the known habitats of threatened lizard species. As such, it is likely that there will be no significant impacts on flora or fauna
Likelihood of air or noise (including vibration, airblast) pollution	The quarry is buffered from surrounding residences by distance and topography, the knoll only clearly visible from one nearby residence, with the peak of this knoll only visible from another dwelling located more than 2km away. Blasting and noise impacts have been shown to be acceptable, within relevant environmental parameters
Impact on local health, local roads	No likely adverse impacts
Any hazards arising from the development	The proposed quarry is to operate from the site in accordance with stringent quarry management and mitigation measures, similar to those currently apply to Schmidt Quarries Nimmitabel quarry operations. The proposal seeks a continuance of these sound quarry management practices.
Visual impacts	The quarry is to operate from a hill for a significant part of the operation, with quarry operations located behind a knoll. Bunding and tree plantings proposed in the establishment phases of the quarry will further screen the quarry operations from view form vantage points nearby or from the Monaro Highway
Impact on agriculture	The quarry is to expand over generally steep, rocky terrain with generally low agricultural worth. Quarrying operations do not impinge upon any high quality agricultural land
Impact on soil erosion, watercourses	The design of the quarry is such as to confine any potential adverse impacts to within the quarry footprint. On site soil erosion and sediment management measures forms a key part of the quarry proposal
Impact on cultural significance	No likely impacts

Moreover, the proposed development complies with ESD principles in that:

- It seeks to rehabilitate the quarry, once quarrying is completed.
- It seeks to treat environmental management and rehabilitation on the site as integral component of the planning and operation of the quarry, based on sound quarry practices applied at Nimmitabel quarry.
- It seeks to adopt a transparent approach to environmental objectives and monitoring of works on the site.

The basic principles of Ecologically Sustainable Development have thus been satisfied in the development and assessment of the Project.

▪ 3.2 Cooma-Monaro Local Environmental Plan (LEP) 2013

3.2.1 Compliance with Cooma-Monaro LEP 2013

LEP Aims

The *Cooma-Monaro Local Environmental Plan LEP 2013* (LEP) is the comprehensive environmental planning instrument applying to the quarry site. The compliance of the proposed quarry development with the relevant aims of this plan are set out in the accompanying Table 3.4.

Table 3.4: Compliance of the Project with Cooma-Monaro LEP 2013 Aims

Aim	Assessment
"(a) to plan and manage for environmental sustainability"	The Project satisfies the principles of environmental sustainability. Refer section 4.1.3. No significant adverse visual, amenity, ecological or heritage impacts arise from the proposed development
"(b) to promote and coordinate the orderly and economic use and development of land"	The development of a quarry on the site will assist in the promoting the orderly and economic use of the known hard rock resource, and will enable Schmidt Quarries to relocate in an orderly manner from the nearby Nimmitabel Quarry to another nearby (volcanic plug) extractive resource. This will also encourage ongoing employment in the quarry industry. Furthermore, the quarry products derived from the quarry are important for the growth and development of the region
"(c) to provide clarity and certainty for the community regarding the future development of Cooma-Monaro, while allowing flexibility to respond to change,"	The Project adopts various planning and environmental controls that identify the factors that need to be considered when developing land for any land use. All relevant factors have all been duly considered in this EIS
"(c) to encourage opportunities for primary production in rural areas"	The proposed quarry development avoids productive agricultural land and does not involve the fragmentation of agricultural holdings.
"(g) to protect historic, environmentally significant and cultural sites and areas of quality visual amenity,"	No likely adverse impacts are predicted in this regard. The project is set well back from the Monaro Highway and from the identified scenic protection corridor running along the highway. Mitigation strategies are also proposed, to minimise any visual impacts associated with the quarry development, similar to those employed at the Nimmitabel Quarry
"(h) to encourage the siting and management of development to avoid, as far as practicable, conflict between adjoining and nearby land uses, both within and between zones having regard to likely future land uses"	The Project has been designed to minimise conflict with neighbouring use, in particular in terms of potential visual, noise and vibration impacts
"(j) to protect watercourses, riparian habitats, wetlands and water quality within water catchments."	The quarry project is set back more than 40m from local watercourses, with all runoff from quarrying confined to within the quarry site itself, avoiding impacts downstream. The quarry development is not within any riparian area, or any wetland or water catchment area

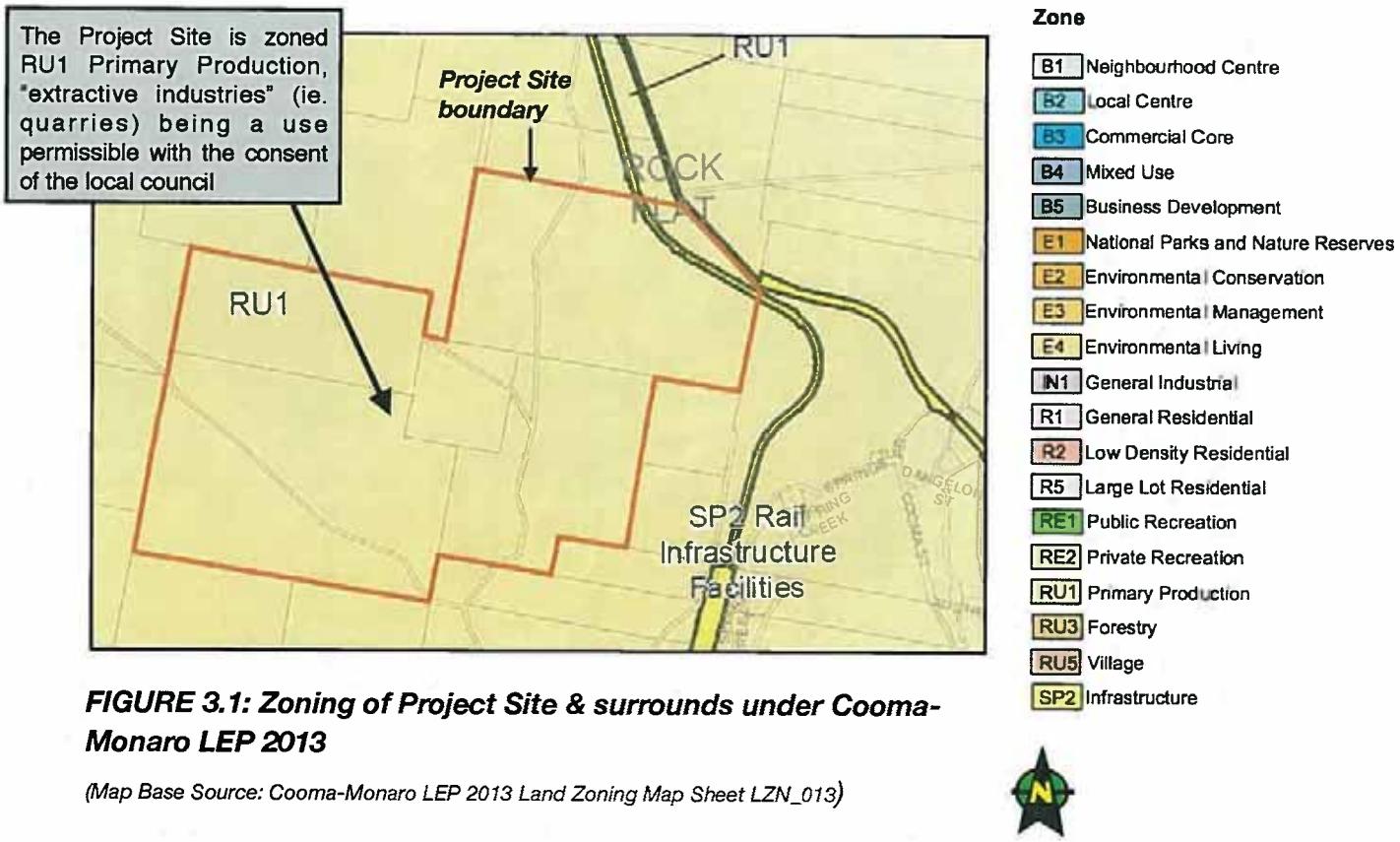


FIGURE 3.1: Zoning of Project Site & surrounds under Cooma-Monaro LEP 2013

(Map Base Source: Cooma-Monaro LEP 2013 Land Zoning Map Sheet LZN_013)

Zoning of the Project Site & RU1 zone objectives

The Project Site is zoned RU1 Primary Production under the provisions of the Cooma-Monaro Local Environmental Plan 2013 (LEP). 'Extractive industries', as defined, are a use specifically permitted in the RU1 zone. Refer **Figure 3.1.**

Under the heading "3 Permitted with consent" the Land Use Table for the RU zone allows the following uses:

> *"Building identification signs; Cellar door premises; Dual occupancies; Dwelling houses;* ***Extractive industries;*** *Farm buildings; Intensive livestock agriculture; Intensive plant agriculture; Office premises; Open cut mining; Roads; Roadside stalls; Rural workers' dwellings; Secondary dwellings; Any other development not specified in item 2 or 4"* [our emphasis]

The Dictionary accompanying the LEP defines 'extractive industries' as follows:

> ***"extractive industry*** *means the winning or removal of extractive materials (otherwise than from a mine) by methods such as excavating, dredging, tunnelling or quarrying, including the storing, stockpiling or processing of extractive materials by methods such as recycling, washing, crushing, sawing or separating, but does not include turf farming."*

The compliance of the quarry project with the objectives of the RU1 Primary Production zone are set out in the following Table 3.5.

The disused rail line is zoned SP2 Rail Infrastructure Services. Notwithstanding the land use table contained in the LEP, rail crossings associated with a quarry operation is permitted pursuant to the provisions of *State Environmental Planning Policy (Infrastructure) 2007*. The land containing the highway is zoned SP2 Classified Road.

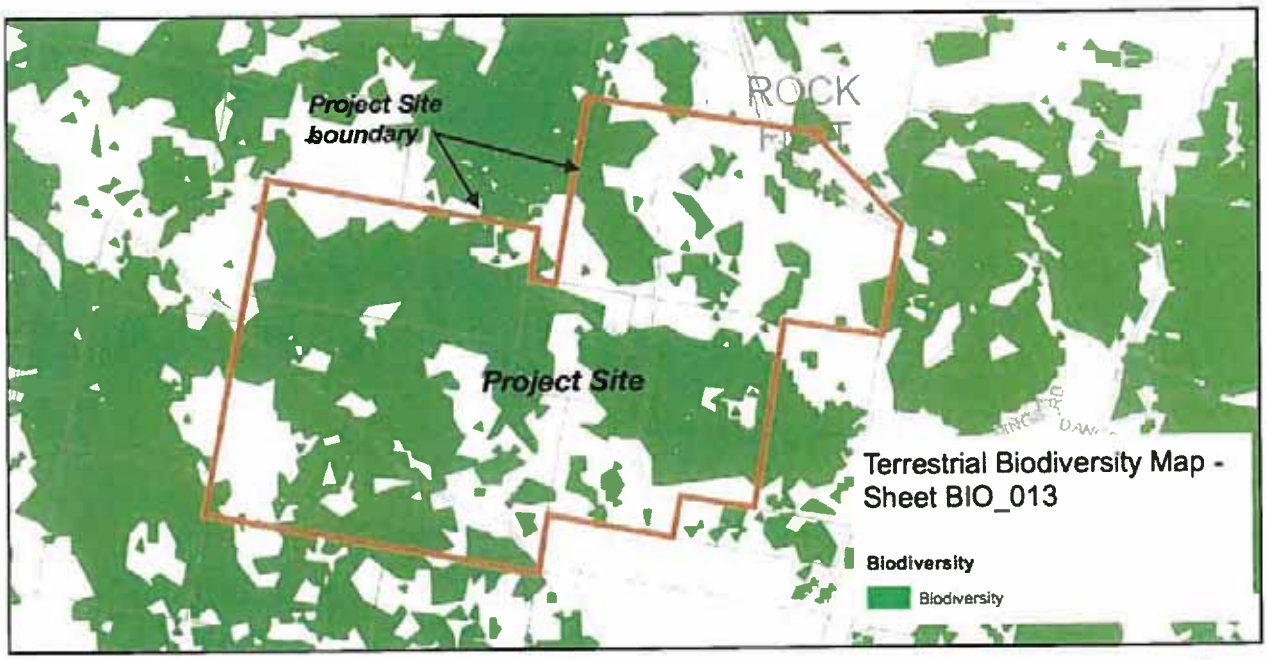


FIGURE 3.2: Cooma-Monaro LEP 2013 Terrestrial Biodiversity Map

(Map Base Source: Cooma-Monaro LEP 2013 Terrestrial Biodiversity Map Sheet BIO_013)

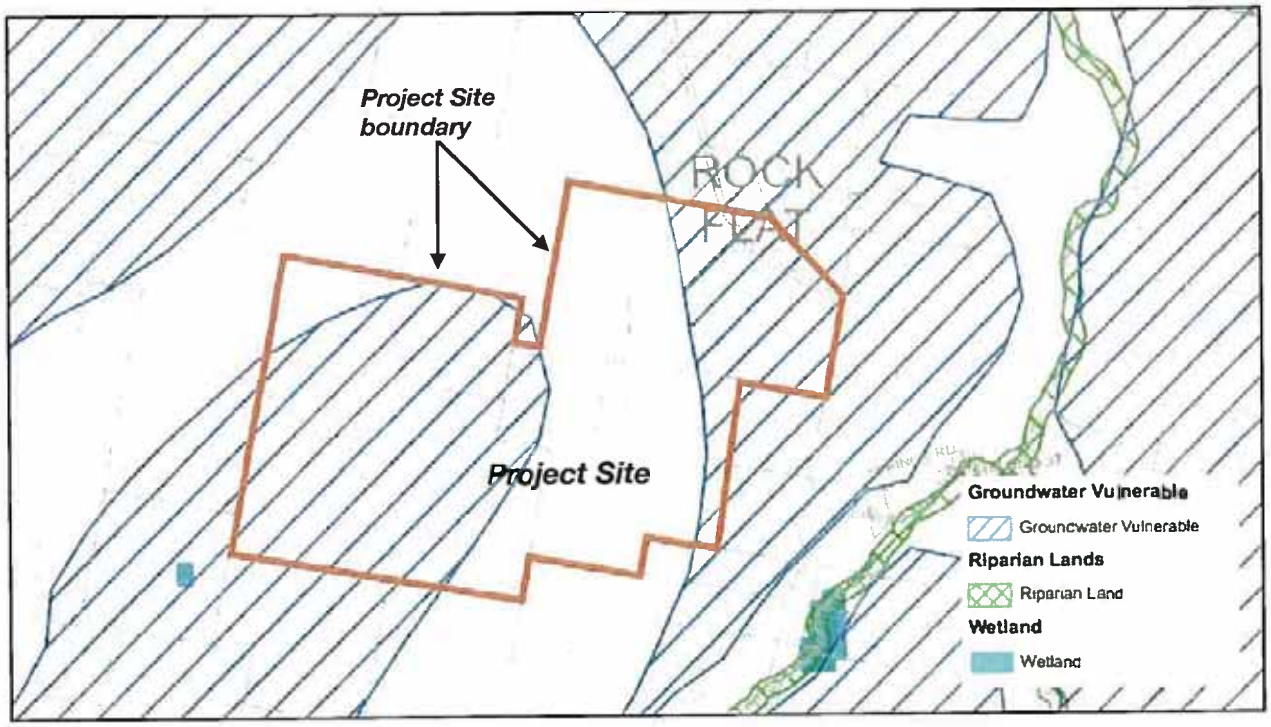


FIGURE 3.3: Cooma-Monaro LEP 2013 Groundwater Vulnerability Map

(Map Base Source: Cooma-Monaro LEP 2013 Groundwater Vulnerability Map Riparian Land Map Wetlands Map Sheet CL1_013)

Table 3.5: Compliance of the Project with RU1 Zone Objectives

RU1 Zone Objectives	Compliance
"To encourage sustainable primary industry production by maintaining and enhancing the natural resource base"	Quarries form an important part of the resource base of any local area. The quarry expansion proposed will increase access to a known hard rock resource
"To encourage diversity in primary industry enterprises and systems appropriate for the area"	Not applicable to the project
"To minimise the fragmentation and alienation of resource lands"	The proposed quarry development does not involve the fragmentation and alienation of resource lands. In fact, it seeks to expand an already approved quarry in order that there is increased access to the hard rock resource known to underlie the site
"To minimise conflict between land uses within this zone and land uses within adjoining zones"	The quarry is sufficiently buffered from neighbouring residential land uses and from lands used for agriculture. The proposed quarry project can go ahead without detriment to or conflict with the surrounding neighbourhood
"To encourage land uses that are unlikely to generate significant additional traffic relative to the capacity and safety of a road, or create or increase a condition of ribbon development on any road."	The quarry project will generate quarry truck movements the are capable of being accommodated on the regional road system (ie. Monaro Highway). A satisfactory upgrade of the intersection of the internal quarry haul route with the highway is proposed.
"To encourage land uses that are unlikely to create unreasonable or uneconomic demands for the provision or extension of public amenities or services."	The quarry project will not result in any unreasonable or uneconomic demands for the provision or extension of public amenities or services. No reticulated town water or sewerage services are required to service the quarry development.
"To protect the water quality of receiving watercourses and groundwater systems"	All stormwater runoff from within the active quarry area is to be detained on site by sediment basins, with no off-site runoff. The quarry is unlikely to affect local groundwater resources
"To protect the visual landscape values of the rural area."	The quarry is well set back from scenic protection corridor running parallel with the highway. The volcanic plug containing the resource is a low hill of local visual prominence. Measures are proposed to further mitigate any visual impacts associated with the Project

Other LEP mapping provisions

The Project Site is also subject to additional LEP mapping, as follows:

- Terrestrial biodiversity mapping. Refer Figure 3.2.
- Groundwater vulnerability. Refer Figure 3.3.
- Scenic protection- but only lands in the corridor running parallel to and proximate to the Monaro Highway. Refer Figure 3.4.
- Landslide risk.

The mapping associated with the above is discussed in the following.

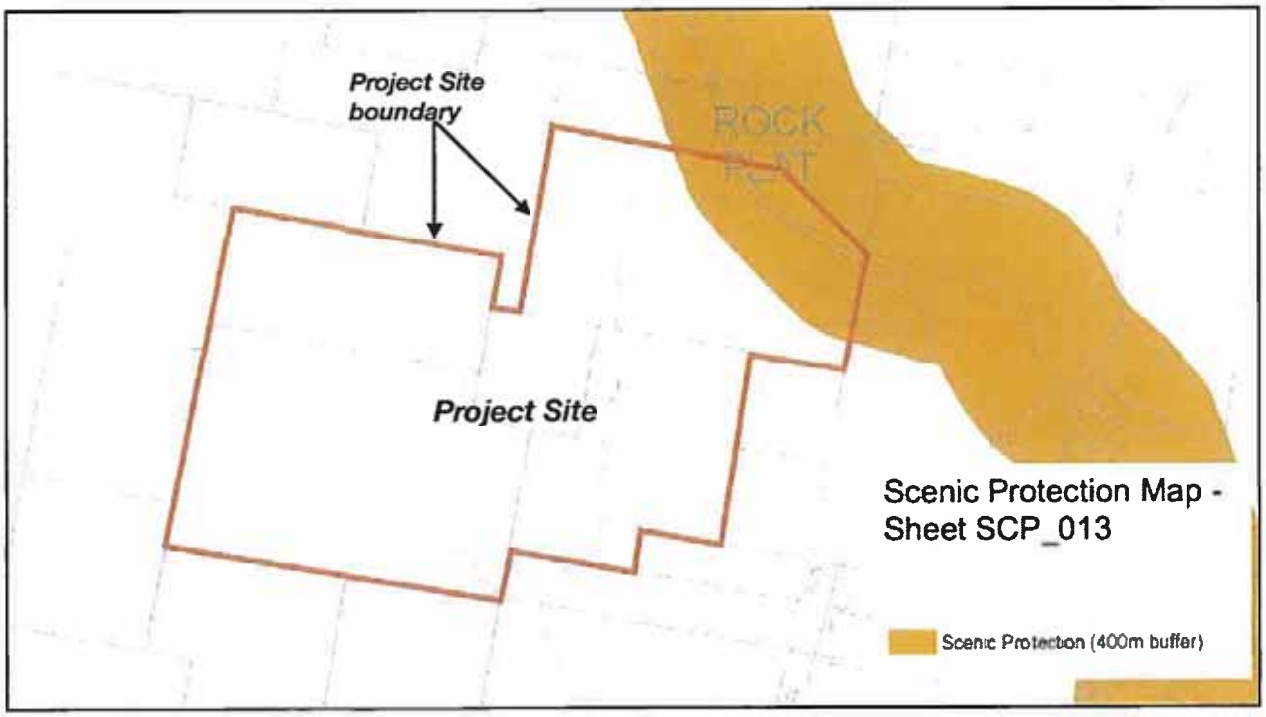


FIGURE 3.4: Cooma-Monaro LEP 2013 Scenic Protection Map

(Map Base Source: Cooma-Monaro LEP 2013 Scenic Protection Map Sheet SCP_013)

The biodiversity significance of the Project Site is assessed in detail in the Gunninah ecological report accompanying this EIS. The potential for groundwater is assessed in detail in the Geolyse report accompanying this EIS.

No part of the proposed quarry extraction area or processing area is within the 400m wide corridor lands marked 'on the LEP map (below) as 'Scenic Protection'. The visual significance of the site and surrounds is assessed in the visual impact assessment sections of the EIS.A small area on the southern side of the volcanic plug is classified under the LEP as comprising land with 'landslide risk'. It is understood that this is because the land here has a slope of in excess of 18 degrees. However, because of the small patch of land so designated and given the sloping to undulating nature of the surrounding land here, this small area of steep land is unlikely to present any landslide hazard in itself. The remainder of the Project Site has been mapped as being free of any landslide potential.

In summary, the LEP mapping indicates that the area proposed for the quarry and associated stockpiles and the like is free from the following constraints:

- Drinking water catchment.
- Wetlands.
- Scenic protection.
- Riparian lands.
- Karst lands.
- Heritage-listed features, including Conservation Area, Aboriginal Place of Heritage Significance or Conservation Area- Landscape designations. Refer to **Figure 3.5**.

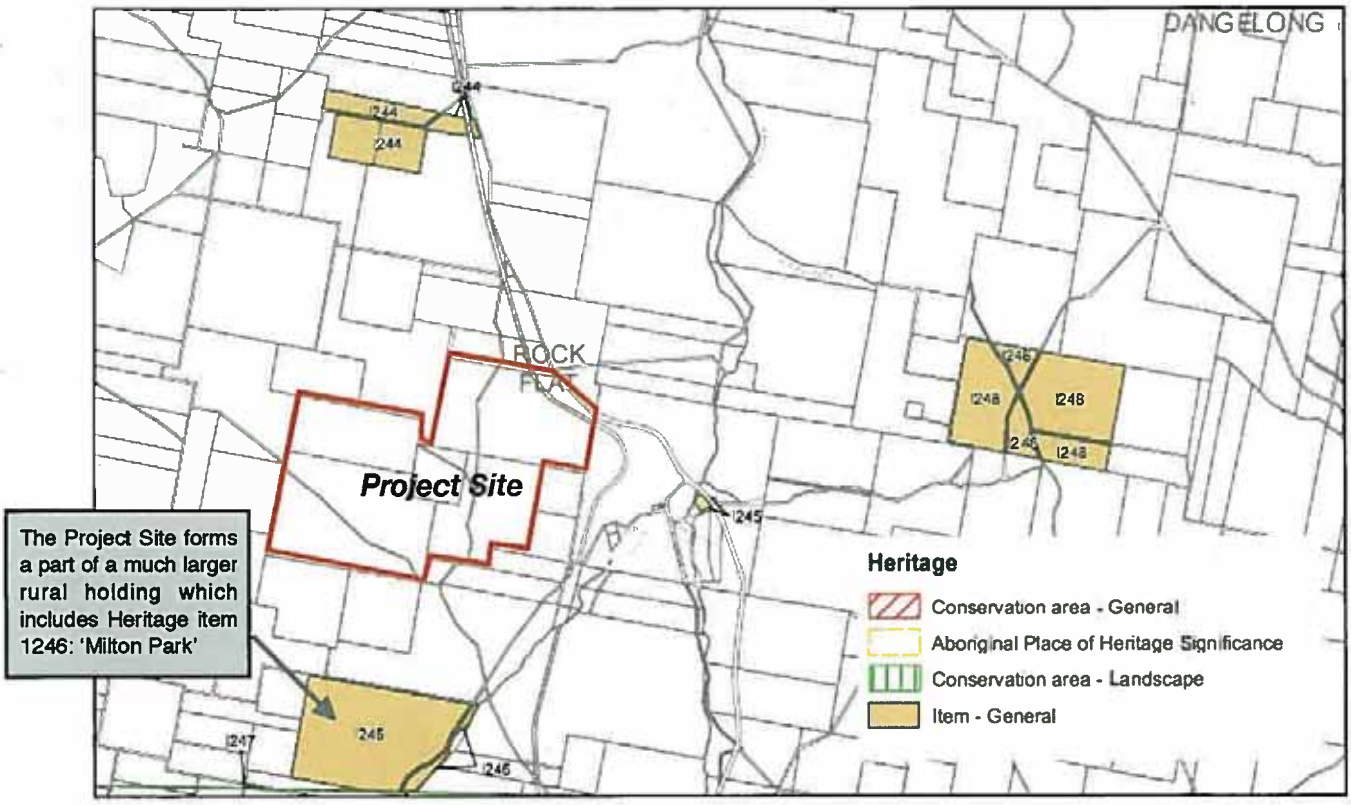


FIGURE 3.5: Cooma-Monaro LEP 2013 Heritage Map

(Map Base Source: Cooma-Monaro LEP 2013 Scenic Protection Map Sheet HER_013)

From Figure 3.5 the most proximate heritage features to the Project Site comprises the following:

- Heritage item 1246: 'Milton Park' Homestead, Lot 6 DP 750540 No. 278 Springs Road, Rock Flat. The proposed quarry site and processing plant site is not within view of this historic homestead, but parts of it are within view of lands within the homestead rural holding. This property is owned by the same owner as that of the Project Site, Mr Peter Devereux.

- Heritage item 1247: 'Rock Flat' Homestead, Lot 1 DP 750540 No. 470 Springs Road, Rock Flat. The proposed quarry site and processing plant site is not within view of this historic homestead, but parts of it are within view of lands within the rural holding.

- Heritage item 1245: Rock Flat Mineral Springs and Mine. Lot 49 DP 750537, near the intersection of Springs Road and the Monaro Highway, Rock Flat. The east face of the hill containing the resource is visible from the old mine.

- Heritage item 1244: 'Manaroo' Homestead, Lots 65,68 and 109 DP 750540 No. 7651 Monaro Highway. Refer **Figure 3.5**. The proposed quarry site and processing plant site is not within view of this historic homestead, but parts of it are within view of lands within the rural holding.

All of the above heritage items are of local significance only.

The following Table 3.6 summarises the compliance of the proposed modification with other relevant provisions of the Cooma-Monaro LEP 2013.

Table 3.6: Compliance of the Project with other provisions of Cooma-Monaro LEP 2013

Cooma-Monaro LEP 2013 provision	Compliance
Clause 1.9 Application of SEPPs	Various state environmental planning policies prevail over the LEP as provided by section 36 of the Act. In particular, the provisions *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* applies
Clause 5.1 Acquisition	No widening of the Monaro Highway identified in the LEP mapping near the site entry to the quarry- refer Cooma-Monaro LEP 2013 Land Zoning Map Sheet LZN_013 (Figure 31 of the EIS)
Clause 5.10 Heritage Conservation	No part of the project Site is listed as a heritage item. Refer accompanying Figure 3.5
Clause 6.1 Flood planning	This clause only applies to land identified as "Flood planning area" on the Flood Planning Map and any "other land at or below the flood planning level". The quarry site, including internal access route, is not identified as "Flood planning area" on the Flood Planning Map- refer Figure 4.3 of the EIS for excerpt
Clause 6.5 Essential services **"Development consent must not be granted to development unless the consent authority is satisfied that any of the following services that are essential for the development are available or that adequate arrangements have been made to make them available when required:** **(a) the supply of water,** **(b) the supply of electricity,** **(c) the disposal and management of sewage,** **(d) stormwater drainage or onsite conservation,** **(e) suitable road access."**	The quarry does not need any reticulated services to the site in order to operate. Electrical power for all quarry operations is to be supplied by diesel-powered generators, with the potential for connection to power once an office is erected on site. All stormwater runoff from within the active quarry area is to be detained on site by sediment basins, with no off-site runoff. The quarry has suitable access to the Monaro Highway via the proposed internal quarry access route

3.2.2 Council's Operational Plan 2018

The Snowy-Monaro Regional Council endorsed its Operational Plan in June 2017. This document identifies the priorities and aspirations of the Council and the community into the future. Some of the elements of this Plan, most relevant to the proposed quarry, are addressed in the following.

- The Project seeks to treat protect waterways (Objective 1.1).
- The Project seeks to protect local biodiversity and through rehabilitating the quarry on completion. Environmental management and rehabilitation on the site are integral components of the planning and operation of the quarry. Moreover, no species are threatened by the proposed new quarry (Objective 1.2, OP1.11).
- The Project seeks to have adequate and accessible transport connections (Objective 2.1).
- The Project seeks to encourage a strong, year round, economy (Objective 3.1).
- The Project seeks a development that is well-planned, efficient and sustainable that complements natural and cultural values (Objective 6.1).

3.3 State Environmental Planning Policies (SEPPs)

The following State Environmental Planning Policies apply in the Snowy-Monaro LGA. Their applicability to the proposed development is summarised in the table below:

Table 3.7: Applicability of the Project with relevant provisions of SEPPs

State Environmental Planning Policy	Summary of provisions	Applicability to proposed development
SEPP (Sydney Drinking Water Catchment) 2011	Applies to the Sydney Drinking Water Catchment	No. Project site does not form a part of this (or any other) drinking water catchment
SEPP (Exempt and Complying Development Codes) 2008	Streamlines assessment processes for development that complies with specified development standards. The policy provides exempt and complying development codes that have state-wide application, identifying, in the General Exempt Development Code, types of development that are of minimal environmental impact that may be carried out without the need for development consent	No. However, there is the ability to utilise this SEPP in the future eg. in construction of hardstand areas (exempt), certain types of earthworks or retaining walls (exempt), the installation of air conditioning units (exempt)
SEPP (Rural Lands) 2008	The aim of this policy is to facilitate the orderly and economic use and development of rural lands for rural and related purposes	Yes- rural planning principles still apply even though the Project Site is not designated as State Significant Agricultural Land and the Project does not involve a rural subdivision or a rural dwelling
SEPP (Infrastructure) 2007	Provides a consistent planning regime for infrastructure and the provision of services across NSW, along with providing for consultation with relevant public authorities during the assessment process	Yes. The proposed development will connect with a classified road. Consultation required with RMS pursuant to the provisions of clause 101 of the SEPP
SEPP (Mining, Petroleum Production and Extractive Industries) 2007	This Policy aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of the State	Yes
SEPP(Sydney Region Growth Centres) 2006	This Policy applies to growth centres around Sydney	No
SEPP (State and Regional Development) 2011	State significant extractive industries include development that: *"(a) extracts more than 500,000 tonnes of extractive materials per year, or* *(b) extracts from a total resource (the subject of the development application) of more than 5 million tonnes, or* *(c) extracts from an environmentally sensitive area of State significance."* [clause 7 of Schedule 1 of SEPP (State and Regional Development) 2011]	No. The project is not of a type or scale or location that triggers the relevant criteria for State development/ infrastructure

SEPP No.55 - Remediation of Land	Introduces state-wide planning controls for the remediation of contaminated land. The policy states that land must not be developed if it is unsuitable for a proposed use because it is contaminated	Yes, however, the contamination assessment contained in this EIS finds that the land is unlikely to contaminated land for the purposes of the SEPP
SEPP No. 44-Koala Habitat Protection	Encourages the conservation and management of natural vegetation areas that provide habitat for koalas	No. The Project Site is devoid of trees and potential koala habitat
SEPP No. 33- Hazardous & Offensive Development	The policy also requires specified matters to be considered for proposals that are 'potentially hazardous' or 'potentially offensive' as defined in the policy.	Yes. Assessed in this EIS
SEPP No. 30- Intensive Agriculture	Requires development consent for intensive cattle feedlots or piggeries	No

3.3.1 SEPP(State and Regional Development) 2011

State Environmental Planning Policy (State and Regional Development) 2011 is applicable to the whole of New South Wales (NSW).

Under the provisions of SEPP (State and Regional Development) 2011 extractive industries classified as "State significant development" for the purposes of this SEPP are as follows:

"7 Extractive Industries
(1) Development for the purpose of extractive industry that:
(a) Extracts more than 500,000 tonnes of extractive material per year, or
(b) Extracts from a total resource (the subject of the development application) of more than 5 million tonnes, or
(c) Extracts from an environmentally sensitive area of State significance."

The Project involves the extraction of up to 280,000 tonnes per annum from a resource of up to 4.6 million tonnes. Accordingly, the Project is not State significant development for the purposes of this SEPP. Nor is the project a 'regional development' for the purposes of clause 13 of *SEPP (Major Development) 2005*- clause 13C now repealed.

3.3.2 SEPP(Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 commenced on 1 January 2008. This SEPP is applicable to the whole of NSW, and includes provisions for consultation with relevant public authorities about certain development during the assessment process or prior to development commencing. Subdivision 2 of Division 17 to Part 3 of SEPP (Infrastructure) relates to development in or adjacent to road corridors and road reservations. As the site has frontage to Monaro Highway, which is an RMS classified road, clause 101 of the SEPP applies to the proposed development.

The SEPP sets out in Schedule 3 those traffic generating developments that need to be referred to the RMS- refer clause 104. "Extractive industries" are not specifically referred to in Schedule 3 of this SEPP, however, an enlargement or extension of "Industries" is subject to this planning provision. A traffic impact assessment forms a part of this EIS.

Subdivision 2, Division 15 of the Infrastructure SEPP sets out mechanisms for developments that are likely to affect rail corridors, relevant here because the proposed internal quarry haul route proposes to cross a rail line- all be it a disused rail line.

Clause 84 relevantly provides:

"84 Development involving access via level crossings

(1) This clause applies to development that involves:

(a) a new level crossing, or

(b) .....

(c) a likely significant increase in the total number of vehicles or the number of trucks using a level crossing that is in the vicinity of the development.

(2) Before determining a development application for development to which this clause applies, the consent authority must:

(a) within 7 days after the application is made, give written notice of the application to the chief executive officer of the rail authority for the rail corridor, and

(b) take into consideration:

(i) any response to the notice that is received within 21 days after the notice is given, and

(ii) the implications of the development for traffic safety including the costs of ensuring an appropriate level of safety, having regard to existing traffic characteristics and any likely change in traffic at level crossings as a result of the development, and

(iii) the feasibility of access for the development that does not involve use of level crossings.

....

(7) In this clause:

level crossing means a level crossing over railway lines.

traffic includes rail, road and pedestrian traffic."

The accompanying traffic report by Streetwise reviews the impact of the proposed development on the existing disused rail line, including provision for a new rail crossing, as well as traffic impacts generally. The traffic report concludes that the development will have acceptable impacts in terms of any effects on the rail line. Moreover, the Streetwise assessment concludes that the Project is not expected to result in traffic impacts that would adversely impact on the safety, efficiency or operation of Monaro Highway.

It is also relevant to note that the provisions of this SEPP make it possible for a determining authority to grant consent to a quarry development involving a rail crossing, despite the provisions of any LEP provision that may not allow it. In this regard Clause 8(1) of this SEPP confirms that the provisions of the SEPP overrides the effect of certain provisions of local environmental plans.

3.3.3 SEPP No. 14- Coastal Wetlands

This Policy is not applicable as the proposed quarry site is not within a designated coastal wetlands area.

3.3.4 SEPP No. 26- Littoral Rainforest

This Policy is not applicable as the proposed quarry site is not on, or within, the 100m buffer zone of any littoral rainforest.

3.3.5 SEPP(Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (the Extractive Industries SEPP) aims to ensure the sustainable operation and management of mineral, petroleum and extractive material resources. The Extractive Industries SEPP applies to the whole of New South Wales, and consolidates and updates many existing planning provisions related to mining, petroleum production and extractive industries.

It also introduced a number of new considerations which must be taken into account in the decision making process under the *Environmental Planning and Assessment Act 1979* (NSW).

The definition of "extractive industry" is set out in Clause 3 of the SEPP as "*means the winning or removal of extractive materials (otherwise than from a mine) by methods such as excavating, dredging, or quarrying, including the storing, stockpiling or processing of extractive materials by methods such as recycling, washing, crushing, sawing or separating*". The SEPP provides controls and guidelines for various categories of mining, petroleum production and extractive industries activities in NSW which are permissible with and without development consent. These provisions, together with a clause which overrides the effect of certain provisions of local environmental plans, will ensure consistency across al local government areas as to when development consent is and is not required. The aims of the Mining SEPP are set down in clause 2, which states:

> *"2 Aims of Policy*
> *The aims of this Policy are, in recognition of the importance to New South Wales of mining, petroleum production and extractive industries:*
> *(a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and*
> *(b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and*
> *(c) to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment and sustainable management, of development of mineral, petroleum and extractive material resources."*

The Extractive Industries SEPP requires that determining authorities consider the following when assessing any application for such development including:

- The compatibility with surrounding land uses. The Extractive Industries SEPP requires the consent authority to consider the likely impact of any new mines, petroleum or extractive industry proposals on current and future surrounding land uses, and to have regard to 'land use trends' so as to identify the likely preferred uses of land in the vicinity of the development. The Project Site is located in a sparsely populated rural area with a low agricultural suitability. Assessed elsewhere in this EIS document. Impact assessments for noise, air quality and transport have been conducted for the Project and have concluded that there would be no significant additional impacts on adjoining land uses in the vicinity of the Project development areas. The Project is compatible with existing, approved or likely adjoining land uses. The Project would be operated in such a way as to minimise any potential local amenity impacts,

- The environmental impacts of the proposal, including impacts on significant water resources and impacts on threatened species and biodiversity. The Project would be operated in such a way as to minimise any potential environmental impacts, as detailed elsewhere in this EIS. The SEPP also requires the consent authority to consider an assessment of the greenhouse gas emissions (including downstream emissions) of the development. These matters are assessed elsewhere in this EIS document. Satisfactory impacts are predicted to ensue.The Project is an employment generating development which is proposed to replace an existing quarry operation at Nimmitabel. The ongoing employment of a skilled quarry workforce in the area would result in socio-economic benefits to the local and regional economies in terms of employment and expenditure.

- The efficiency of resource recovery. The quarry plan aims to maximise the efficient recovery of the hard rock resource at the Project Site, the volcanic plug confined to a relatively small footprint.

- The implications of the development on the public roads network. Satisfactory impacts are predicted to ensue. Further considered in Section 5 of this EIS document.

- The rehabilitation of the land, including final landforms. Described and assessed elsewhere in this EIS document. Refer to Section 2 (in particular Section 2.3.13) of the EIS for details of the rehabilitation proposed and Section 5 for the impact assessment.

- To encourage ecologically sustainable development through the environmental assessment, and sustainable management of extractive material resources. The proposal complies in this regard. The quarry will be operated in an environmentally sustainable manner. Assessed elsewhere in this EIS document, in particular, Section 3.1.3.

The compliance of the proposed development with other relevant parts of this SEPP are further assessed as follows.

The Extractive Industries SEPP contains a specific provision, clause 5, that deals with the relationship of this SEPP with other environmental planning instruments. This provides, relevantly, that if this Policy is inconsistent with any other environmental planning instrument, whether made before or after this Policy, this Policy prevails to the extent of the inconsistency. The consequences of this provision, as well as clause 8 of the Extractive Industries SEPP, exclude from consideration any otherwise relevant provisions of any local council LEP or DCP that are inconsistent with the SEPP. Stated another way, the terms of the SEPP are intended to exclude consideration of the zone objectives (and any other inhibitory provisions) of any LEP or DCP in their entirety.

The assessment framework that Schmidt Quarries will be required to follow in this case of the proposed quarry is as set out in clauses 7, 12, 13, 14, 15, 16 and 17, in particular, of the Extractive Industries SEPP. Refer to accompanying Table 3.8. The Project complies with these relevant provisions of the Extractive Industries SEPP.

Table 3.8: Project Compliance with Extractive Industries SEPP

Relevant SEPP provision	Assessment
Clause 7-Permissibility **(3) Extractive industry** **Development for any of the following purposes may be carried out with development consent:** **(a) extractive industry on land on which development for the purposes of agriculture or industry may be carried out (with or without development consent)**	Extractive industries are permitted in zone RU1. The use is therefore permissible
Clause 12 **(a) consider:** **(i) the existing uses and approved uses of land in the vicinity of the development, and** **(ii) whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development, and** **(iii) any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses**	The Project is considered to be compatible with existing, approved or likely adjoining land uses in the neighbouring locality at Rock Flat. The locality already supports an existing extractive industry near the intersection of Springs Road and the Monaro Highway, with little evidence of any rehabilitation or noise mitigation measures in place. Similarly, on the opposite side of Springs Road is an abandoned open cut mine that has never been rehabilitated. Schmidt Quarries propose to implement a comprehensive progressive rehabilitation program for the quarry site as extraction advances, with visual and noise mitigation measures in place. The Project would be operated in such a way as to minimise any potential environmental impacts, as detailed in Section 2 of the EIS

Clause 12 **(b) evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a) (i) and (ii)**	There are clear public benefits in allowing the proposed quarry, including maintaining existing quarry employment (the Nimmitabel workforce to be relocated to the proposed quarry site), strengthening the local economy and providing a long term, quality, resource to local and regional businesses. The hard rock material is of good quality and satisfies known demand for this material in the surrounding region. The quarry is in a sparsely populated rural location, reasonably buffered to most surrounding rural residential land uses. The existing quarry is compatible with nearby land uses. Impacts from the proposed quarry expansion are expected to be minimal and appropriate mitigation measures are proposed
Clause 12 **(c) evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a)(iii)**	Refer to the above. The quarry includes various measures to mitigate environmental impacts- refer Section 2 of the EIS, in particular
Clause 13 Compatibility	Refer to above
Clause 14 **(a) Impacts on water resources** **(b) Impacts on threatened species, biodiversity avoided or minimised to the greatest extent possible** **(c) Greenhouse gas emissions are minimised**	Satisfactory. The impacts of the Project have been considered in Section 5 of the EIS and found to be both manageable and satisfactory. Section 2 contains details of the Project and mitigation measures proposed. The quarry is set back a satisfactory distance from any watercourses. The development is unlikely to have an impact on current or future extraction or recovery of minerals, petroleum or extractive materials. The Project seeks to make the most efficient use of the existing quality, hard rock resource found within the the volcanic plug found on the site. The land is cleared and has no known environmental values, save for the habitat of a threatened lizard species in parts of the Project Site near the railway line and to the south of the proposed quarry site. Volcanic rock typically requires less greenhouse emissions to process, compared to other rocks. Greenhouse gas emissions from quarry vehicles related to the development is expected to be minimal
Clause 15 Resource Recovery	The project will enable the optimisation of a valuable, quality volcanic hard rock resource that will provide economic benefit to the locality and to the broader region. The project is considered to be highly efficient as it proposes to recover all of the resource to the maximum recoverable depth possible
Clause 16 Transport	The potential impacts of transport of quarry products on the capacity, efficiency and safety of the road network have been assessed and are discussed in Section 5 of the EIS. Two highway access options are considered in this EIS. Refer to Streetwise traffic assessment report which accompanies this EIS

Clause 17 Rehabilitation	Satisfactorily addressed- refer Section 2 of this EIS. The land will be made safe, maintained and appropriate erosion/sediment control devices installed. There should be no long-term risks to public safety. One of the key objectives of the rehabilitation program would be the development of landforms which are stable in the long-term, capable of future use for grazing purposes. Schmidt Quarries have successfully implemented rehabilitation at the nearby Nimmitabel quarry, some 12km to the south of the Project Site- also a volcanic plug. Rehabilitation will be employed based on proven effectiveness and success of rehabilitation techniques at Nimmitabel quarry

Clause 10 of the Extractive Industries SEPP describes various exempt developments that do not require approval under the EP&A Act. This provision has relevance for minor activities undertaken within any quarry, as well as for rehabilitation and decommissioning work. Exempt development listed under the Extractive Industries SEPP which specifically relates to the decommissioning process includes the demolition of a building or structure that is carried out in accordance with Australian Standard AS2601-2001, Demolition of Structures, but only if the building or structure is not, or is not part of, a heritage item, or in a heritage conservation area, identified by an environmental planning instrument (Mining SEPP). Such demolition work is exempt from planning approvals provided it takes place on an approved site and is of minimal environmental impact.

3.3.6 SEPP No. 33- Hazardous and Offensive Development

State Environmental Planning Policy No. 33– Hazardous and Offensive Development (SEPP 33) relates to "potentially hazardous" or "potentially offensive" developments, and requires specified matters to be considered by consent authorities when assessing such applications. The SEPP is applicable to the whole of NSW. The quarry will store and use small quantities of a range of dangerous goods. All dangerous goods would be stored in suitable containers in the quarry maintenance/infrastructure area.

The development is is not considered to be a "hazardous industry", "hazardous storage establishment", "offensive industry" or "offensive storage establishment" having regard for the following:

- Adequate safeguards are proposed to ensure emissions can be controlled to a level at which they are not significant. The quantity and nature of discharges and the significance of the offence likely to be caused by the development, having regard to the nature of the surrounding land use and the proposed controls, are matters to be considered by the consent authority. The proposed development will produce noise and dust emissions that are considered to be satisfactory. Given the design of the proposed quarry, there will be minimal potential for polluted stormwater runoff or air emissions affecting neighbouring residences. Accordingly, there is a low potential adverse effects from emissions or discharges on surrounding land uses.

- The proposed development involves the extraction of a volcanic hard rock, which is an inert rock. The process of extraction and allied activities will generally not pose any risks to human health in the locality.

- Related to the above, the NSW Government's Heads of Asbestos Coordination Authorities (HACA) has published information on naturally occurring asbestos and have published maps of areas in New South Wales with a low, medium or high potential for naturally occurring asbestos to occur. The Project Site is mapped as an area with no potential for naturally occurring asbestos.

- There is minimal potential for site contamination, as concluded by consultants Geolyse.

- Mitigation measures are proposed to limit any hazardous or offensive discharges. For instance, fuel storage areas will be appropriately bunded. The proposed development provides for pollution controls and management measures that will protect all aspects of the environment. Truck speed restrictions are to apply to quarry trucks operating within the project site. Air quality controls are also proposed. Refer to section 2 for details of mitigation measures proposed in this regard. With these controls in place there should be no meaningful risk to the environment in the locality.

- Blasting and processing of quarry products will be undertaken within noise and vibration parameters set out in the consent issued by Council in May 2011 and the EPL issued by the NSW EPA.

- Site water ('dirty water') will be treated within the quarry site.

- TheProject will have no significant adverse impacts on local amenity or the environment.

- There will be no storage of explosives and/or detonators on the land.

- Schmidt Quarries seek a continuation of proven quarry management measures already in place at their nearby Nimmitabel quarry operations. This quarry is already subject to established quarry management procedures and an management techniques designed to minimise hazards or potentially offensive development. These established procedures would be maintained at the proposed quarry to ensure that potential hazard and risk impacts are minimised.

A SEPP 33 Screening Test has been performed for this project (refer below). As can be seen for this test, SEPP 33 does not apply for this proposal and hence a Preliminary Hazard Analysis is not required.

Table 3.9: Checklist of information required in relation to the risk screening method

Item	Details
All dangerous goods and hazardous materials involved in the development	Diesel Fuel (Plant fuel), Petrol Fuel (Mowers, whipper snippers), Degreaser (cleaning engines for repairs), Engine Coolant (plant engine coolant), Cleaning Agent (general cleaning), Pesticides (weed control) and Acetylene (part of oxyacetylene kit used for repairs and maintenance of quarry equipment)
Dangerous goods classifications **[NOTE: Does not apply in the case of any stored engine oil, hydraulic oil, transmission oil, greases to be stored on the quarry site]**	Diesel Fuel (C1 Combustible Liquid) Petrol Fuel (3 PGII) Degreaser (3 PGII or III) Coolant (3 PGIII) Cleaning Agent (8 PGII or III) Pesticide 6.1 Acetylene 2.1
Quantities of dangerous goods	Diesel Fuel storage is to be in aboveground storage tanks– approx. 20 000L, self-bunded Petrol fuel to be stored in workshop/ storage shed- Small 20 litre and 10litre drums Degreaser, Coolant, Cleaning Agent and pesticides to be generally stored in 20 litre drums in workshop/ storage shed Acetylene stored in compressed gas tank- locked and separate from other stored equipment

Existing site – dangerous goods	All dangerous goods would be stored in suitable containers in the maintenance area of the quarry
Distance from the boundary for each substance	Satisfactory. The distance to the lot boundary is at least 140m
Weekly and annual number of deliveries (and quantities) of dangerous goods to and from the locality	Delivery estimates for diesel fuel are based on the size and typical usage of the proposed quarry. A typical road tanker would carry 30,000L; hence a fuel tanker delivery could occur on average up to one per day, at maximum production. Periodic deliveries of other dangerous goods less frequently- every few months on average
Site layout plan showing proposed development	Refer Section 2 of EIS
Site layout plan showing proposed development, Local layout plan showing immediate neighbours and their activities, nearest residence	Refer to EIS.The surrounding land is cropping/farmland. The nearest neighbour is 1,690m from the the proposed quarry

The total storage capacity for diesel fuel at the quarry will be approximately 20,000 litres. (20kL). Therefore 20kL should be considered for screening purposes. C1 Combustible liquids are defined as dangerous goods under NSW workplace legislation. The Threshold quantity for C1 combustible liquids is 10,000kg or L, which indicates that WorkCover NSW must be notified and manifests and emergency plans developed. Hence threshold screening is not triggered and further analysis is not required and hence SEPP 33 does not apply in this regard. Combustible liquids are not classified as dangerous goods but are designated as either C1 or C2 combustible liquids (WorkCover NSW *Storage And Handling of Dangerous Goods Code of Practice 2005*). Refer to Applying SEPP 33 Table 2 - Transport threshold figures are not triggered. In such circumstances the NSW Department of Planning & Environment would deem the facility as non-hazardous and further risk assessment is not required. It is concluded that SEPP 33 does not apply to the development and therefore a Preliminary Hazard Analysis is not required.

3.3.7 SEPP No.44- Koala Habitat Protection

State Environmental Planning Policy No. 44 (Koala Habitat Protection) (SEPP 44) applies to certain LGAs in NSW, including Snowy-Monaro Regional Council. SEPP 44 requires the consideration of whether land that is the subject of the Development Application is considered to be "potential Koala habitat" or "core Koala habitat". The quarry site is cleared land. An assessment of Koala habitat for the purposes of SEPP 44 has been undertaken. The assessment concluded that the Project Site does not comprise potential Koala habitat. No further assessment under SEPP 44 is required- refer to report by Gunninah accompanying this EIS for details.

3.3.8 SEPP (Rural Lands) 2008

State Environmental Planning Policy (Rural lands) 2008 applies to certain LGAs in NSW, including Snowy-Monaro Regional Council. The SEPP applies to rural subdivisions and dwellings, however, the principles of the SEPP are applicable to the Project. The principles of State Environmental Planning Policy (Rural Lands) 2007 are as follows:

"(a) the promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas,

(b) recognition of the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State,

(c) recognition of the significance of rural land uses to the State and rural communities, including the social and economic benefits of rural land use and development,

(d) in planning for rural lands, to balance the social, economic and environmental interests of the community,

(e) the identification and protection of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land,

(f) the provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities,

(g) the consideration of impacts on services and infrastructure and appropriate location when providing for rural housing,

(h) ensuring consistency with any applicable regional strategy of the Department of Planning or any applicable local strategy endorsed by the Director-General."

The Project complies with the above principles, as detailed in the following.

The quarry site itself has limited or no agricultural significance. Much of the quarry site is characterised by exposed or near-surface rock, which severely limits agricultural potential. In this regard the Project Site is ideally suited for the purpose of the extraction of volcanic hard rock material, as it will not cause the loss of any valuable agricultural land on the Monaro Plain. The limited extent of the proposed quarry will not impair any agricultural productivity on the remainder of the Devereux farm holding and will not result in the permanent loss of any significant farmland on this rural holding. No mitigation measures will be required over and above those already in place. The proposed quarry will enable better utilisation of a valuable quarry resource which will provide economic benefit to the locality and to the broader region.

The extraction of the hard rock resource from the Project Site will serve to provide a longer term supply of quarry materials to allow the construction of needed infrastructure in the region.[NOTE:The Department of Planning and Environment is currently seeking submissions on proposed changes to the existing planning controls governing primary production and rural development. The proposed changes are set out in the *Primary Production and Rural Development – Explanation of Intended Effect*. These changes do not have the status of a draft planning instrument.]

3.3.9 SEPP No.55- Remediation of Land

State Environmental Planning Policy No. 55 (Remediation of Land) (SEPP 55) is applicable to the whole of NSW. SEPP 55 is concerned with the remediation of contaminated land and sets out matters relating to contaminated land that a consent authority must consider in determining an application for Development Consent.

"Contaminated land" in SEPP 55 has the same meaning as it has in the EP&A Act, namely:

"contaminated land means land in, on or under which any substance is present at a concentration above the concentration at which the substance is normally present in, on or under (respectively) land in the same locality, being a presence that presents a risk of harm to human health or any other aspect of the environment."

Geolyse was engaged by Schmidt Quarries to conduct a Stage 1 Contaminated Site Investigation (S1 CSI) for the site of the proposed hard rock quarry as a component of the Environmental Impact Statement (EIS) to address the Secretary's Environmental Assessment Requirements (SEARs) for the proposed quarry.

A search of the NSW EPA on-line register (http://www.environment.nsw.gov.au/prclmapp/) was undertaken in 2017 for contaminated land notices issued or regulated under the *Contaminated Land Management Act 1997*. The search indicated that the NSW EPA holds no contaminated land records relating to the site and properties within 1 km of the Project Site. Land uses at the majority of the site have been generally limited to grazing land. Various chemicals such as arsenic, organochlorine pesticides (OCPs) and organophosphorus pesticides (OPPs) associated with sheep and cattle grazing activities are potential contaminants at the site based on known historic uses, however these are unlikely to have been utilised in the area of the proposed quarry. No sheep dips or cattle dips were observed at the site.The study concluded that no further investigation was required. Additionally, and based on the findings of this preliminary site investigation, Geolyse conclude that risks to quarry personnel from potential soil contamination impacts may be adequately managed by conducting works in accordance with construction industry standards. Refer also to **Appendix K**.

[NOTE:The Department of Planning and Environment is currently seeking submissions on proposed changes to the existing SEPP. The proposed changes are set out in the *Remediation of Land SEPP – Explanation of Intended Effect. The new SEPP will repeal and replace State Environmental Planning Policy No 55 - Remediation of Land (SEPP 55).* These changes do not have the status of a draft planning instrument, nor should it have any significant impact on the SEPP 55 assessment undertaken for the purposes of this EIS.]

3.3.10 Draft South East and Tablelands Regional Plan

The South East and Tablelands region applies to 14 local government areas extending from the Southern Highlands and Tablelands to the Victorian border, surrounding the Australian Capital Territory (ACT), including Snowy-Monaro Regional Council LGA. It states, inter alia:

"This draft Plan presents a planning framework that is founded on the following key principles:

- *facilitate economic growth, environmental management and social wellbeing;*
- *respond to the region's landscape,*
- *environmental assets, natural and cultural resources, mineral and energy resources (including renewable energy);*
- *respond to long term structural economic and demographic changes, with a focus on ageing, migration patterns and productivity;*
- *recognise the implications of a changing climate and build resilience to natural hazards;*
- *guide the locations for new housing and provide greater housing choice;*
- *encourage economic activities, consistent with changing market demands and industry needs;*
- *inform infrastructure and services investment, and coordinate with land use; and*
- *integrate cross-border drivers of change and coordinate responses Statewide and nationally."*

Only modest population growth is forecast for the "Alpine" area covered by this Plan, including Snowy-Monaro Regional Council LGA: 800 persons. The proposed quarry operation is considered in terms of relevant goals, directions and actions contained in this draft Plan, summarised in the accompanying Table 3.9.

Table 3.9: Compliance of the Project with Draft South East and Tablelands Regional Plan

Draft Plan Goals, Directions	Compliance
"GOAL 2 – Protect and enhance the region's natural environment" ***"DIRECTION 2.1 Protect the region's diverse environmental values"*** ***"ACTION 2.1.1 Avoid, minimise and offset the impact of development on significant environmental assets"*** ***"ACTION 2.1.2 Protect the region's biodiversity corridors in local planning controls"***	Parts of the Project Site are identified as containing land of High Environmental Value in the Draft Plan, reflecting the current LEP, associated with Clause 6.3 Terrestrial Biodiversity in the Cooma-Monaro Local Environmental Plan 2013. Results of flora/fauna investigations identify the habitat of a threatened lizard species near the disused rail line- confined to native tussock grass areas. The quarry haul route has been re-designed to avoid running through any identified habitat of this lizard species, running through areas of improved pasture only
"DIRECTION 2.4 Protect and secure the region's water resources"	The Project lies outside of any sensitive catchments, including drinking water catchments. The Project will not affect any groundwater resources. The quarry design incorporates various measures to ensure that there are no adverse downstream impacts arising from the development proposed.All stormwater is to be retained within the bounds of the active quarry area
"DIRECTION 2.5 Protect the region's cultural heritage"	Results of archaeological investigation find no sites within the Project Site

"GOAL 3 – Strengthen the economic opportunities of the region" ***"DIRECTION 3.2 Enhance the productivity of primary industries"*** ***"ACTION 3.3.3 Protect valuable mineral and extractive resources in the region"***	The Project Site does not comprise important agricultural land. quarry can proceed without detriment to or conflict with the surrounding rural uses. The Project Site contains a valuable extractive resource, which can be won without detriment to the surrounding environment or conflict with surrounding land uses
"ACTION 4.5.2 Identify and protect future rail corridors. The Australian Government is investigating opportunities for a high-speed rail network between capital cities along the east coast. If feasible, it would significantly reduce travel times between the east coast capital cities and regional centres, and increase transport options in regional NSW. This may generate new opportunities for economic development in the region."	The internal haul route of the quarry project proposes to cross a currently disused rail line. The crossing is a registered rail crossing. There are no plans by State Government to reactivate this rail line, currently in a poor state of repair.

The establishment of this quarry resource is consistent (or not inconsistent) with the above Draft Plan goals, directives and actions.

▪ 3.4 Cooma-Monaro Development Control Plan 2014 (Amendment 1)

The relevant development control plan (DCP) applicable to the Project Site is the *Cooma-Monaro Development Control Plan 2014 (Amendment 1)* in force from 23 March 2016 (the DCP). This DCP provides detailed provisions with respect to the design and carrying out of development within Cooma-Monaro Shire, complementing the statutory provisions contained in *Cooma-Monaro Local Environmental Plan 2013* and assisting in the achievement of its aims and objectives. The aims of the DCP are set down in clause 1.7, as follows:

"This Plan aims to:

1 Provide detailed development controls for the whole of the Cooma-Monaro local government area to assist in the achievement of the aims and objectives of the Cooma-Monaro Local Environmental Plan 2013.

2 Achieve a high quality environment (both natural and built) that maintains or enhances the character of the Cooma-Monaro local government area and its localities.

3 Encourage development that contributes to the quality of the public domain.

4 Ensure development positively responds to the qualities of the site and its context.

5 Guide applicants in preparing high-quality standard development applications.

6 Provide clarity and guidance regarding Council requirements for specific types of development."

The proposed development complies with the above aims in terms of:

- Achieving a high quality quarry environment that maintains the local character of the locality.
- Achieving a quarry development that positively responds to the qualities of the site and its context, particularly in terms of visual context and impacts.
- Satisfies Council requirements for extractive industry development. Discussed further in the following.

The DCP contains specific guidelines for extractive industries , contained in clause 5.2 of the DCP, as well as provisions relating to:

- Contaminated land (clause 6.3).
- Flood prone land (clause 6.4).
- Heritage (clause 6.5).

- Groundwater vulnerable land (clause 6.6). The project Site is identified in the LEP as being partly affected by this designation.
- Native flora and fauna(clause 6.7).
- Important views and vistas (clause 6.11).

Compliance of the project with the relevant provisions of the *Cooma-Monaro Development Control Plan 2014 (Amendment 1)* are summarised in the accompanying Table 3.10.

Table 3.10: Cooma-Monaro DCP 2014 and the Project

DCP provision	Compliance
Chapter 5.2 Extractive industries and mining	The proposal is to operate the quarry in an environmentally sound manner and to not negatively impact on the amenity of the surrounding area, in compliance with the objectives of this part of the DCP. The EIS contains information relating to the quarry proposed including but not limited to details of the scale of quarrying proposed, a detailed survey of the land proposed to be worked, drilling data (also relevant to the existence of groundwater), soil and water management, rehabilitation and the like. The proposed quarry is more than 500m from the nearest residence. No local public roads are proposed as a haulage route, the intention being to have direct access to the Monaro Highway. Access is proposed to be provided generally in compliance with Chapter 2 of the DCP and with RMS requirements
Chapter 2.8 Erosion and sediment control	Erosion and sediment control details are provided in the EIS- refer Section 2
Chapter 2.9 landscaping	The Project will entail extensive landscaping around the perimeter of the working quarry area, to screen quarrying activities from the nearest dwelling and from the Monaro Highway to the east. The combined effect of the topographical characteristics of the site, the sensitive design approach that has been adopted, and the additional mitigation measures to which the proponent has committed to will ensure that the visual impacts of the project are appropriate and acceptable
Chapter 2.5 Vehicular access & roads, 2.10 off street parking	The operational area of the quarry, as well as the internal haul route, have been designed to accommodate quarry haul vehicles and car parking for staff. It is proposed that the new intersection with the Monaro Highway will be upgraded to RMS requirements.
Chapter 6.1 Bushfire prone land	The Project Site is not identified as being bushfire prone land
Chapter 6.2 Gateways	Not applicable to the Project Site
Chapter 6.3 Contaminated land	Not identified as contaminated land in Council s.149 Certificate applicable to various lots comprising Project Site- not on Council's Contaminated Lands Register. Stage 1 assessment by Geolyse finds low likelihood of any on site contamination.
Chapter 6.4 Flooding	Not identified as flood prone land
Chapter 6.5 Heritage	The quarry operation is not within view of historic rural dwellings in the locality. Appropriate plantings, in keeping with the cultural landscape, are proposed on site. No adverse heritage impacts likely. No impact on the heritage site at the corner of Springs Road and the Monaro Highway comprising an unsightly abandoned mine site
Chapter 6.6 Groundwater vulnerable land	The NSW State government has prepared a 'groundwater vulnerability' map which covers the Cooma-Monaro local government area. This map has been used to prepare the *Cooma-Monaro Local Environmental Plan 2013* Groundwater Vulnerability Maps and the associated clause (6.4). The drilling results on site by the quarry operator indicate no presence of groundwater at depth, within over the volcanic plug or on the hill surrounding the plug

Chapter 6.7 Native flora and fauna	The The *Cooma-Monaro Local Environmental Plan 2013* contains a Terrestrial Biodiversity Map and associated clause (6.4). Results of flora/fauna investigations identify the habitat of a threatened lizard species near the disused rail line- confined to native tussock grass areas. The quarry haul route has been re-designed to avoid running through any identified habitat of this lizard species, running through areas of improved pasture only
Chapter 6.11 Important views and vista- areas with high landscape value	Certain areas within the LGA are considered of outstanding landscape value and should be protected from development that will negatively impact upon it. This part of the DCP identifies important vistas and landscapes. The DCP requires that: • *"Development within the high landscape value areas identified on the maps below must be designed and located so as not to interfere with or despoil the visual appearance of the landscape.* • *Vistas identified on the maps below are to be protected from insensitive development. (The important vistas are identified by arrows.)* " The Project Site lies well to the north of and outside of the Peak Road landscape Area
Chapter 7.4 On-site Waste Management Systems	Appropriate on site waste disposal is proposed. The system required once the quarry is established will require an application under Section 68 of the *Local Government Act 1993*

Based on the above, it is concluded that the project is capable of generally complying with the above DCP provisions. This is notwithstanding the fact that the provisions of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* override *and* exclude from consideration any otherwise relevant provisions of a local council LEP or DCP that are inconsistent with this SEPP (clause 8 of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*).

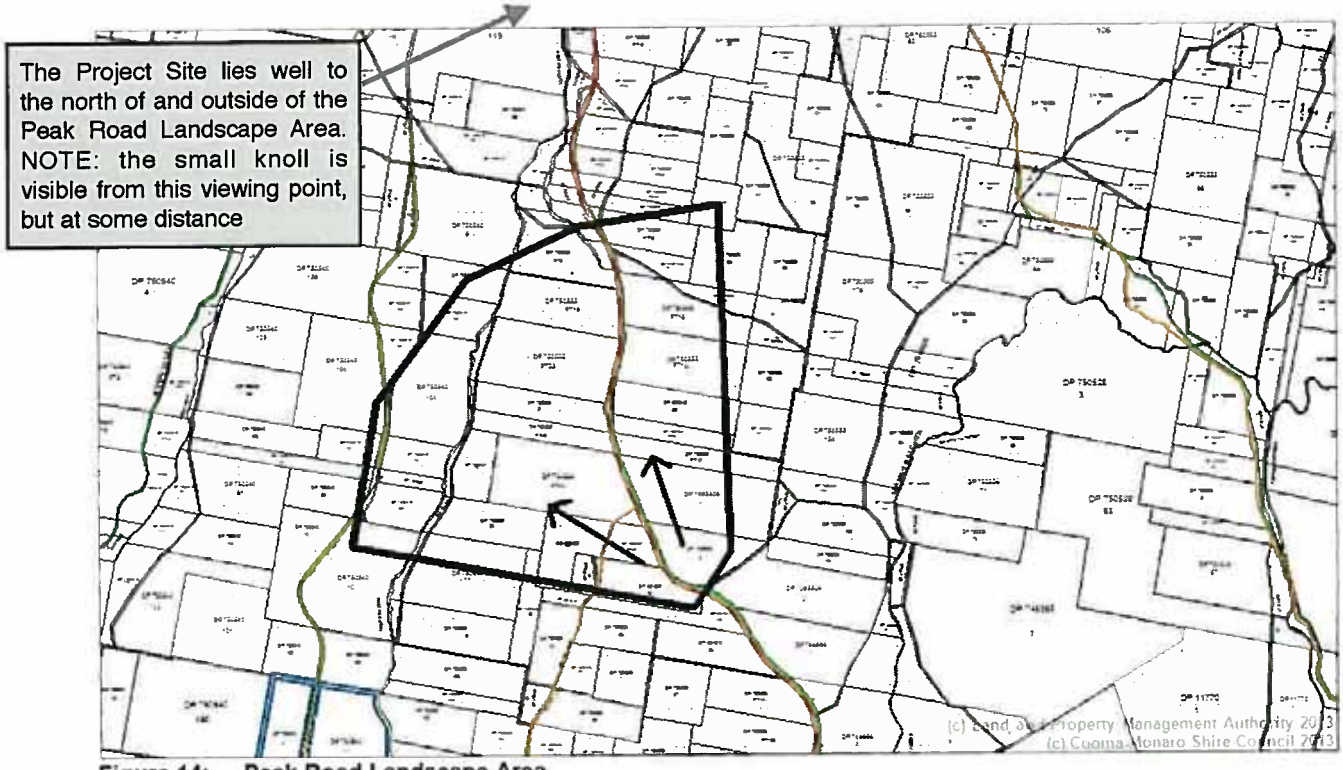


Figure 14: Peak Road Landscape Area

FIGURE 3.6: DCP 2014 Important Vistas and Landscapes Map

(Map Base Source: Cooma-Monaro DCP 2014 Figure 14 Peak Road Landscape Area)

3.5 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act, 1997* and and the NSW *Protection of the Environment Operations (General) Regulation 2009* provides an integrated system of licensing for industries, like quarries. Under the provisions of Schedule 1 of the *Protection of the Environment Operations Act, 1997* any quarry that involves the extraction, processing or storage of more than 30,000 tonnes per annum of extractive materials must hold an Environment Protection License (EPL) for that scheduled quarry activity. The NSW *Protection of the Environment Operations (Waste) Regulation 2005* sets out provisions covering the manner in which waste is managed.

Once approved, the proposed hard rock quarry will operate under the terms and requirements of an Environment Protection License for a Land Based Extractive Activity under the the provisions of the *Protection of the Environment Operations Act, 1997*, similar to that applying to Schmidt Quarries existing Nimmitabel quarry operation. Such a license would be issued by the Environment Protection Authority of NSW. Any EPL issued would cover matters relating to quarry management including air, water, noise and waste emissions and impacts including but not limited to controls and details relating to the following:

- Description of location of the quarry.
- Crushing, grinding and screening activities.
- Controls on pollution of waters, including allowed discharge points.
- Controls on blasting.
- Monitoring and recording conditions.
- Recording of pollution complaints.
- Reporting conditions.

The EPA has recently released the *Noise Policy for Industry* (2017), to replace the *NSW Industrial Noise Policy* (2000), however under transitional arrangements where SEARs were issued before the release of the new policy (which is the case here), and have not been modified, the assessment requirements referenced in the SEARs will apply for a period of two (2) years from the date of issue of the SEARs consistent with the provisions in the *Environmental Planning and Assessment Regulation 2000*, Schedule 2, Part 2, 3 (7).

3.6 Water Management Act

The *Water Management Act 2000* governs the issue of new water licences and the trade of water licences and allocations for those water sources (rivers, lakes and groundwater) in NSW where water sharing plans have commenced. The *Water Act 1912* governs the issue of water licences in other areas.

The aim of the *Water Management Act 2000* is to provide for the sustainable and integrated management of the water sources of NSW for the benefit of both present and future generations and defines rules for management of surface water and groundwater in NSW. The *Water Act 1912* and the *Water Management Act 2000* contain provisions for the licensing of water capture and use. If any dams are proposed as part of the water management, consideration must be given to whether the dams need to be licensed.

Water sharing plans have been developed for rivers and groundwater systems under the *Water Management Act 2000*. The water sharing plans specify maximum water extractions and allocations. The Project Site forms a part of the Murrumbidgee catchment area and the Lachlan Fault and is covered by the *Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources 2011*, made on 5 July 2013.

It establishes rules for sharing water between the environmental needs of the river or aquifer and water users, and also between different types of water users such as town supply, rural domestic supply, stock watering, industry and irrigation. The plan accompanying the *Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources 2011* identifies a groundwater source (spring) near the junction of Springs Road and the Monaro Highway, at an elevation of about 880m, approximately 100m below the level of the proposed quarry, being at an RL of 980m or more.

Under the *Water Management Act 2000* landowners have access to water, termed as 'harvestable rights'. Harvestable rights orders made by the Minister under Section 54 of the *Water Management Act 2000* give a landholder the right to capture 10% of the average regional rainwater runoff on the land by means of a dam or dams having not more than the total capacity calculated in accordance with Schedule 1 of the orders, providing such structures are located on minor streams only (i.e. first and second order streams- as is the case here at the Project Site). This water can, in most cases, be used for any purpose.

Clause 36 of the *Water Management (General) Regulation 2011* provides exemptions for both construction and use of certain classes of water storage structures as set out in Schedule 1 of the Regulation. Schedule 1(3) of the NSW *Water Management (General) Regulation 2011* provides for the following exclusion:

> *"Dams solely for the capture, containment and recirculation of drainage and/or effluent, consistent with the best management practice or required by a public authority (other than Landcom or the Superannuation Administration Corporation or any of their subsidiaries) to prevent the contamination of a water source, that are located on a minor stream."*

There is no restriction on the use of water from dams that comply with this provision, which includes dams used for the purposes of extractive industries (ie.quarries). These provisions are applicable to any erosion and sediment control basins constructed to control runoff until such time as the vegetation has established to the point when sediment runoff is minimal. In this regard the 'dirty' water management system proposed includes the collection, management and distribution of water from within the active extraction area, runoff from overburden emplacement areas, and management of water affected by activities associated with the handling and processing of quarry products, as well as allied operational uses. The water in these areas would be classed as 'dirty' water. 'Dirty' water includes runoff from disturbed areas and those areas to be rehabilitated. The 'dirty' water management system includes a series of catch drains and sediment dams located to capture and manage runoff from disturbed areas.

All sediment basins associated with the Project will be constructed and operated for the purposes of sediment control, involving the impoundment of 'dirty' water, and are therefore excluded from the requirements of the harvestable rights order and do not require licensing under the *Water Management Act 2000*.'Clean' water management measures proposed includes diversion drains, catch drains, and clean water catch dams around the perimeter of the proposed quarry operational areas.

▪ 3.7 NSW Biodiversity Conservation Act & Other NSW Legislation

In addition to specific requirements referred to in the development consent, site operations are to be conducted in accordance with all relevant New South Wales legislation. The existing rail crossing is registered as private level crossing with Transport for NSW. Other New South Wales legislation applicable to the proposed extraction of hard rock from the Project Site includes the following:

- *Local Government Act, 1993.*
- *Roads Act, 1993.* The *Roads Act 1993* regulates the carrying out of certain activities on public roads, provides a classification of roads, and establishes procedures for opening and closing public roads. A new connection is proposed to the Monaro Highway, requiring approval from the RMS.

- *Waste Avoidance and Resource Recovery Act, 2001* governs the management of waste.
- *Threatened Species Conservation Act 1995*. [Now replaced by NSW *Biodiversity Conservation Act* but still applicable to this Project].
- *National Parks & Wildlife Act 1974*.[Repealed in part- refer to commentary below]
- *Contaminated Land Management Act 1997*. The Project Site and surrounds is not classified as contaminated land for the purposes of this act.
- *Rural Fires Act 1997*. The proposal does not require referral to the RFS under section 100B of the *Rural Fires Act 1997* or section 79BA of the *EP&A Act*. As such, the quarry proposal is not required to comply with the *Planning for Bushfire Protection 2001*.
- *Transport Administration Act 1988* (disused rail line).

The newly enacted NSW *Biodiversity Conservation Act* came into effect in 2017. Coupled with the *Local Land Services (LLSA) Amendment Act*, and the supporting Regulations and products, it establishes a modern and integrated legislative framework for land management and biodiversity conservation in NSW.

The biodiversity conservation and land management reforms repeal several existing Acts, in particular the *Native Vegetation Act 2003*, *Threatened Species Conservation Act 1995* and the *Nature Conservation Trust Act 2001*. Also repealed are the animal and plant provisions of the *National Parks and Wildlife Act 1974*. Part 7 of the new act applies to biodiversity assessment under the EP& A Act 1979.

However, the following savings & transitional arrangements apply under the new Act, included in clause 27 of *Biodiversity Conservation (Savings and Transitional) Regulation 2017* which states:

"pending or interim planning application means any of the following:

(a) .....,

(b) an application for planning approval (or for the modification of a planning approval) made within 18 months after the commencement of the new Act if an ***environmental impact statement*** *is to be submitted in connection with the application and the* ***Secretary of the Department of Planning and Environment*** *issued, before the commencement of the new Act,* ***environmental assessment requirements for the preparation of the statement,*****.....*** *"* [our emphasis]

Further, Clause 28 states:

"28 Former planning provisions continue to apply to pending or interim planning applications

(1) The former planning provisions continue to apply (and Part 7 of the new Act does not apply) to the determination of a pending or interim planning application.

(2) However, Part 7 of the new Act applies to the determination of a pending or interim planning application referred to in paragraph (b), (c) or (d) of the definition of pending or interim planning application in clause 27 (1) if the applicant or proponent and the planning approval body for the application agree in writing that Part 7 of the new Act is to apply to the determination of the application instead of the former planning provisions."

In short, the above provisions mean that the proposed development is classed as a pending or interim planning application. As such, Part 7 of the new Act does to apply to this development application the subject of this EIS.

The *National Parks & Wildlife Act 1974* protects Aboriginal heritage (places, sites and objects) within NSW; the *National Parks and Wildlife Regulation 2009* provides a framework for undertaking activities, including heritage assessments, and exercising due diligence. Protection of Aboriginal heritage is outlined in s86 of the *National Parks & Wildlife Act 1974*. Key provisions include: *"A person must not harm or desecrate an object that the person knows is an Aboriginal object"* s86(1), *"A person must not harm an Aboriginal object"* s86(2), and *"A person must not harm or desecrate an Aboriginal place"* s86(4).

3.8 Commonwealth Legislation

3.8.1 Environment Protection & Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) specifies generally that an approval from the responsible Commonwealth Minister is required to undertake controlled actions that include an action on any land that is likely to have a significant impact on a matter of national environmental significance. They include:

- World heritage properties. Not applicable.
- Places listed on the National HeritageRegister. Not applicable.
- Ramsar wetlands of international significance. Not applicable.
- Threatened flora and fauna species and ecological communities.
- Migratory species. Not applicable.
- Commonwealth marine areas. Not applicable.
- Nuclear actions(including uranium mining). Not applicable.
- Actions of development for coal seam gas or large coal mining on water resources. Not applicable.

If an action would, or is likely to, have a significant impact on any of the above categories it is deemed to be a Controlled Action requiring approval from the Commonwealth Environment Minister or the Minister's delegate.

The Gunninah ecological report concludes that on the basis of the impact amelioration measures which have been incorporated into the quarry project it is not likely that a "*significant impact*" would be imposed upon any relevant Matters of National Environmental Significance - as listed in the EPBC Act as a consequence of the proposal.

Nevertheless, for the purpose of 'abundant caution', a '*Referral*' of the quarry project proposal has been made by Gunninah to the Commonwealth pursuant to the EPBC Act.

3.8.2 Native Title Act 1993

The *Native Title Act 1993* (NT Act) is administered by the National Native Title Tribunal. The NT Act prescribes that native title can be extinguished under certain circumstances, including the granting of freehold land. The site is not subject to Native Title.

4.Existing Environment

4.1 Description of the Project Site

The Project Site comprises Lots 62, 76, 78, 106 and 120 in Deposited Plan 750540, at No. 278 Springs Road, Rock Flat, having an area of 368.82ha. it is located approximately 14km to the south of Cooma, on the NSW Southern Tablelands. Refer **Figure 4.1**. The Snowy Mountain region and Kosciuszko National Park, a major tourist destination and conservation area of National and State importance, are located over 50 km to the west. The Project Site forms a part of a much larger rural holding owned by Mr Peter Devereux, having a total area of some 2,000ha. The land proposed for extraction, as well as operational area containing allied uses including stockpiles and quarry processing plant, is referred to as the quarry site.

The Project is proposed to be sited on the high altitude plateau of the Monaro Plains, at altitudes of between 900 to 1035 metres above sea level. A number of intermittent watercourses bisect the Project Site, however, the proposed quarry operation is set back from these watercourses. The Project will be accessed from the Monaro Highway via a proposed internal access route connecting the proposed quarry to this highway via a crossing over a now-defunct railway line. Reflecting it's relatively remote location, only two (2) dwellings (Dwelling 1 and Dwelling 3- refer to **Figure 4.1**), not associated with the quarry, are located within 2km of the proposed quarry.

4.2 Landform, Geology & Soils

4.2.1 Landform and Geology

The site is located on a high plain, known as the Monaro Plains, an elevated plateau between the Great Escarpment to the east and the Snowy Mountains to the west. The Monaro Plains is a high plateau of generally undulating to rolling plains characterised by low hills and ranges approximately 900 to 1,200 metres above sea level. The Monaro Plains divides the catchments of the Murrumbidgee River, to the north, and Snowy River, to the south.

The Monaro Plains are characterised by low hills and ranges approximately 900 to 1200 metres above sea level.

> *"It is famously known as the treeless plain and many people think this is because it has been over grazed, but this is not the case. It was treeless when pioneers first came to the region. Lhotsky (1835) described the plains in the vicinity of Cooma "The scene all around was composed of undulating downs, long projected hills among them, covered with very few trees." The Monaro Plain is a classic case of how geology and weather affects land use. The soil in the region is thin, the temperatures are cold and the plain falls in a rain shadow area between the Eastern Escarpment and the Snowy Mountains."* (source: Geological Sites of NSW website)

In geological terms, the Monaro Plain is characterised by areas of granite and basalt soils. The basalt soils are derived from a parent geology that was created during the Tertiary era, when there was widespread volcanic activity and numerous eruptions centres, including vents, sills and a lesser number of larger volcanic plugs, have been located on the Monaro. The Monaro Volcanics form a blanket of basalt lavas to form a large north– south trending tableland during the Eocene to Oligocene, about 50 to 25 million years ago. Quaternary deposits cover much of the lower areas below the elevated plain. They tend to be found in valleys and lower hillside areas. Despite pockets of rich basaltic soil, the the average altitude of over 900 metres, location within a 'rain shadow' and extreme winter temperatures, preclude extensive crop growing or agriculture vernally. Much of the area is used for the grazing of sheep.

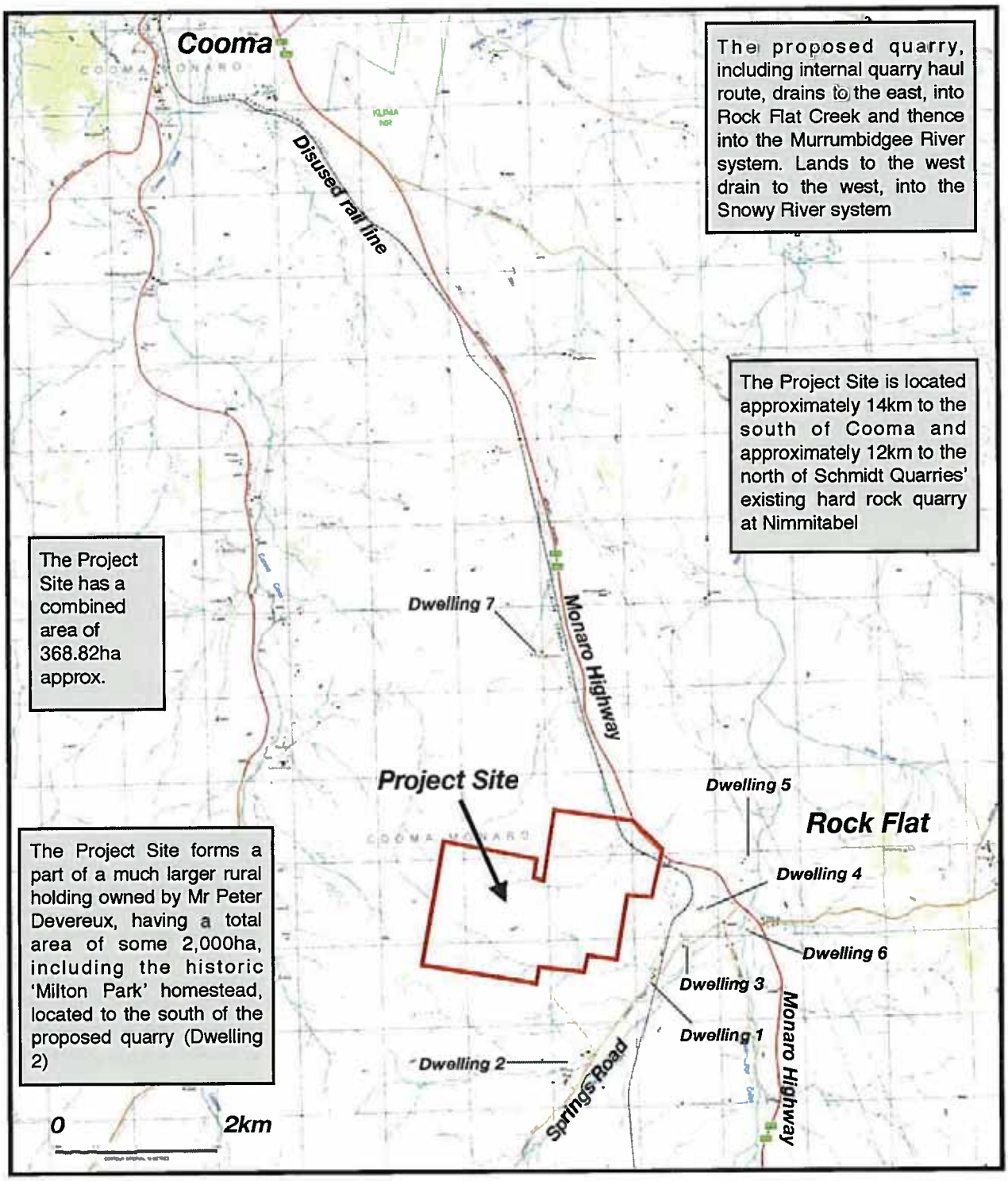


FIGURE 4.1: Location of Project Site & nearest surrounding dwellings

(Map Base Source: excerpt Land and Property Information Jillimatong 1:25,000 online map)

Refer to Table 4.5 for details

Significant stony outcrops can be found on the most elevated hills on the plain, with stone-littered areas resulting from previous ancient volcanic activity. Large, more elevated rounded stony hills- also comprising volcanic intrusives- such as The Brothers, which rise out of the plains generally to the west of the Project Site, contribute to the area's distinctive landscape. The small hill containing the volcanic plug, proposed for extraction, is a much lower, less visually prominent geological feature in the landscape. The above volcanic plugs, including that found on the project Site, are identified in geological mapping of this region- referred to as 'volcanic necks'.

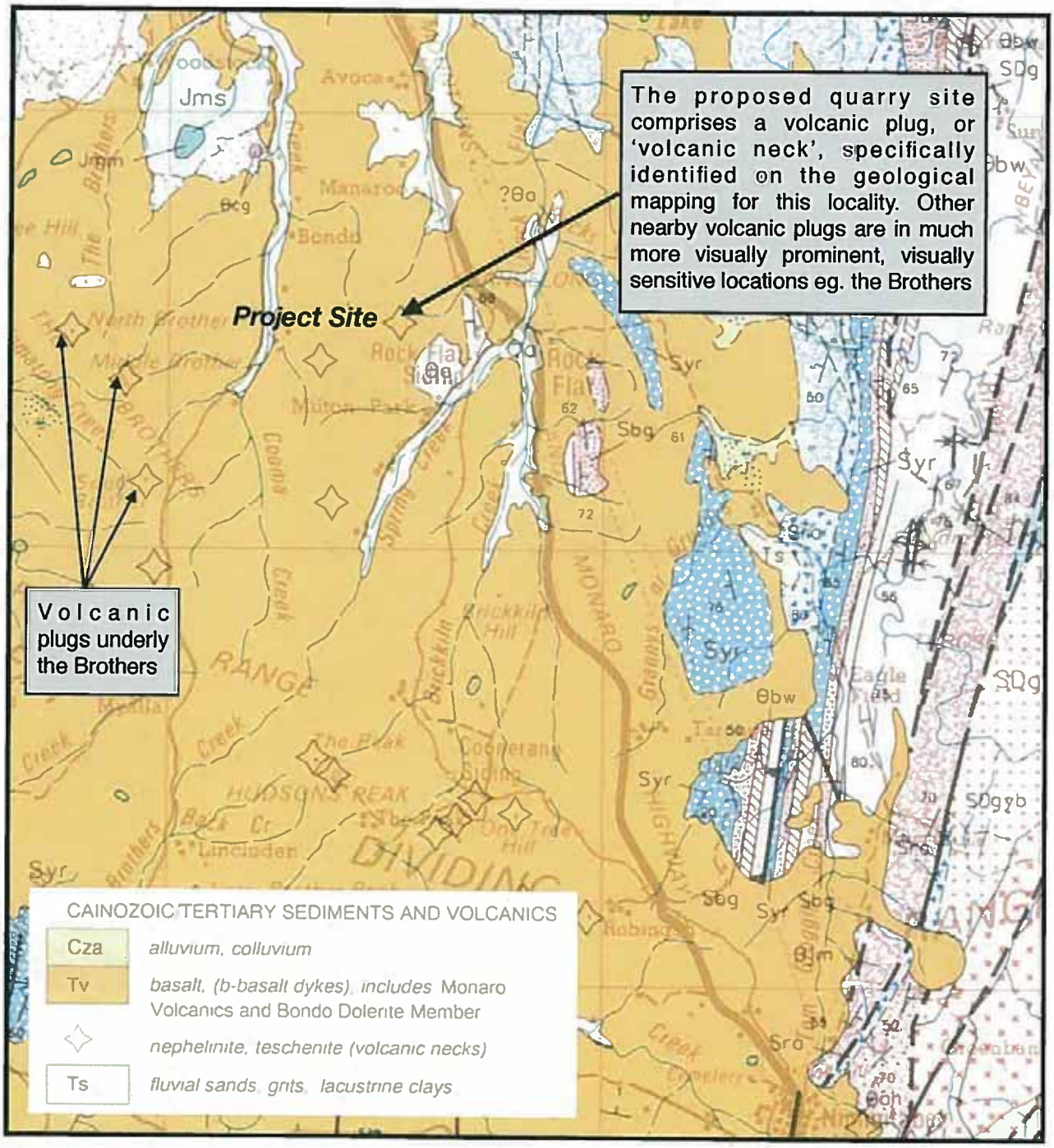
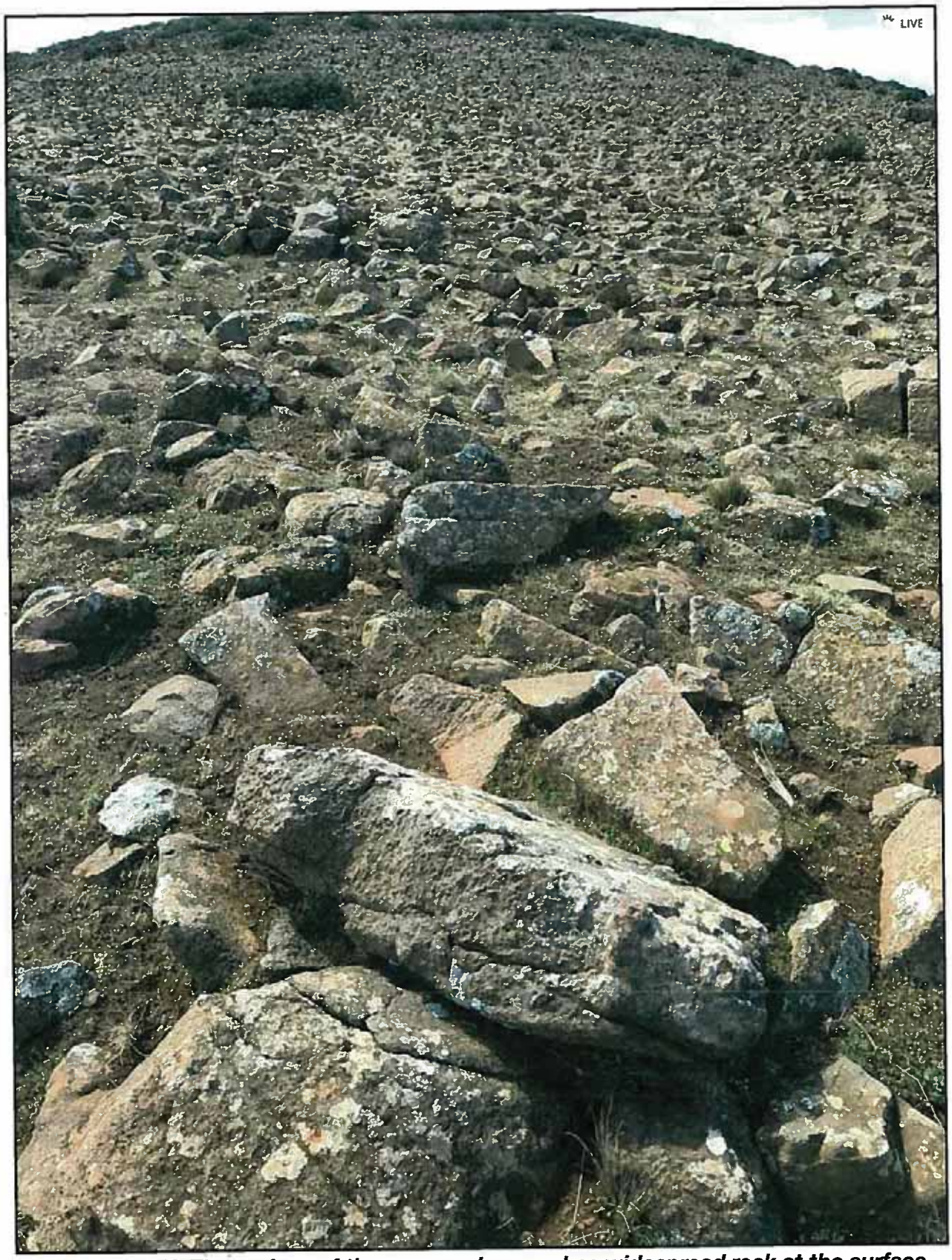


FIGURE 4.2: Geology of the Project Site & Surrounds

(Map Base Source: excerpt Bega-Mallacoota 1:250,000 geological online map)



PHOTOGRAPH: The surface of the proposed quarry has widespread rock at the surface. View looking south from north side of hill, at base of elevated knoll (all forming a part of Brothers Soil Landscape)

The Monaro Range forms a drainage divide within the Monaro Plains with areas to the north draining to the Murrumbidgee River and areas to the south to the Snowy River system.The Monaro Plain is also characterised by water bodies and wetlands formed in erosion depressions of the underlying bedrock and depressions associated with past fault activity, fed by groundwater, rainfall and/or runoff from local catchments. The project is located in a central section of the Monaro Range within the Snowy River catchment.

4.2.1 Soils

Reflecting their geology, soils on the Project Site and surrounds comprise Brothers soil landscape (**Figure 4.3**) and Maneroo soil landscape (**Figure 4.4**). The Brothers soil landscape generally comprises the more elevated parts of the hill on the project Site, with the Maneroo occupying mid slopes. Another soil landscape, Slacks Creek, is to be found in a stony outcrop near the rail line and on the south-eastern fringes of the project Site. The Project affects the Brothers and Maneroo soil landscapes only.

Table 4.1: Soil Landscapes of the quarry site & immediate surrounds, including internal haul route

Soil landscape	Parent material	Australian Soil Classification	Erodibility
Brothers Soil Landscapes (br/bra)	Volcanics	Dermosols	Low-moderate
Maneroo Soil Landscapes (gum)	Volcanics	Dermosols	Low-moderate

(Source: NSW Office of Environment and Heritage, ESPADE website)

Brothers soil landscape

The Brothers soil landscape covers the elevated hill proposed to be quarried, comprising a rolling-steep volcanic peak and underlying volcanic plug (Tertiary volcanics- believed to be syenite-trachyte). This soil is formed on the most elevated part of the Project Site-generally above RL 900-1000m.

Slopes range from 20%-50%, with generally moderately deep (<60cm) to shallow, usually well-drained, variable profiles over the volcanic parent material. The soil profiles excavated on the Project Site in October 2017 reveal dark brown/chocolate to reddish brown clays and clay loam in the upper horizon trending back to a stony horizon at shallow to moderate depth. Refer accompanying profiles.The surface of the land is dominated by rocks and small boulders, getting larger nearer the top of the volcanic plug.

The qualities of this soil landscape include widespread rock outcrops, shrink swell characteristics with low strength when wet. They are generally stable with sufficient ground cover, with no evidence of any sheet or gully erosion encountered during site inspection.

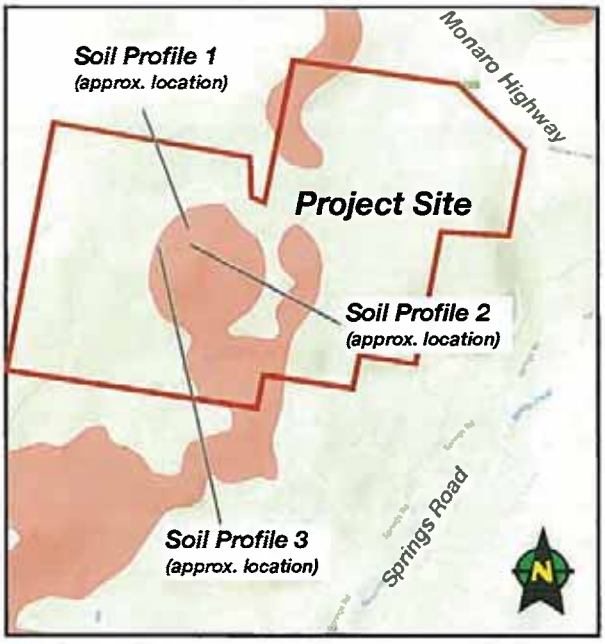


FIGURE 4.3: Distribution of Brothers Soils on Project Site approx. (highlighted red)

(Map Base Source: Office of Environment & Heritage ESPADE website + location of soil profiles excavated in October 2017)

Maneroo soil landscape

The Maneroo soil landscape covers the elevated crests and ridges, including the land proposed to be used for quarry infrastructure such as stockpiles and crushing plant, as well as the proposed quarry haul route. This soil landscape is derived from a basalt geology comprising undulating land on the ridge to the west of the proposed quarry, steeper slopes leading back to the east, and undulating land stretching back to the Monaro Highway on land below about RL 1000m.

Slopes range from 0-20%, with generally moderately deep (<40cm) to shallow, usually well-drained soil. The soil profiles excavated on the Project Site in October 2017 reveal dark brown/chocolate clay loam in the saddle of the hill to the west of the proposed quarry pit, with silty clay looms at the base of the hill, and with a stony, shallow reddish brown stony soil near the rail line. Refer to accompanying soil profiles. The land surface has minimal to no stone. These soils have shrink swell characteristics with low strength when wet. They are generally stable with sufficient ground cover, with no evidence of any sheet or gully erosion encountered during the October 2017 site inspection.

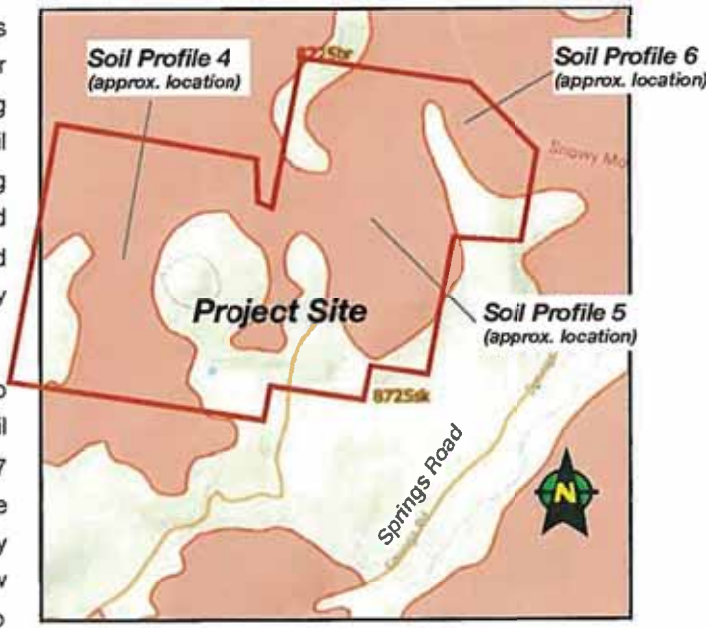


FIGURE 4.4: Distribution of Maneroo Soils on Project Site approx. (highlighted red)

(Map Base Source: Office of Environment & Heritage ESPADE website + location of soil profiles excavated in October 2017)

Soil Profile 1, near Drill Hole 3.

North-facing slope.

Moderate-steep land.

Approx. RL 998m AHD

Stony (basalt rock) dark brown clay loam upper soil horizon with lighter clay horizon below, trending back into stony soil at depth.

Brothers Soil Landscape.

Rocky land surface with tussock grassland.

Soil Profile 2, near Drill Hole 4.

North-facing slope, above Soil Profile 1.

Moderate-steep land.

Approx. RL 1,001m AHD

Stony (basalt rock) reddish brown upper soil horizon with lighter clay horizon below, trending back into stony soil at depth.

Note lighter clay horizon than Soil Profile 1.

Brothers Soil Landscape.

Rocky with less tussock grassland evident than at the (lower elevation) Soil Profile 1.

Soil Profile 3, near Drill Hole 6.

North-facing slope, to the west of Soil Profiles 1 & 2.

Steep to moderately steep land.

Approx. RL 995m AHD

Stony (basalt rock) brown clay loam upper & lower soil horizon with small amount of clay intermixed in the soil horizon below, trending back into stony soil at depth.

Near Brothers Soil Landscape/Maneroo Soil Landscape interface.

Rocky land surface with thicker tussock grassland than more elevated soil profiles 1 & 2.

Soil Profile 4.

In saddle of hill below steeper hill, to the west of Soil Profiles 1-3.

Rolling-undulating topography.

Approx. RL 990m AHD

Dark brown clay loam soil in upper and lower soil horizon with minimal stone content.

Maneroo Soil Landscape.

Rocky land surface with thicker tussock grassland than more elevated soil profiles 1 & 2.

Soil Profile 5.

At base of hill to the east, along proposed internal haul route.

Gently undulating land.

Approx. RL 940m AHD

Dark clay /silt loam in upper and lower soil horizon with minimal stone content. Appears to be much siltier soil than Soil Profile 4.

Maneroo Soil Landscape.

Less rocky land surface with less tussock grassland than more elevated soil profiles- possibly due to grazing activities.

Poorly drained.

Soil Profile 6.

Along proposed internal haul route, to east of the railway line.

Gently undulating land.

Approx. RL 910m AHD

Red/brown upper horizon, grading quickly into a stony (bauxite?) layer below.

Maneroo Soil Landscape.

Less rocky land surface than soil profiles in more elevated locations. Extensive tussock grassland.

Table 4.2: Features of the Soil Landscapes of the quarry site & surrounds

Soil Property	Brothers	Maneroo
Soil Hydrologic Group & Sediment Type	Group B, Type F (D where steeper slopes encountered)	Group C, Type F (D where fines encountered in soil profile, at lower elevations)
Urban capability, soil conservation earthworks	High limitations due to steepness. Generally moderate to high limitations for earthworks and foundation hazards. Subsoils may be rocky and generally have moderate volume expansion.	Moderate to high limitations. Generally moderate limitations for earthworks and foundation hazards. Subsoils can be rocky and generally have moderate volume expansion.
Limitations to rural land use- grazing, cultivation	Low limitations for grazing and high limitations for cultivation.	Moderate to high limitations for cultivation. Low limitations for grazing
Steep slopes	Widespread	Limited
Shallow soils	Moderate-deep soils	In more elevated sections and near highway
Soil fertility	High	High
Drainage	Well-drained, no water-logging observed, no flood hazard	Generally well-drained in elevated sections, good-poorly drained elsewhere, with no water-logging observed. Potential for localised flooding in lower sections
Erosion potential	No evidence of gully erosion or sheet erosion observed [NOTE: the 'Blue Book' classes the Brothers Soil Landscape as a 'high erosion hazard']	Localised gully/sheet erosion- near one watercourse only [NOTE: the 'Blue Book' classes the Maneroo Soil Landscape as a 'high erosion hazard']

(Source: NSW Office of Environment and Heritage- ESPADE website)

The soil landscapes of the quarry site and surrounds are generally stable in their natural condition.

However, vegetation clearing and earthworks and excavation of the land associated with quarrying may leave soils exposed to water and wind erosion, if not properly managed. This would include activities such as the excavation of the quarry site for allied uses such as stockpiles, the construction of access tracks, vegetation clearing and the construction of sediment basins. This assessment focuses on the soil and water constraints that need to be considered in relation to the factors considered in the 'Blue Book' (Landcom 2004) when determining appropriate erosion and sedimentation control measures on site.

Acid sulphate soils are not expected to present a problem on the Project Site because of its elevation and remoteness from estuarine sulphide-bearing mud, alluvial back swamps and alluvial plains that contain the potential for this type of soil. Almost all of the land has been cleared for decades. The land proposed for the new quarry has little or no erosion evident. It has been used in the past for the grazing of livestock. No intensive agriculture has been carried out on the proposed quarry site. There are no existing or former dip sites on, or within 200 metres of the proposed quarry site. There is no record of storage or disposal of chemicals upon the quarry site. Accordingly, the risk of potential soil contamination by toxic chemicals or bacteria is negligible.

4.2.2 Rural Land Capability

Land capability is the inherent physical capacity of the land to sustain long-term land-uses and management practices without degradation to soil, land, air and water resources. The following Rural Land Capability classification system is used to delineate the various classes of rural land, listed below.

- Land Suitable for Regular Cultivation/Cropping

Class I/1: No special soil conservation works or practices necessary.

Class II/2: Soil conservation practices such as strip cropping, conservation tillage and adequate crop rotations are necessary.

Class III/3: Soil conservation practices such as graded banks and waterways are necessary, together with all the soil conservation practices as in Class II.

- Land Suitable Mainly for Grazing

Class IV/4: Soil conservation practices such as pasture improvement, stock control, application of fertiliser, and minimal cultivation for the establishment or re-establishment of permanent pasture, maintenance of good ground cover.

Class V/5: Soil conservation works such as diversion banks and contour ripping, in addition to the practices in Class IV.

- Land Suitable for Grazing

Class VI/6: Not capable of cultivation. Soil conservation practices include limitation of stock, broadcasting of seed and fertiliser, promotion of native pasture regeneration, prevention of fire, destruction of vermin, maintenance of good ground cover and possibly some structural works.

- Land Suitable for Tree Cover

Class VII/7: Land best protected by trees.

- Land Unsuitable for Agriculture

Class VIII/8: Cliffs, lakes or swamps where it is impractical to grow crops or graze pasture.

Proposed quarry and surrounds

The Brothers soils are situated on generally steep land with with a Class 7 land capability, that is, not suitable for cropping or grazing, but to tree cover. This applies in particular to the most elevated sections, where there is widespread stone and boulders on the surface of the land- proposed to be worked as a quarry pit. The Maneroo soil landscape, found in lower hill slopes and the base of the hill, would have a Class 6 classification, suited to grazing only.

4.2.3 Agricultural suitability

The Agricultural Suitability system is used to classify land in terms of its suitability for general agricultural use. The most elevated part of the Brothers soil landscapes, comprising the proposed quarry extraction area, would be categorised as possessing a Class 5 agricultural suitability, defined as: *"Land unsuitable for agriculture, or at best suited only to light grazing. Agricultural production is very low or zero as a result of severe constraints, including economic factors which prevent land improvement."*

Lower sections of the Brothers soil landscape, and most of the Maneroo soil landscape, including the proposed quarry infrastructure area (stockpiles, crushing plant and access), would be categorised as possessing a Class 4 agricultural suitability, defined as:

"Land suitable for grazing but not for cultivation. Agriculture is based on native pastures or improved pastures established using minimum tillage techniques. Production may be seasonally high but the overall production level is low as a result of major environmental constraints."

4.2.4 Biophysical Strategic Agricultural Land (BSAL)

Biophysical Strategic Agricultural Land (BSAL) is land considered to be highly suitable for agriculture, having the best quality landforms, soil and water resources which are naturaly capable of sustaining high levels of productivity and require minimal management practices to maintain this high quality.

BSAL mapping has been provided at a state scale, used for the assessment of mining projects pursuant to *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* [NOTE: but not used for the assessment of proposed extractive industries].

Based on BSAL mapping for the locality, it would appear that some of the floodplain area to the south of the quarry site, within the Springs Creek alluvial plain, comprise Biophysical Strategic Agricultural Land.

The proposed quarry development, including internal haul route, does not affect any of the regionally mapped BSAL. Refer **Figure 4.5**.

FIGURE 4.5: BSAL land in vicinity of the Project Site

(Map Base Source: excerpt NSW Planning & Infrastructure State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 Strategic Agricultural Land Map -Sheet STA_027)

▪ 4.3 Land Use & Settlement Pattern

4.3.1 Snowy Monaro LGA

Overview

The Snowy Monaro local government area (LGA) is located in the Southern Highlands region of NSW, approximately 400km south-west of Sydney and 100km south of Canberra. The LGA covers approximately 15,158 square km and is predominately rural in character. Some 26.9% of the total LGA is protected within a national park or protected area. The Snowy Monaro Regional Council area is bounded by the Australian Capital Territory and the Queanbeyan-Palerang Regional Council area in the north, Eurobodalla Shire and Bega Valley Shire in the east, the Victorian border in the south, and the Snowy Valleys Council area in the west. Rural land is used largely for agriculture- particularly sheep and cattle grazing- and timber production. Tourism is an important industry, particularly during the ski season, with trout fishing also being a major attraction.

The main urban centres in the LGA is Cooma with a population of 7,527 people- the 'gateway' to the Snowy Mountains ski fields. Snowy Monaro Regional Council area's Gross Regional Product is estimated at $1.09 billion, with accommodation and food services-much of this linked to ski fields-related tourism- being the largest industry. During peak tourist (snow) season, the population of the area increases significantly, as does the workforce. The Snowy Monaro LGA also has smaller townships and villages at Adaminaby, Berridale, Bombala, Bredbo, Cathcart, Dalgety, Delegate, Jindabyne, Michelago, Nimmitabel and Numeralla. Several ski resorts are located in the area. Cooma is the nearest major urban centre to the proposed quarry, located approximately 12 km to the north on the Monaro Highway. The closest small settlement to the quarry is at Nimmitabel (population of 326 persons-2011 source: Cooma-Monaro Shire Council *Cooma-Monaro Settlements Strategy 2016-2036 – Discussion Paper* December 2015).

Population

The (ABS) 2016 Estimated Resicent Population for Snowy Monaro Regional Council area is 20,617 persons. There has been only modest growth in the population of LGA over the last decade, with the estimated permanent population increasing from 20,008 persons in 2006 to the current (2016) estimated population of 20,617. Forecasts suggest that this trend will continue into the near future (Department of Planning & Environment 2016 *NSW State and Local Government Population and Household Projections, and Implied Dwelling Requirements*), with forecast annual growth in population of 0.1% between 2011 and 2036, equivalent to a total growth for that period of only 2.4%.

Table 4.3: Population & projected population growth Snowy Monaro LGA 2011-2036

Totals	2011	2016	2021	2026	2031	2036
Total Population	20,400	20,750	21,100	21,350	21,500	21,550
Total Households	8,350	8,700	8,950	9,150	9,350	9,450

(Source: Department of Planning & Environment 2016 *NSW State and Local Government Population and Household Projections, and Implied Dwelling Requirements*)

The Project Site forms a part of a census collection district referred to by the ABS as 'Rural Central', an area covering 249,253ha- refer ***Figure 4.6***. The 2016 estimated resident population of 1,262 persons is little changed from that recorded in 2011, with a population density reflecting the sparse population in this area, of only 0.01 persons/ha.

Community profile

In 2016, the largest age cohort in the Snowy Monaro LGA was in 35-49 year age group- described by the ABS as 'Parents and home builders' (19.5% of the population), followed by those in the 50-59 year age group - described by the ABS as 'Older workers and pre-retirees' (15.3% of the populaton) and then 60-69 year age group - described by the ABS as 'Empty nesters and retirees' (13.2% of the population) followed by 25-34 year age group - described by the ABS as 'Young workforce' (11.1% of the population) and then by 70-84 year age group - described by the ABS as 'Seniors' (10.4% of the population). Refer Table 4.4.

Table 4.4: Age structure changes Snowy Monaro LGA between 2011-2016

Age group (years)	2016 number of persons	2016 % of populatio n	2011 number of persons	2011 % of population	Change 2011 to 2016
Babies and pre-schoolers (0 to 4)	959	4.7%	1,154	5.9%	-196
Primary schoolers (5 to 11)	1,799	8.9%	1,708	8.7%	+91
Secondary schoolers (12 to 17)	1,412	7.0%	1,708	8.7%	-296
Tertiary education & independence (18 to 24)	1,545	7.6%	1,367	7.0%	+177
Young workforce (25 to 34)	2,236	11.1%	1,996	10.2%	+239
Parents and homebuilders (35 to 49)	3,951	19.5%	4,398	22.4%	-448
Older workers and pre-retirees (50 to 59)	3,096	15.3%	2,953	15.0%	+143
Empty nesters and retirees (60 to 69)	2,665	13.2%	2,350	11.9%	+314
Seniors (70 to 84)	2,100	10.4%	1,655	8.4%	+445
Elderly aged (85 and over)	460	2.3%	379	1.9%	+81
TOTAL	20,223	100%	19,672	100%	+550

(Source: Australian Bureau of Statistics website, Census of Population and Housing 2011 and 2016. Compiled and presented by .id, the population experts)

Significantly, the underlying trend in age groups living in the LGA is a pronounced ageing of the population, with the biggest increases in population between 2011 and 206 being in the following:

- 'Seniors' 70-84 years.
- 'Empty nesters and retirees' 60-69 years.
- 'Older workers and pre-retirees' 50-59 years.
- Small increases in the population in the 5-11 years age group ('Primary schoolers'), 18-24 years ('Tertiary education and independence') and 20-34 years (('Young workforce').

The population increase in 'Seniors', 'Empty nesters and retirees' and 'Older workers and pre-retirees' age groups accounted for an LGA population growth of 902 persons, equivalent to 4.5% of the 2011 LGA population. During the 2011-2016 period the greatest population decline was registered in the 'Parents and home builders' age group, a decline of 448 persons or 2.27% of the 2011 LGA population. The next highest population decline was in the

'Secondary schoolers age group, a decline of 296 persons, or 1.5% of the 2011 LGA population. Employment by industry sector

The most common industry sector of employment in the Snowy Monaro LGA in 2011 were 'Accommodation and Food Services' (13.2%), 'Agriculture, Forestry and Fishing' (10.5%) and 'Retail Trade' (10.3%). In combination, these three industries employed 3,206 people in total or 34.0% of the total employed resident population. The most significant increases in industry sector employment between 2006 and 2011 were in the 'Public Administration and Safety', 'Arts and Recreation Services', 'Education and Training' and 'Health Care and Social Assistance'. The most significant reduction in industry sector employment between 2006 and 2011 was in 'Agriculture, Forestry and Fishing', the proportion of persons engaged in this sector shrinking from 11.7% of the workforce in 2006 to 10.5% in 2011.

4.3.2 The locality & 'Rural Central'

Community profile

The Project Site, including Rock Flat, forms a part of the census district described by the ABS as 'Rural Central', which also includes the nearest village, at Nimmitabel. Rural Central is a predominantly rural area, with villages also at Dalgety and Numeralla. Land is used largely for agriculture. Refer **Figure 4.6**.At the 2016 census the population of Rural Central was 1,241, living in 751 dwellings with an average household size of 2.34.

The population of Nimmitabel at the 2016 census was 320 persons. From 2011 to 2016, Rural Central's population decreased by 51 people (4.1%).

FIGURE 4.6: ABS 'Rural Central' (shaded grey) & Project Site

(Map Base Source: ABS website, map compiled by .id, the population experts)

This represents an average annual population change of -0.83% per year over the period.The ABS data shows that Rural Central had a lower proportion of pre-schoolers and a higher proportion of persons at post retirement age than Snowy Monaro Regional Council LGA in 2016. The largest age cohort living in Rural central are 'parents and homebuilders' (19.9% of the population), followed closely by those in the 50-59 year age group - described by the ABS as 'Older workers and pre-retirees' (17.1% of the population) and then 60-69 year age group - described by the ABS as 'Empty nesters and retirees' (16.2% of the population), followed by 70-84 year age group - described by the ABS as 'Seniors' (13.7% of the population). The rural area had a much larger aged population than that for the Snowy Monaro LGA in 2016.

Notably, Rural central had a smaller percentage of 'Young workforce (25 to 34)' compared to the Snowy Monaro LGA (5.2% compared to 11.1% in the LGA).Overall, 31.0% of the Rural central population were aged 60 years and over, compared with 25.8% for Snowy Monaro Regional Council LGA. Significantly, more Rural Central residents worked in agriculture, forestry and fishing than any other industry in 2011. This industry sector alone employed 192 people in total, or 31.9% of the total employed resident population.

This was followed by employment in 'Retail Trade' (9.0%) and 'Public Administration and Safety (8.9%). In combination, these three industries employed 300 people in total, or 49.8% of the total employed resident population. The proportion of persons employed in agriculture, forestry and fishing was about three times the LGA average (31.9% compared to 10.5% for the Snowy Monaro LGA). The most marked increases in industry sector employment between 2006 and 2011 were in the 'Administrative and Support Services', 'Public Administration and Safety', 'Education and Training' and 'Health Care and Social Assistance', with significant declines in persons engaged in 'Agriculture, Forestry and Fishing', 'Wholesale Trade' and 'Rental, Hiring and Real estate Services'.

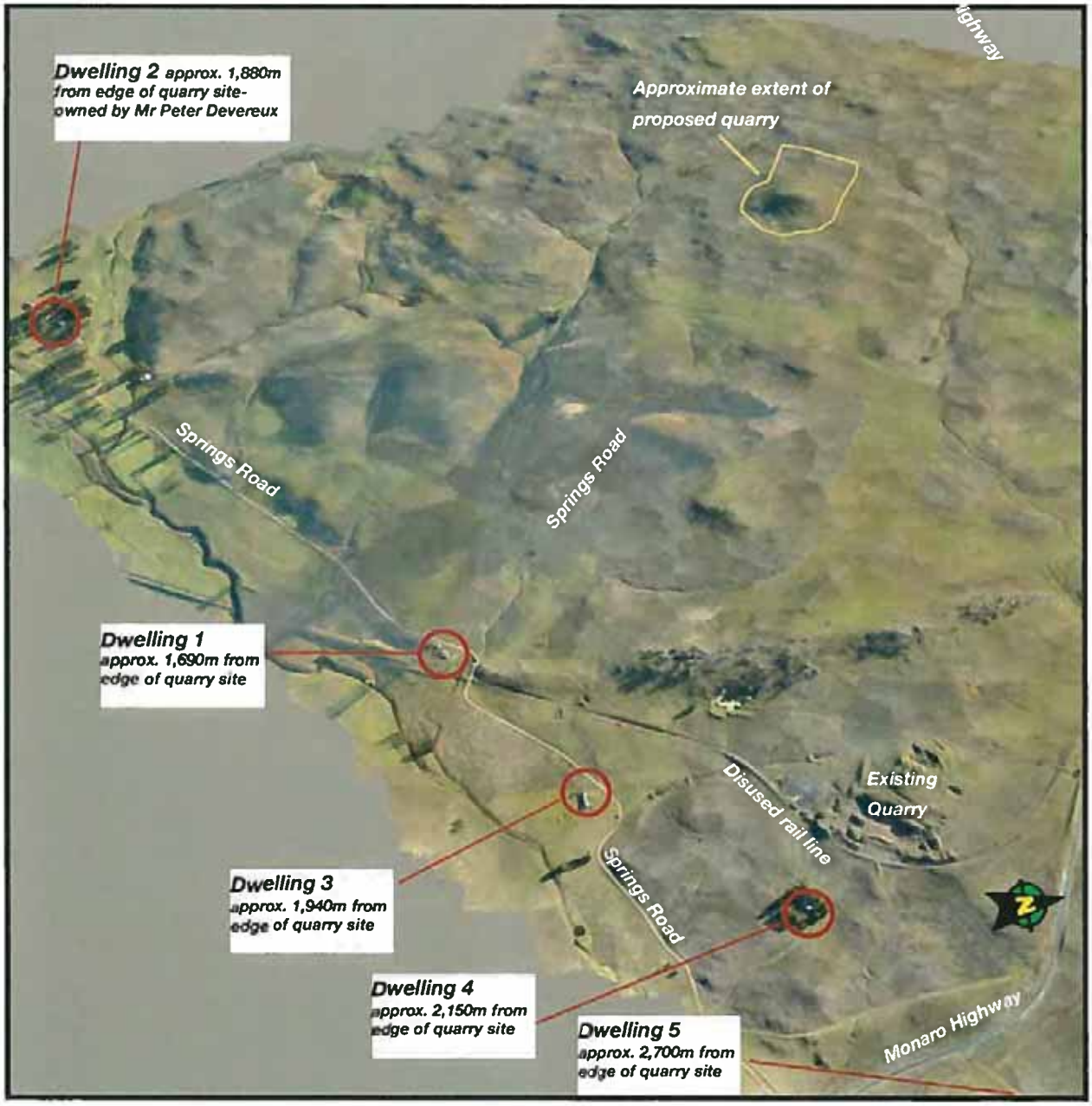


FIGURE 4.7: Oblique aerial photo of nearest residences in vicinity of the proposed quarry, viewed from the north-east looking back towards the proposed quarry site

(Map Base Source: Composite 3D aerial from drone photography commissioned by Schmidt Quarries 2017
NOTE: Dwellings 5, 6 & 7 fall outside of the drone survey coverage area. Quarry footprint approx. only)

Project Site and surrounds

The quarry site forms a part of a larger rural holding, totalling some 2,000ha, owned by Mr Peter Devereux, and includes the historic 'Milton Park' homestead, near the end of Springs Road (Dwelling 2 in **Figures 4.1, 4.7 & 4.8** above). The proposed quarry is located in a sparsely populated rural area, with rural dwellings set well back from the area proposed for quarrying and quarry-related infrastructure works. Lands surrounding the Project Site are used for:

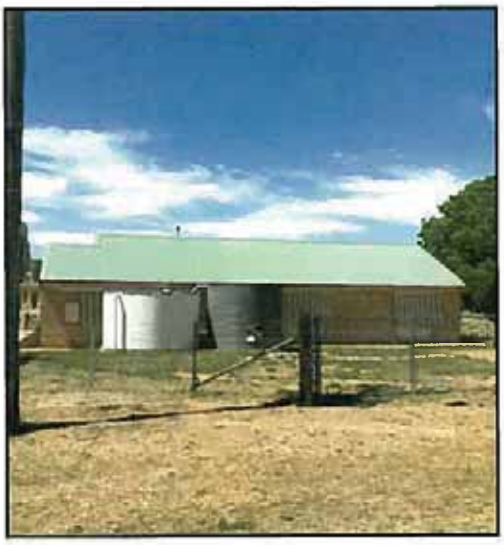
- Predominantly agricultural grazing lands surrounding the Project Site- principally the grazing of sheep. Some cropping of the alluvial area adjacent to Springs Road is also carried out. There are no significant stands of trees to be found in the near locality- most tree stands surrounding existing rural dwellings- with cleared grasslands predominating.

- Rural dwellings associated, in the main, with the farming holdings in the locality. The nearest dwellings to the proposed quarry, including the owned by Mr Peter Devereux, are illustrated in **Figure 4.1, 4.7** and **Figure 4.8**. Excluding the rural homestead owned by Mr Devereux, on Springs Road (Dwelling 2), there are only two (2) other rural dwellings within 2km of the proposed quarry operation, only one (Dwelling 1) with potential views back to the elevated knoll proposed to be quarried- and even these potential views are compromised by the existing screening of the house and placement of water tanks. Another dwelling is located approximately 2,.15km from the edge of the proposed working quarry, however, it is screened from view of the quarry by plantings (Dwelling 4). A further additional rural dwelling, located approximately 2.7km away, also has a view only of the peak on the knoll (Dwelling 5). Dwellings 6 and 7 have no views of the knoll/quarry area. Details of these rural dwellings are summarised in the accompanying Table 4.5. Refer also to Section 1.3 of the EIS regarding consultation with these owners. Refer to Vipac noise report for location of more distant rural dwellings, generally to the west.

- The proposed internal quarry haul route proposes to cross a disused rail line. There are no rural dwellings located proximate to the proposed internal quarry haul route.

- An abandoned mine is to be found on the southern side of Springs Road near the intersection with the Monaro Highway. The rehabilitation of this old mine falls well short of mining 'best practice' rehabilitation methods.

- An operating quarry is to be found on the northern side of Springs Road near the intersection with the Monaro Highway. It is understood that the quarry is a lawful operation, however, little or no attempt has been made to either extract from any single, predefined pit or to rehabilitate the land the subject of earlier workings. It is understood that this quarry has not operated for some years however it has not been rehabilitated.



PHOTOGRAPHS: Nearest rural dwellings on Springs Road- Dwelling 1 (left hand photograph) and Dwelling 3 (right hand photograph). Refer Figures 4.7 & 4.8 *(October 2017 photography)*

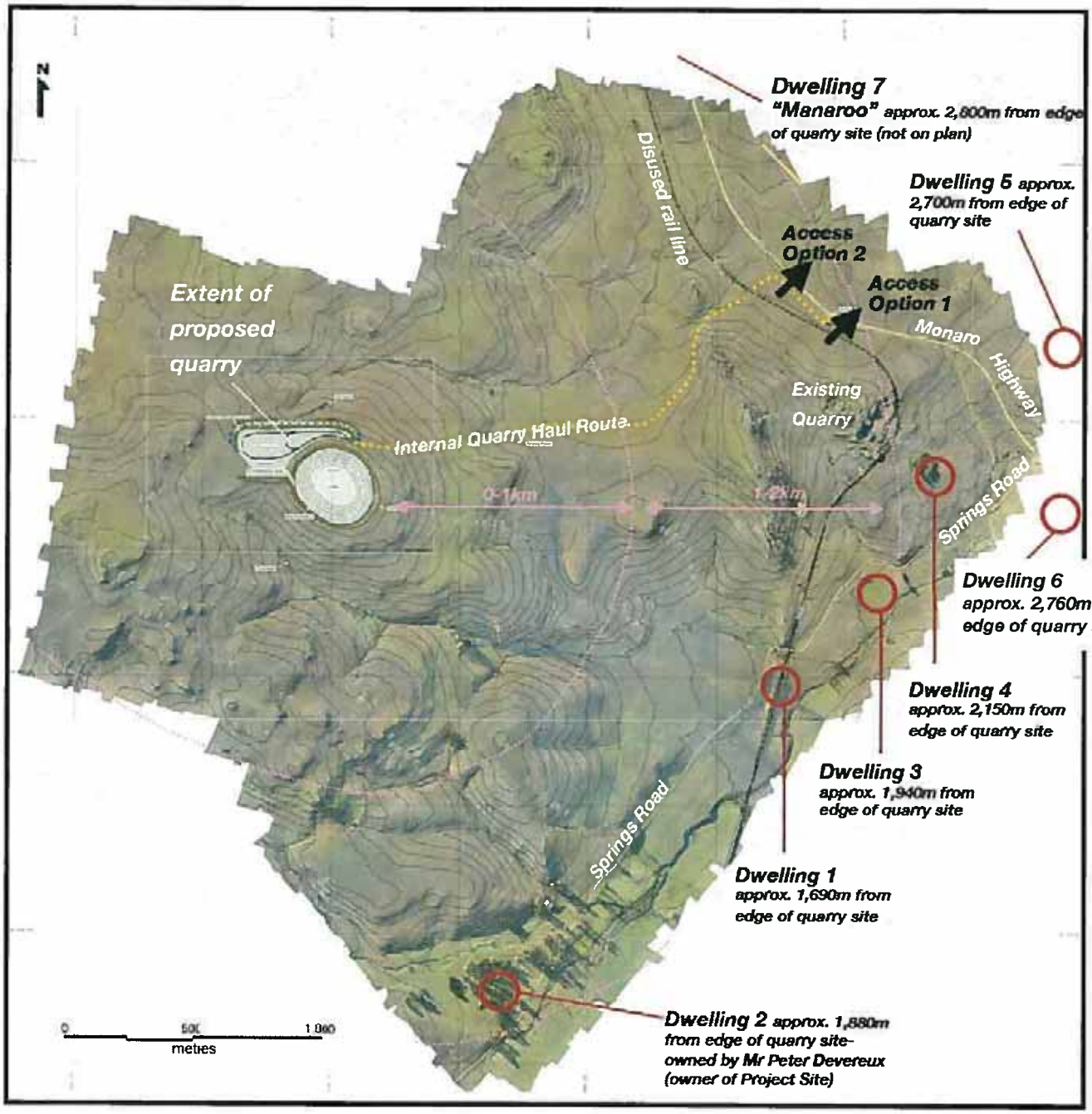


FIGURE 4.8: Aerial photo of nearest residences in vicinity of the proposed quarry

(Map Base Source: Aerial drone photography commissioned by Schmidt Quarries 2017

NOTE: Dwellings 5, 6 & 7 fall outside of the drone survey coverage area)

Table 4.5: Details of rural dwellings nearest to proposed quarry site

Rural dwelling- refer to Figure 4.7 and Figure 4.8 for location	Features, visibility of the knoll from dwelling
Dwelling No. 1: Lot 1/2 DP 837551 Springs Road, Rock Flat. Rural dwelling located approx. 1,690m from edge of quarry site	Potential for views of the knoll from residence, however, partially obscured by window blinds and water tanks on northern side of the residence facing Springs Road. Views of the highest parts of the knoll are possible from the grounds of this property away from the dwelling. Views of nearby existing quarry workings and abandoned former mine have an impact on the rural outlook from this dwelling
Dwelling No.2: Lot 6 DP 750540 Springs Road, Rock Flat. Historic 'Milton Park' rural homestead- heritage item. Located approx. 1,880m from edge of quarry site	No views are possible of the knoll from homestead- obscured by intervening vegetation and hills, however views of the knoll are possible from the property further north-east of homestead. Owned by same owner as for Project Site, Mr Peter Devereux
Dwelling No.3: Lot 3/4 DP 758883 Springs Road, Rock Flat. Rural dwelling located approx. 1,940m from edge of quarry site	Obscured/heavily screened views of the knoll due to intervening vegetation and garage on north side of dwelling. Views of nearby existing quarry workings and abandoned former mine have an impact on the rural outlook from this dwelling
Dwelling No.4: Lot 2 DP 825408 Springs Road, Rock Flat. Rural dwelling located approx. 2,150m from edge of quarry site	No views are possible of the knoll- obscured by intervening ridge
Dwelling No.5: Lot 3 DP 825408 Monaro Highway, Rock Flat. Rural dwelling located approx. 2,700m from edge of quarry site	Views only of the uppermost peak of the knoll only, with the remainder of the knoll obscured by intervening ridge
Dwelling No.6: Lot 7302 DP 1164218 & Lot 49 DP 750537 Monaro Highway, Rock Flat. Rural dwelling located approx. 2,760m to E of edge of quarry site	No views are possible of the knoll- obscured by intervening ridge and vegetation running along the creek to the immediate west of dwelling
Dwelling No.7: Lot 65, 68 & 109 DP 750540 Monaro Highway, Rock Flat. Rural dwelling located approx. 2,800m to NE of edge of quarry site	No views are possible of the knoll from rural dwelling at this address- obscured by intervening ridge. Views of the knoll are possible from the grounds of this property, away from the dwelling

There are no known tourist attractions or facilities within 2 km of the site- the abandoned mine and former adjoining springs no longer considered to be an 'attraction' as such.There are no known public open space or related facilities within 2 km of the site, nor are there any other concentrations of population within this distance. The nearest urban settlement to the Project Site is at Nimmitabel, approximately 12km away to the south.

The land proposed for the quarry pit contains extensive areas of exposed surface rock, and has no practical value to agriculture. The Boco Rock Wind Farm is situated on ridge lines approximately 13-14km south west of the Project Site. The wind farm's 67 turbines generate up to 113MW of renewable energy. Wind farms generate a clean, renewable source of electricity and play an important role in reducing global greenhouse gas emissions. For Boco Rock Wind Farm that means the equivalent of approximately 50,000 houses will be supplied with clean energy.

The proposed quarry will utilise an existing, registered level crossing that crosses the existing disused rail line near the Monaro Highway.

The rail line running through the Project Site was closed by the State Government in the 1980s and is currently in a poor state of repair. In 2016 the local council had looked into reopening the rail line. In this regard, the most recent advice from Snowy Monaro Regional Council, dated 17 March 2017 and forming a part of the issued SEARS is as follows:

> *"Council is at present exploring possibilities for reactivation of the railway line in some way, whether for transport or tourist uses or both and this may occur over the predicted life of the quarry. The EIS should be written with the possibility that the railway line may re-open at some point during the life of the quarry. This may require particular consideration of the design of the railway crossing on the access route to the quarry as well as any potential vibration or dust impacts."*

Under s.99A of the *Transport Administration Act 1988* a railway line cannot be closed unless authorised by an Act of Parliament [NOTE: a more liberal interpretation of this provision was recently decided in the Court of Appeal decision in Hunter Development Corporation v Save Our Rail NSW Incorporated [2015] NSWCA 346]. s.99 of the *Transport Administration Act 1988* states that "*A rail infrastructure owner is not required to maintain a railway line on which no services are operated.*"

The disused rail line is owned by Transport for NSW (TfNSW), who may provide persons with access under the current NSW rail access undertaking to the part of the NSW rail network vested in or owned by TfNSW and that is not subject to an ARTC lease or licence (no such lease of licence applies in the case of the disused rail line here).

In October 2017 Schmidt Quarries contacted John Holland, acting for the Country Regional Network on behalf of the land owner of the rail line, TfNSW. John Holland have since verbally advised that the crossing is a registered crossing and can be used by the quarry, subject to the existing rail iron and joining plates being removed prior to use for quarry truck traffic (advice David Schmidt 24 November 2017).

PHOTOGRAPH: Existing disused rail line on the Project Site, near existing rail crossing
(October 2017 photography)

4.3.3 Other quarries operating in the region

In Section 2.2.3 details were provided of the market area for the proposed quarry (and current market for Schmidt Quarries' Nimmitabel quarry products). The following details are provided of existing quarries in the region.

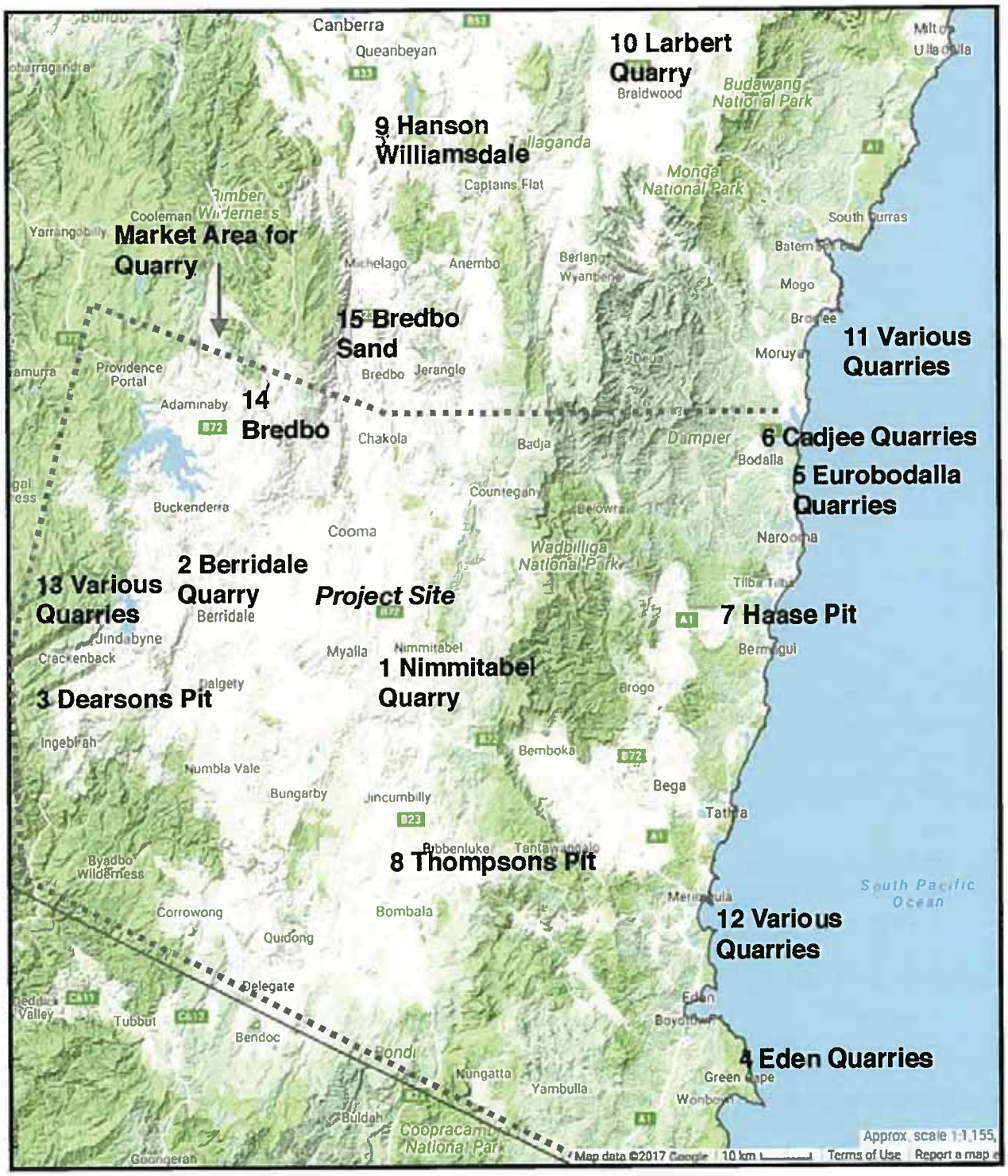


FIGURE 4.9: Quarries operating in the region & market for quarry

(Map Base Source: ESPADE with information on quarries supplied by Schmidt Quarries 2017)

Table 4.6: Quarries operating in the region- refer Figure 4.9 for locations

Location & name of quarry	Quarry operator	Quarry material	Comments, estimated quarry production
1. Nimmitabel Quarry	**Schmidt Quarries**	**Basalt hard rock**	**High grade, 2nd largest quarry in the market area (not including Canberra) 170,000 tonnes pa +**
2. Berridale Quarry	Edwin Kraft	Metamorphic siltstone	Low volume, medium grade road base product
3 Dearsons Pit	Rye Plant Hire	Granite hard rock	Low volume, little resource remaining, medium quality
4 Eden Quarries	Eden Quarries	Granite hard rock	Medium volume, medium quality resource
5 Eurobodalla Quarries	Troy Hollis	Basalt hard rock	Medium volume, reasonable quantity and quality, on fringe of market area
6 Cadjee Quarries	Cadjee Quarries	River gravel	Low volume, reasonable quantity and quality
7 Haase Pit	Batemans Bay Sand and Gravel	Metamorphic silt stone	Low volume, medium grade road base product
8 Thompsons Pit	Boral	Basalt hard rock	Not operating, high grade basalt
9 Williamsdale Quarry	Hanson	Granite hard rock	Very high volume, high quantity, servicing the Canberra and Sydney markets
10 Larbert Quarry, Braidwood	Schmidt Quarries	Metamorphic siltstone	Medium volume, medium grade road base product
11 Batemans Bay Area	Various operators		Various quarries, this is at the fringe of the market area for the new quarry site
12 Bega Eden Area	Various operators		3 sand extractions operations, not in same market as proposed new quarry
13 Jindabyne Area	Various operators		2-3 low grade decorative granite pits, not in same market as proposed new quarry
14 Bredbo Corkhills	Corkhills	River gravel	Low volume, mainly marketed back to Canberra
15 Bredbo Sand	Buzza	River sand	Low volume, mainly marketed back to Canberra

(Source: Schmidt Quarries)

Schmidt Quarries Nimmitabel quarry operation is currently the largest quarry operating within the market area.

[NOTE: The Williamsdale Quarry, which has a higher output, services the Canberra and Sydney markets, not the market serviced by the Nimmitabel quarry.] Schmidt Quarries' Braidwood quarry (Larbert Quarry) lies outside often market area. All other quarries providing similar quality quarry material are either much smaller operations or on the fringes of the market area.

4.4 Climate, Noise Environment

4.4.1 Climate

The Monaro Plain is characterised by a sub-alpine climate, with long cold winters and temperatures regularly falling below freezing.

The Monaro Plain also has a low and variable rainfall due to the rain shadow effect from the Snowy Mountains, to the west, and the coastal ranges, to the east. Refer **Figure 4.10.**

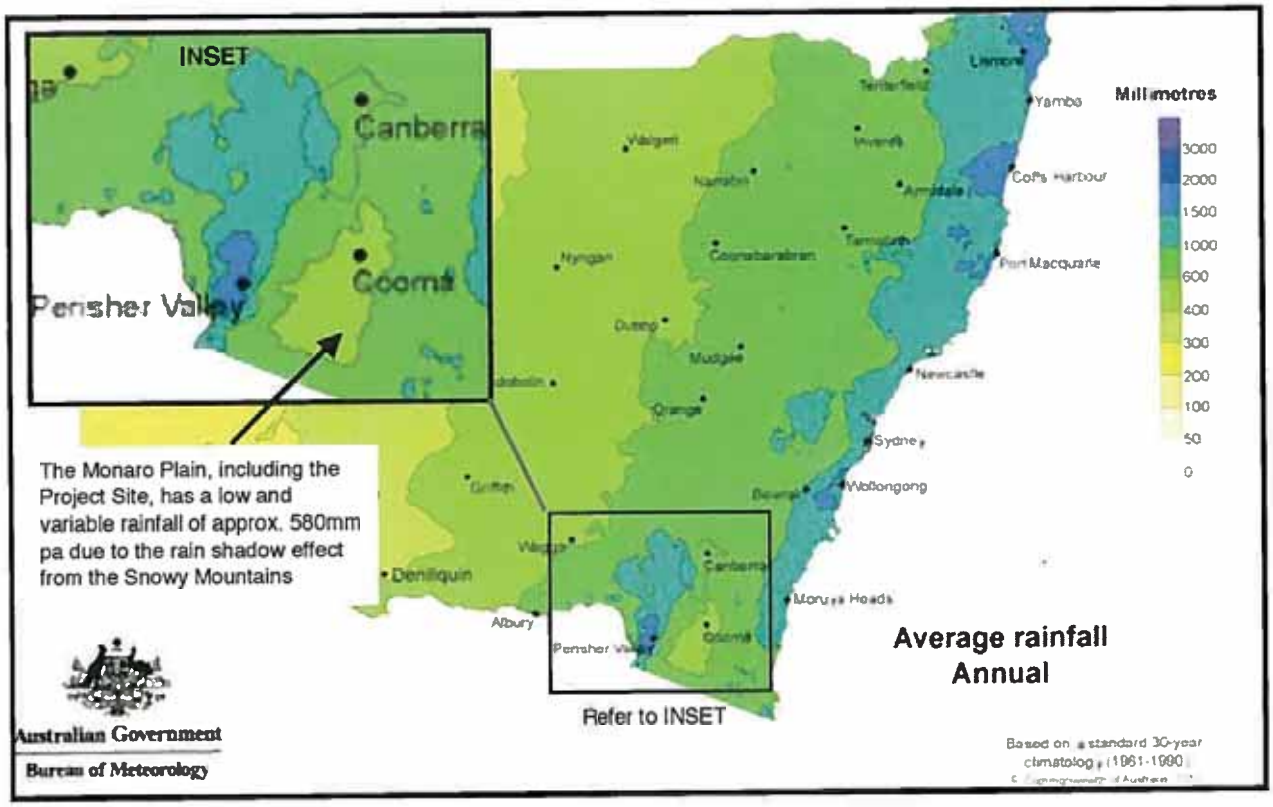


FIGURE 4.10: Annual average rainfall for region

(Map Base Source: BoM website November 2017)

The Project Site lies almost mid-way between the official Bureau of Meteorology observation sites is at Nimmitabel (Station No 70067 elevation of RL1,075m), more than 12km to the south, and Cooma Visitors Centre (Station No 70278 elevation of RL778m), more than 14km to the north. Rainfall at the Project Site would be closer to that encountered at Cooma than at Nimmitabel, based on climate modelling using monthly climate surfaces interpolated from Bureau of Meteorology weather stations (source: Ross 2013). The nearest modelled site, having an average annual rainfall of 582.9mm, lies at an elevation of RL1,000m on the Monaro Plain near Myalla- comparable to that of the proposed quarry site- located approximately 8km to the south-west.

The length of the winter dry period is a key feature in the Monaro Plain, lasting from April until September. In winter, snowfalls are common on the Monaro Plain ranges above RL1,200 m, and may occur as low as RL500m.

A summary of climate data for both locations from the Bureau of Meteorology (BoM) is presented in the accompanying Table 4.7.

Table 4.7: Annual weather conditions Nimmitabel and Cooma BoM Stations

Weather conditions	Nimmitabel	Cooma
Annual rainfall	694.3mm	548.4mm
Highest monthly rainfall	68.3mm (January)	63.6mm (November)
Lowest monthly rainfall	45.7mm (August)	27.4mm (August)
Annual minimum/maximum temperature	3.4ºC/15.6ºC	4.1ºC/19.4ºC
Highest mean monthly maximum temperature	22.8ºC (January)	27.3ºC (January)
Lowest mean monthly minimum temperature	-1.9ºC (July)	-2.7ºC (July)

(Source: BoM website November 2017)

No wind records are available for the Nimmitabel BoM station, however, wind records are available for Cooma Visitors Centre for 9.00am and 3.00pm observations- refer to accompanying **Figure 4.11**. The area is notable for its winds- hence the attraction of the area to wind turbine projects lie that at nearby Boco, to the south west.

9.00am winds

3.00pm winds

FIGURE 4.11: Annual winds for region

(Map Base Source: BoM website November 2017)

Wind records from the Cooma Visitors Centre Bureau of Meteorology observation station show winds from almost all vectors in the mornings (9.00am), with strongest winds from the W, NE and SW wind vectors. Afternoon winds (3.00pm) are more pronounced from the W, NE and SW wind vectors. As the proposed quarry site sits at a higher elevation (RL850m up to RL1,035mm) than the Cooma Visitors Centre site (RL778m) wind speeds are likely to be similar or even stronger than those experienced at the Cooma Visitors Centre observation site.

4.4.2 Existing Noise, Air Environment

In general, the local environmental setting can be characterised as rural with little dust generation activities present except that generated by the existing quarry, located near the intersection of Springs Road and the Monaro Highway, or arising from local agricultural operations. The only permanent noise source in the local area is that generated from traffic using the Monaro Highway and from intermittent use of the quarry. The acoustic environment and noise impacts are assessed in more detail in Section 5 of the EIS.

▪ 4.5 Landscape

The landscape character and visual significance of a property needs to be considered in the context of a range of factors, including landscape features, visual prominence and context in the overall landscape. The general visual character of land is established through an assessment of its topographic characteristics, land use and settlement pattern, ability to be viewed by others and vegetation cover.

4.5.1 Visual Assessment Criteria

The aim of the landscape and visual impact assessment is to identify, evaluate and predict potential key visual impacts arising from the proposed quarry development. The assessment of visual impact combines sensitivity with predicted magnitude of change to establish the significance of residual landscape and visual effects. The visual impact of the proposed quarry is assessed in detail in Section 5.6 of the EIS. Landscape sensitivity relates to the nature of the landscape itself, its scenic qualities, and sensitivity to change. Visual sensitivity is the ability of the landscape to be seen by others and and sensitivity to change. Refer accompanying Table 4.8.

Table 4.8: Landscape and visual sensitivity criteria

Sensitivity Class	Landscape Sensitivity Criteria	Visual Sensitivity Criteria
High	Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character.Landscape designated for its international or national landscape value. Outstanding example in the area of well cared for landscape or set of features	Dwellings with views orientated towards the proposed development. Users of outdoor recreational facilities, on recognised national cycling or walking routes or in national designated landscapes
High-Medium	Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character. Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent. Good example in the area of reasonably well cared for landscape or set of features	Road users in nationally designated landscapes or on recognised scenic routes, likely to be travelling to enjoy the view. Users of outdoor recreational facilities, in locally designated landscapes or on local recreational routes that are well publicised in guide books
Medium	Landscape characteristics or features with moderate capacity to absorb change without fundamentally altering their present character Landscape designated for its local landscape value or a regional designated landscape where the characteristics and qualities that led to the designation of the area are less apparent or are partially eroded or an undesignated landscape which may be valued locally. An example of a landscape or a set of features which is neutral or mixed character	Dwellings with oblique views of the proposed development. Users of primary transport road network, orientated towards the development, likely to be travelling for other purposes than just the view.

Medium-Low	Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character. Usually of little local landscape value. An example of an un-stimulating landscape or set of features	Primary transport road network users likely to be travelling to work with oblique views of the development or users of minor road network
Low	Landscape characteristics or features which are tolerant of change without detriment to their present character. Usually of little local landscape value. An example of monotonous unattractive visually conflicting or degraded landscape or set of features	Road users on minor access roads travelling for other purposes than just the view. People engaged in work activities indoors, with limited opportunity for views of the development

The visual quality of a site can be assessed in terms of the relative scenic quality of that landscape and the degree of visual prominence.Scenic quality is determined by classifying the natural landscape features into three classes on the basis of their variety. These are as follows:

High Scenic Quality	-	Distinctive Variety
Moderate Scenic Quality	-	Common Variety
Low Scenic Quality	-	Minimal Variety

The method of classification is based on the assumption that scenic quality increases as relief and topographic ruggedness increases, vegetation become more diverse, natural and agricultural landscapes increase and altered landscapes decrease. The accompanying Table 3.2 summarises the variety class characteristics for a rural landscape in the surrounding area. It is noteworthy that usually at least two variety class characteristics are required to be present in a landscape for it to be of that class.

Table 4.9: Landscape Features and Variety Classes

Landscape feature	Distinctive	Common	Minimal
LANDFORM	Rolling to steep terrain with slopes 15%or more Escarpments, cliffs	Undulating terrain, slopes 0% - 15%	Plains, Swamps, flat terrain, slopes 0% - 3%
LAND COVER	Strongly defined patterns of vegetation, e.g. forest greater than 10m in height	Predominantly cleared with trees along watercourses. Grazing and pasture	Cleared areas, grasslands or hard, paved surfaces

Landscapes with a High Scenic Quality includes landform or land cover of outstanding, unusual, distinctive or diverse character. Moderate Scenic Quality landscapes includes landform or land cover which tend to be common throughout the region and are not outstanding in visual quality. Landscapes with a Low Scenic Quality include those areas with features of minimal diversity or variety and includes all areas not found under the other classes. The steeper areas on theProject Site possess a Medium Scenic Quality, with the lower lying areas possessing a Low Scenic Quality. The elevated knoll possesses a Medium Visual and Landscape Sensitivity when viewed from Dwelling 1, with a Medium-Low Visual and Landscape Sensitivity from other viewing locations- including from the Monaro Highway.

4.5.2 Landscape Context

Related to the above, and as a basic visual assessment principal, any type of development in the landscape will become less perceptible the greater the distance that the viewer is removed from the development. In other words, this equates to a reduction in the significance of potential visual impacts as one moves further away any development.

For predominantly surface topography-based quarry developments, which do not result in the introduction of high vertical structures, the following distance categories have been adopted- refer to accompanying table.

Table 4.10: Landscape Distance

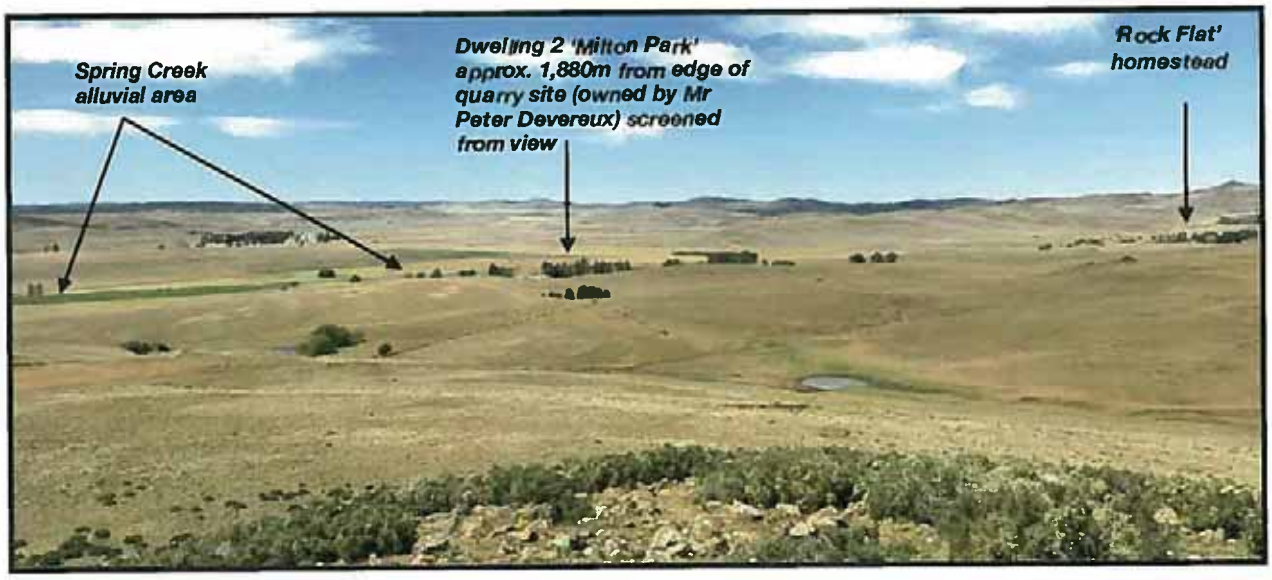
Viewpoint Distance	Features seen from that viewpoint distance
0-2km	A site located approximately 2km or less from a viewer is considered close enough to allow identification of significant detail. Any positions within this range with open uninterrupted views of a development would generally receive the greatest visual impacts [NOTE: Only 3 dwellings within 2km of the quarry site, one (1) by Mr Peter Devereux, the owner of the Project Site]
2-5km	At this distance, visibility of a development site becomes more general, with viewers in open uninterrupted positions able to identify general form, colour/tone and textural contrast, but losing the more focused detail achievable from closer positions. Effects at this distance are generally less than those found between 0-2km. Only nearby Dwelling 5, located 2.7km away, has views of the quarry site-but only of uppermost peak of the knoll. Nearby dwellings 4,6 and 7, located within 3km of the quarry site, do not have views of the quarry site. Views possible of knoll from Monaro highway to the south until approx. 3km away
5-15km	Beyond 5km visual prominence of a development site quickly diminishes. The development increasingly becomes part of the general background/distance views. Intermittent views of quarry from Monaro Highway to the south from 10km away to approx. 3km away. Glimpses only from Monaro Highway to the north

A detailed visual appraisal has been undertaken for the Project Site and surrounds, to establish the approximate visibility of the proposed quarry site from any surrounding receptors in the vicinity, including from key vantage points on the Monaro Highway proximate to and at a distance from the Project Site. The visual impact of the proposed development from these key viewpoints is assessed in section 5.6.2 of the EIS.

The landscape context is appraised in the following. Photographs were taken from the top of the hill on the proposed quarry site in order to provide some context in terms of the landscape of the surrounding area and visibility of the proposed quarry site from surrounding areas. This baseline analysis in this section of the EIS of the available views and the surrounding landscape is supported by a series of photo viewpoints.

Viewpoint A (refer to Figure 4.12)

Taken from the peak of the knoll on the proposed quarry site, looking to the south, towards 'Milton Park' homestead, owned by Peter Devereux, the owner of the Project Site [NOTE: This homestead is shielded from view by stands of trees]. The view takes in the ridge line forming a part of the Monaro Range, some 7-10 km away.

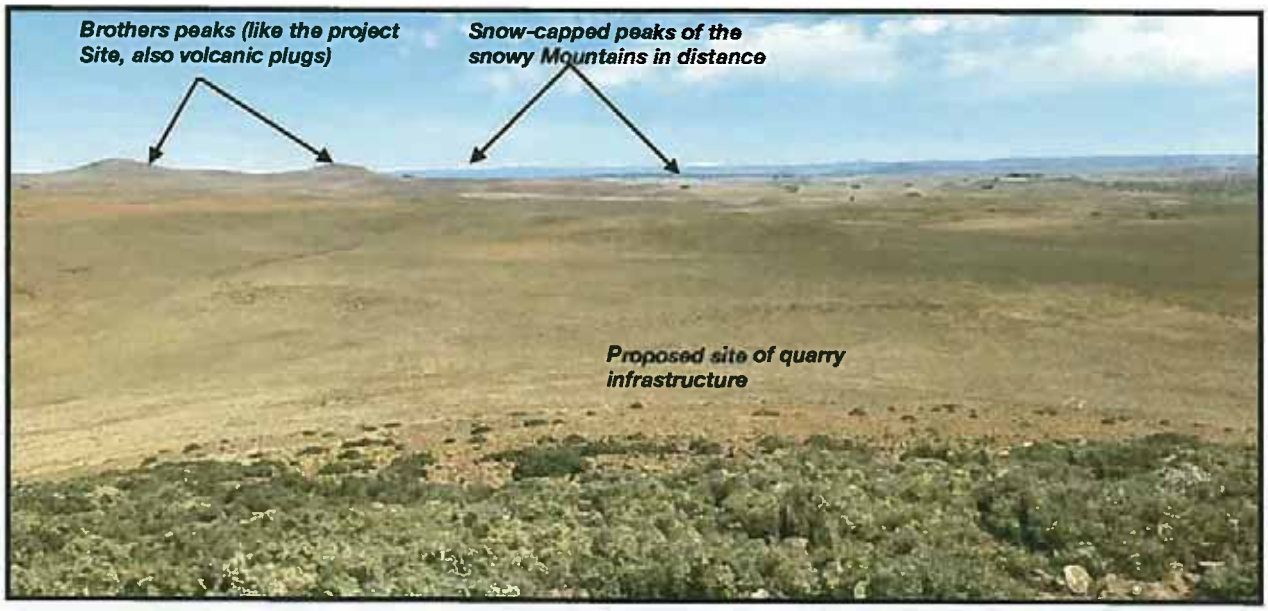


Viewpoint B (refer to Figure 4.12)

Taken from the peak of the knoll on the proposed quarry site, looking to the south west, towards the undulating to rolling grasslands of the Monaro Plain and more distant Brothers landforms- the latter located some 6km or more away from this viewing point.

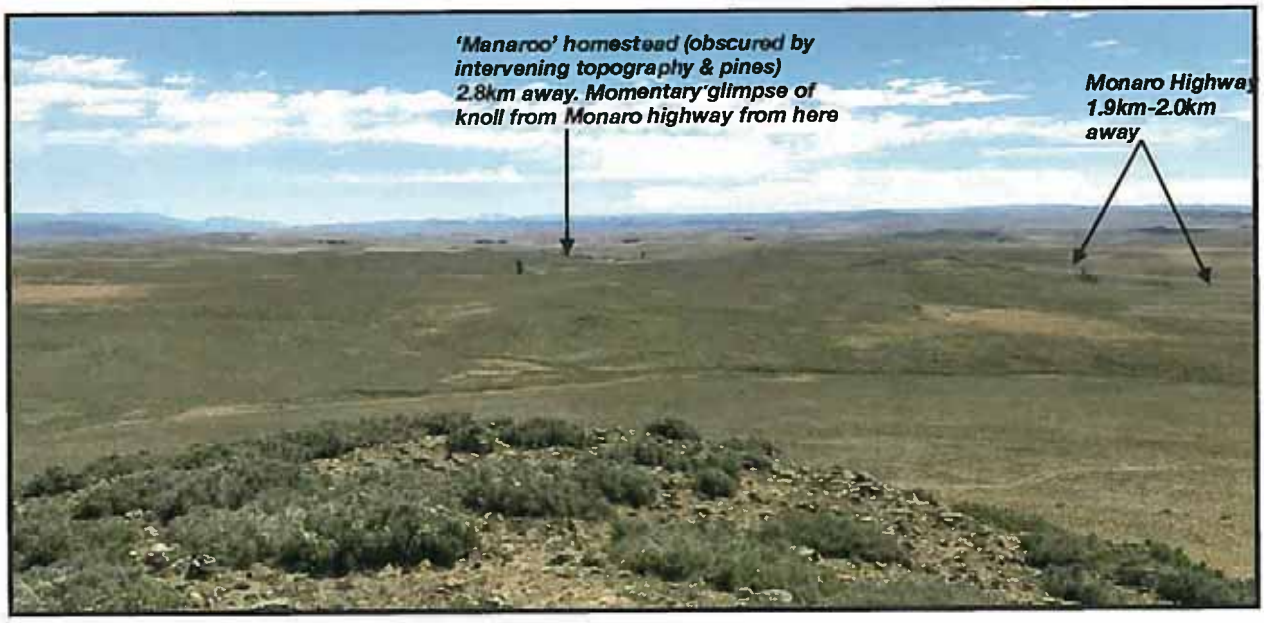
Viewpoint C (refer to Figure 4.12)

Taken from the peak of the knoll on the proposed quarry site, looking to the west, towards the undulating to rolling grasslands of the Monaro Plain and more distant Brothers landforms- the latter located some 6km or more away from this viewing point. No dwellings can be viewed from this viewing point/direction. The proposed site of the quarry infrastructure area, including processing plant and stockpiles, is in the foreground of the photograph.



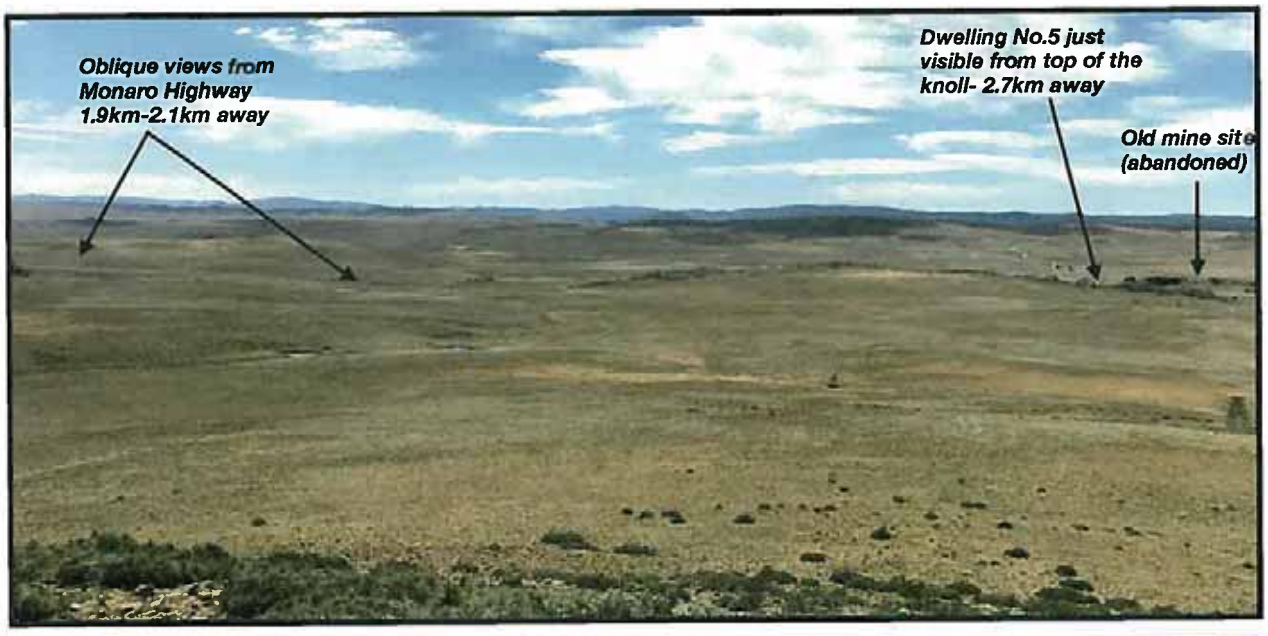
Viewpoint D (refer to Figure 4.12)

Taken from the peak of the knoll on the proposed quarry site, looking to the north and north-east, towards the undulating to rolling grasslands of the Monaro Plain. No dwellings can be viewed from this viewing point/direction- the 'Manaroo' homestead obscured by intervening topography. Views of small sections of Monaro Highway only.



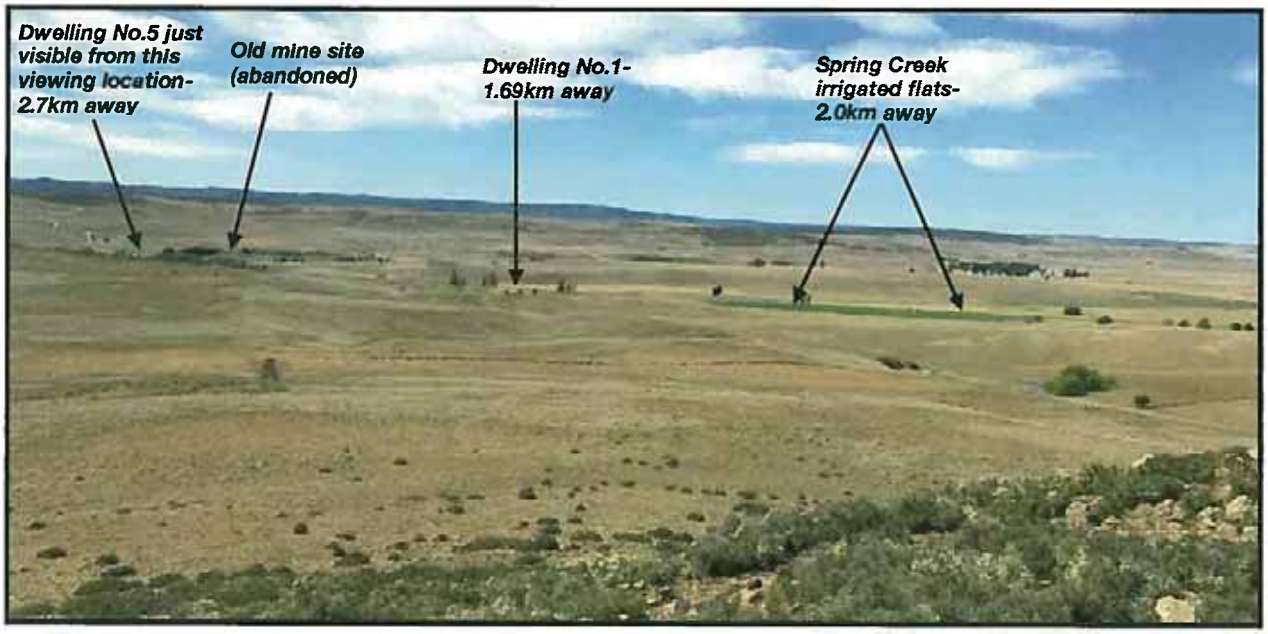
Viewpoint E (refer to Figure 4.12)

Taken from the peak of the knoll on the proposed quarry site, looking to the east, towards the Monaro Highway. Dwelling No. 5, located approximately 2.7km away, is just visible from this high vantage point. No other dwellings can be seen from this point. The former mine site, located near the intersection of springs Road and highway, is on the right hand side of the photograph. The proposed internal quarry haul route, running from the knoll back to the highway, is in the foreground and middle ground of the photograph.



Viewpoint F (refer to Figure 4.12)

Taken from the peak of the knoll on the proposed quarry site, looking to the south east, towards Spring Creek and hills beyond. Dwelling No. 1, the nearest rural dwelling to the proposed quarry, located approximately 1.69km away is in the mid background of the photograph. Dwelling No. 5, located approximately 2.7km away, is just visible from this high vantage point. The former mine site, located near the intersection of springs Road and highway, is on the right hand side of the photograph. The irrigated flats of Spring Creek are also visible from this vantage point.The view takes in the ridge line forming a part of the Monaro Range and edge of viewing area from the Monaro Highway, some 10 km away to the south.



The views from the peak of the knoll that is proposed to be quarried serves as a firm foundation on which to assess visual impacts- refer Section 5 of the EIS.

▪ 4.6 Drainage

The The topography of the site is undulating with an irregular ridge-line present in a general west-east alignment across the site. The ridge-line feature results in the gradient sloping north in the northern portion of the site and sloping south in the southern portion of the site. The highest location of the Project Site is the peak of the knoll/ hillock, which rises to an approximate elevation of 1,035m Australian Height Datum (mAHD). The knoll/hillock is proposed to accommodate a quarry having a circular footprint of approximately 350m diameter.

Ephemeral drainage features are located to the north and south of the proposed quarry area and are tributaries of Rock Flat Creek and Spring Creek, respectively. Farm dams are associated with these drainage features. Refer **Figure 4.1** for overview of topography of the site and surrounds, as well as the location of drainage features. The site is located in an elevated position surrounded by very undulating terrain with nearby drainage lines.The site sits at a natural high point in the topography and as such runoff from the site is at the headwater of the ephemeral drainage lines to the north and south of the site.

The Cooma- Monaro Local Environmental Plan 2013 does not contain Flood Planning Maps. The location of the site at an elevated position at the top of the catchment of ephemeral drainage lines would indicate that the site is not subject to flooding.

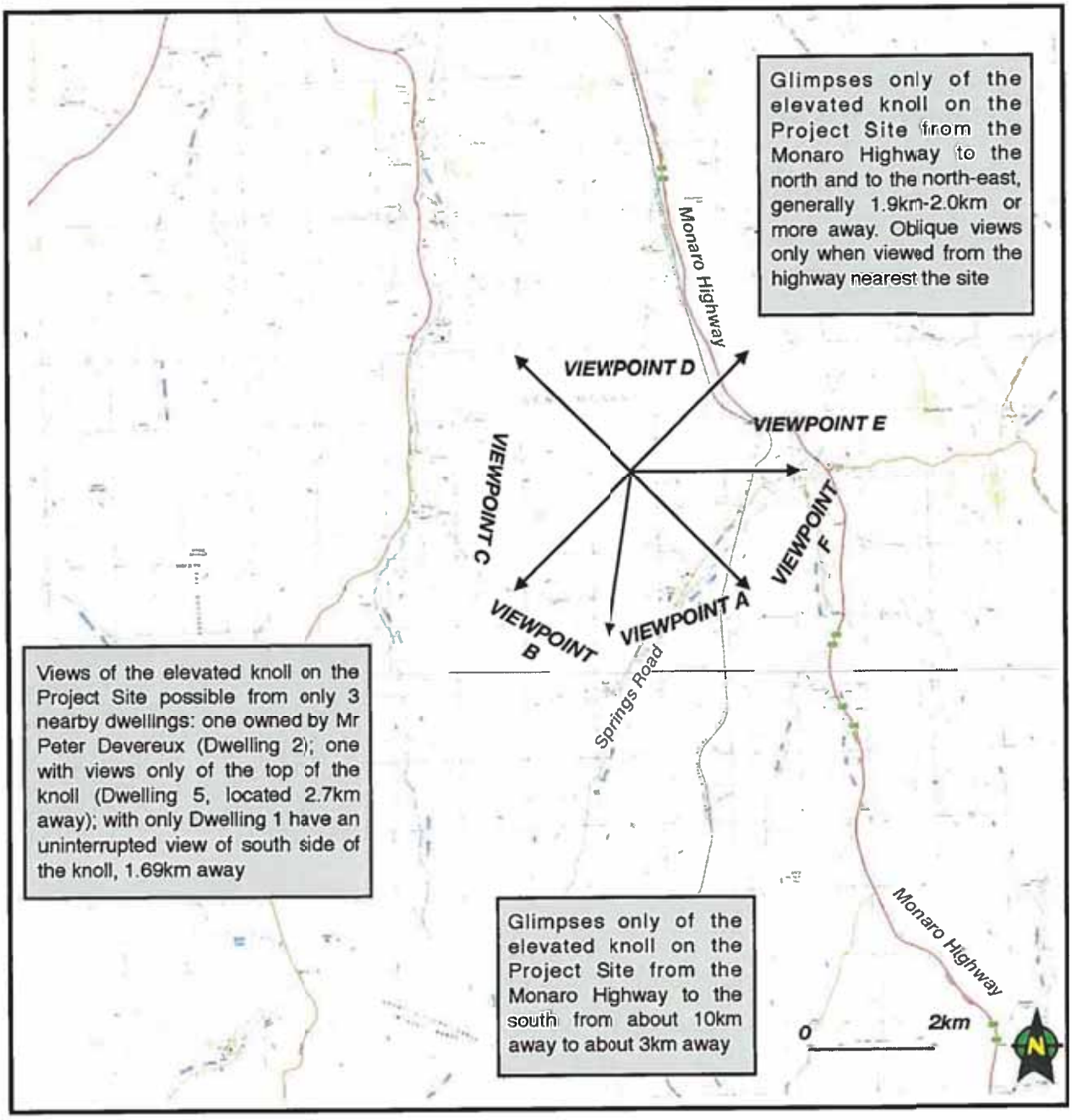


FIGURE 4.12: Landscape context- viewpoint directions from top of knoll on Project Site

(Map Base Source: Six maps website- Jillimatong & Myalla 1;25,000 topographic maps)

A search for registered groundwater users located within a 500 m radius of the site was undertaken using the NSW Office of Water on-line database found that there is one (1) groundwater bore registered for stock and domestic purposes within 500 m of the site, on Springs Creek near the Monaro Highway intersection. A NSW Office of Water monitoring bore is also located on the northern boundary of the site. Refer Figure **4.13**.

Drilling of the quarry site by Schmidt Quarries indicates no groundwater to be present within or surrounding the area of the proposed quarry pit. No evidence of groundwater or high water-table was encountered during an inspection of excavated pits/soil profiles by Outline Planning Consultants Pty Ltd in October 2017. Refer to soil profiles in Section 4.2 of the EIS.

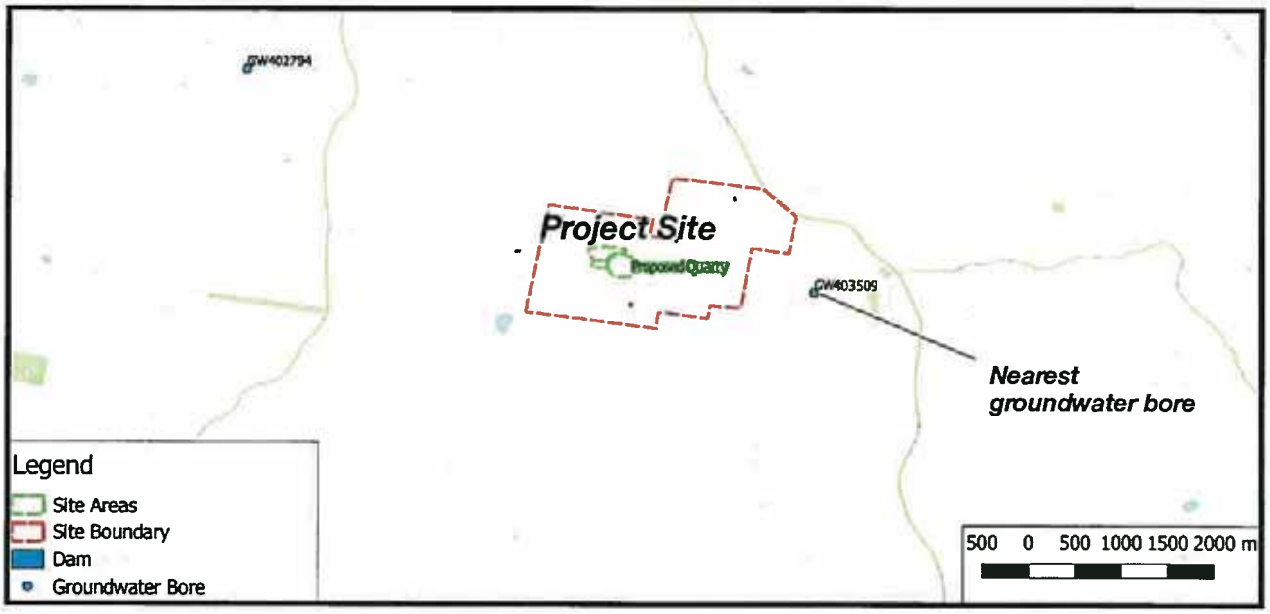


FIGURE 4.13: Groundwater bores in locality

(Source: Geolyse 2017)

4.7 Cultural Heritage

New South Wales Archaeology Pty Ltd was commissioned to undertake an Aboriginal Cultural Heritage Assessment in relation to the proposed quarry development. The study has sought to identify and record Aboriginal cultural areas, objects or places, to assess the archaeological status of the proposal area, and to formulate management recommendations based on the results of community consultation, background research, field survey and impact assessment. Refer also to **Appendix I**. The results of this study are summarised in the following.

4.7.1 Overview

Aboriginal people have occupied Australia for at least 40,000 years and possibly as long as 60,000. By 35,000 years before present (BP), all major environmental zones in Australia, including periglacial environments of Tasmania, were occupied. Aborigines have lived in the Cooma-Monaro district and its environs for at least 21,000 years. In the south-eastern highlands the Birrigai rock-shelter has provided dates of occupation from 21,000±200 years BP. Evidence and cultural meanings relating to past Aboriginal occupation are present throughout the landscape. At the time of European contact, the major part of what is now called the Monaro was inhabited by at least 500 Ngarigo speaking Aborigines. This group exploited the resources of the riverine, grassland and open forests of the region, including those located in the environs of the study area. Their choice of camp-site was influenced by several factors, and from archaeological evidence, Flood indicates that in this region camp-sites will be typically found within one kilometre of reliable water sources, most usually within 100 metres from water, though never at the water's edge.

A model of seasonal usage of the high country of the Monaro Plain by Aboriginal people is generally accepted. The seasonal migration to higher altitudes in summer months is accepted. During winter small groups of Aboriginal people would have occupied the lower montane valleys and the adjacent tablelands. The region would have opened up considerably however, in summer. White settlers began to move into the Monaro region during the early 1800s. European settlement ultimately resulted in the alienation of Aboriginal people from their traditional lands and changes in regard to cultural and economic relationships with country.

In 1823 (white) explorers were informed by Aboriginal people that the area of the rolling downs was the 'Monaroo'. The explorers subsequently named the treeless rolling downs 'Brisbane Downs' after the governor of the time, however, the Aboriginal name proved the more popular, and enduring, name in time.

4.7.2 Search of OEH Records & Field Survey Results

A search of the NSW OEH Aboriginal Heritage Management Information System (AHIMS) has been conducted for this project (AHIMS Reference: 292605). One Aboriginal object site is listed in the search and is some distance outside and to the south of the area investigated. A field survey for Aboriginal areas, objects and places was carried out. In accordance with the OEH Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW, the purpose of a field survey is to record the material traces and evidence of Aboriginal land use that were either visible at or on the ground surface, or exposed in section or visible as features (e.g. rock shelters with rock-art), and to identify those areas where it can be inferred that, although not visible, material traces may have a high likelihood of being present under the ground surface.

The archaeological survey entailed a wide-ranging pedestrian survey undertaken by New South Wales Archaeology Pty Ltd with Mr Eric Naylor, Sites Officer, Merrimans LALC. The survey was aimed at locating Aboriginal objects, areas and places. An assessment was also made of prior land disturbance, survey coverage variables (ground exposure and archaeological visibility) and the potential archaeological sensitivity of the land. The subject area was found to have sustained low/moderate impacts as the result of previous agricultural land use. No Aboriginal objects were recorded during the field survey. Generally, the subject area was found to be of very low to low archaeological sensitivity and potential.

▪ 4.8 Roads & Traffic

4.8.1 Existing Road Network

The proposed development is to be on land comprising Lot 62,76,78, 106 & 120 in Deposited Plan 750540, No. 278 Springs Road, Rock Flat, located approximately 14km to the south of Cooma, on the Monaro Plain in the NSW Southern Tablelands. The Project Site located on the western side of the Monaro Highway, which links the ACT and Cooma to the east coast, via Nimmitabel and Bega. The highway is designated B23, and in the vicinity of the proposed development site, is approximately 9m wide, with 3.5m wide lanes in either direction, and a 1m sealed shoulder on both sides. Across the frontage of the subject site, the sealed shoulder has been widened to 2m on the eastbound side, to allow vehicles to pass any vehicles slowing or waiting to turn right into the property access. The posted speed zone of the Monaro Highway, in the vicinity of the proposed development, is 100km/hour. In the vicinity of the proposed quarry, there are a few minor side roads on either side of the highway. These are generally unsealed and provide access to rural properties. To the east of the Project Site is a gravelled rural road known as Springs Road.

4.8.2 Existing Traffic Volumes

The latest traffic data (RMS 2016) indicates that the Monaro Highway accommodates average annual daily traffic volumes of 2,255 vehicles 9eastbound and westbound). RMS historical traffic data shows the growth of average daily traffic volumes between 2007 and 2016 to be a modest 1.5% per annum, with highest traffic flows between 11.00am and 3.00pm. The turn movements into and out of Spring Road and Tom Groggin Road (to the south-east of the proposed quarry) were included to indicate the low volumes on the adjacent local roads, which were generally related to school pick-up or drop-offs.

Heavy vehicles numbers- which would include existing quarry traffic from/to Nimmitabel Quarry- were approximately 11% of the total highway volume in both the morning and afternoon counts. Refer also to **Appendix J**.

4.9 Flora & Fauna

Gunninah was engaged by Outline Planning Consultants Pty Ltd to undertake a flora and fauna assessment of the Project Site and surrounds, conducted in accordance with section 5A of the *Environmental Planning & Assessment Act (1979)*, and *Threatened Species Assessment guidelines* (DECC, 2007). Refer also to **Appendix L**. Dedicated field investigations of the subject land were undertaken by Lesryk Consulting (in November and December 2017, followed by an inspection by Dominic Fanning of Gunninah on 6 December 2017. Five different ecologists attended the subject land on a total of 15 person-days in November and December 2017.

4.9.1 Vegetation Communities

The assessment finds that the Project Site supports four main vegetation types; all of which one have been albeit significantly modified as a result of many decades of grazing and other agricultural pursuits. Refer **Figure 4.14**.

- Melicytus shrub land – which occupies the summit of the volcanic plug on which the proposed quarry is located.
- Native tussock grassland – which occupies most of the subject land
- Modified grassland (pasture-improved) – which is of limited extent but which has been used to locate the proposed quarry haul road.
- Low woodland – which is confined to the ridges in the eastern part of the Project Site.

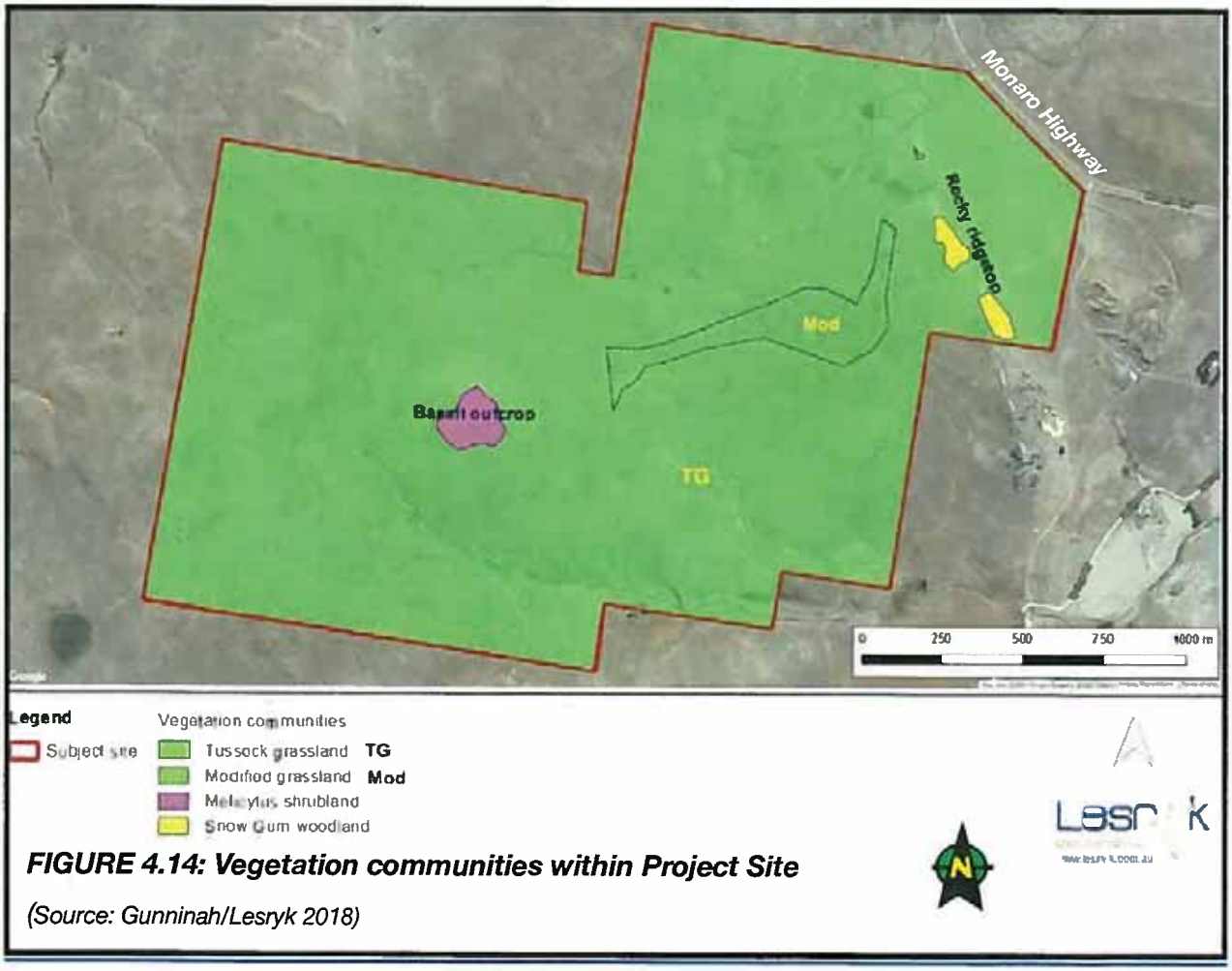


FIGURE 4.14: Vegetation communities within Project Site

(Source: Gunninah/Lesryk 2018)

The Project Site is surrounded by existing extensive grazing and agricultural lands – which have long been grazed and in places (including on the subject land) 'pasture-improved' and/or used for more intensive agricultural pursuits. The land itself appears only to have been used, in relatively recent times at least, for the broad-scale grazing of sheep.

As a result *inter alia* of the long-term grazing of the land over many decades, and previous pasture-improvement activities, the vegetation on the Project Site has been modified, and contains varying levels of introduced and pasture grasses and weeds.

The majority of the Project Site is a treeless tussock grassland (as are most of the surrounding properties), and the only trees present on the subject land are located along the small ridge line near the Monaro Highway.

The treeless grassland feature of the landscape is the natural condition of the Monaro Plain .

Native Tussock Grassland

Native grassland dominated by tussock grasses with other native grasses and forbs (ie. a herbaceous flowering plant other than a grass) characterises most of the project site. There are no trees or shrubs within the Native Tussock Grassland on the project site- a characteristic of the Monaro Plains; not a derived feature of the landscape.

The Native Tussock Grassland on the subject land is dominated by tussock grasses (predominantly *Poa labillardieri* but also *Poa sieberiana* in depressions and along the watercourses), along with other native groundcover species (*eg* Common Woodruff *Asperula conferta*, *Lepidium sp.*, Kidney Weed *Dichondra repens*, Blue Storksbill *Erodium crinitum* and Jersey Cudweed *Pseudognaphalium luteoalbum*). Common introduced species include Soft Brome *Bromus hordeaceus*, Wheatgrass *Anthosachne scabra*, Medic *Medicago spp.*, Clover *Trifolium spp.* and Common Storksbill *Erodium cicutarium*.

Parts of the Native Tussock Grassland are covered with scattered surface rock lying on the surface or slightly embedded into it. This provides shelter for native reptiles - in particular the threatened Striped Legless Lizard and Grassland Earless Dragon, which were recorded at several locations on the subject land. The records of the Grassland Earless Dragon in the central part of the subject land (along the original proposed haul road route) resulted in the alignment being altered into the Modified Grassland area.

Modified Grassland

The Modified Grassland on the subject land at Rock Flat appears to have been 'raked' (only small stones remain) and pasture-improved. The Modified Grassland is characterised by introduced pasture species (such as Soft Brome *Bromus hordeaceus*, Wheatgrass *Anthosachne scabra*, Medic *Medicago spp.*, Clover *Trifolium spp.* and Common Storksbill *Erodium cicutarium*), and has been deliberately selected for the majority of the access/haul road through the property

Melicytus Grassland

The Melicytus Shrub land vegetation is located on the upper parts of the basalt outcrop (the hill which is to be quarried). The only shrub present is the Tree Violet *Melicytus* sp. aff. *dentatus* (Snowfields variant), which becomes increasingly dense towards the top of the basalt outcrop. Surface rock is abundant through this area, and there are scattered native and introduced grasses also present. This grassland provide less suitable habitat for the grassland reptiles discussed below.

Low Open Woodland

The Low Open Woodland is confined to the small rocky ridge line in the eastern part of the subject land – just west of the Monaro Highway.

This vegetation type consists of a sparse canopy of Snow Gum *Eucalyptus pauciflora*, that reaches 8-10m in height. A number of the trees present contain small hollows (diameter ~150mm). There is a sparse shrub layer of *Cassinia aculeata* subsp. *aculeata*, as well as scattered individuals of *Daviesia leptophylla*, Violet Daisy-bush *Olearia iodochroa* and Tree Violet *Melicytus sp.* aff. *dentatus* (Snowfields variant). The groundcover consists of Snowgrass *Poa sieberiana* var. *sieberiana*, *Austrostipa sp.*, Australian Stonecrop *Crassula sieberiana*, and other grasses, herbs and forbs. In addition, loose surface rock and rock outcrops are common, along with fallen branches and hollow logs.

It is to be noted that the Low Open Woodland will not be affected by the proposed quarry development, as the access/haul road is located in a small 'pass' through the ridge line and the quarry operations are not located close to the ridge line.

Refer also to **Figure 4.14**.

Flora Assemblages

The assessment finds a flora assemblage of 54 plant species, of which a significant number (23 or 43%) are introduced species; including a number of pasture grasses and herbs. As indicated in the vegetation map above, the majority of the subject land supports a tussock grassland – predominantly of native species. None of the introduced species is listed in Schedule 3 of the NSW *Biosecurity Regulation 2017*; or as a 'priority weed' in the South East Region (DPI 2017); or as a Weed of National Significance (Commonwealth government).

Threatened Vegetation Communities

No threatened plant species have been recorded on the subject land despite searches during suitable weather conditions and at an appropriate time. Refer to accompanying ecological assessment for details. [NOTE: A "*threatened ecological community*" is specified in Schedule 1 of the *Threatened Species Conservation Act 1995.* A "Threatened Species" is a species specified in Part 1 or 4 of Schedule 1 or in Schedule 2 of the *Threatened Species Conservation Act 1995.*]

There are no "*endangered populations*" of native plants listed in the *Threatened Species Conservation Act 1995* that are of any potential relevance to the proposed activities on the Project Site. [NOTE: an *"Endangered Population"* is a population specified in Part 2 of Schedule 1 of the *Threatened Species Conservation Act 1995.*]

The OEH identifies two Threatened Ecological Communities (TECs) as "likely to occur in the vicinity", comprising, inter alia: White Box Yellow Box Blakely's Red Gum Grassy Woodland; and Tablelands Snow Gum Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions.

In this regard the assessment finds:

- None of the relevant tree species are present; and there is no indication that the White Box Yellow Box Blakely's Red Gum Grassy Woodland ever existed at this location.

- The Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland EEC may be represented by the open woodland along the small ridge line in the eastern part of the subject land; despite the *Final Determination* for this EEC stating that it "*mainly occurs on valley floors, margins of frost hollows, footslopes and undulating hills*". On that basis, this woodland vegetation does not appear to meet the locational criterion7 for the Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland EEC. Relevantly, in any case, the woodland vegetation along the ridge line will not be affected in any way by the proposed quarrying operations on the Project Site; including for the access/haul road to the quarry. Whether or not the EEC is present is therefore of no consequence.

4.9.2 Fauna

Overview: Fauna

The Project Site- and in particular the site of the proposed quarry- contains only a modest array of habitat features and resources for native fauna.

- Several areas were identified as supporting populations of the Grassland Earless Dragon, and a Striped Legless Lizard was also located in an area of tussock grassland with rocks; although none are now in areas to be disturbed for the proposed quarry and its ancillary activities. It is noted that the route of the access road has been altered to avoid an area in which specimens of the Grassland Earless Dragon were located.

- The basalt hill (ie. the knoll) has somewhat different characteristics, with low shrubs becoming more prevalent towards the summit, and the rocks being more embedded than on the lower slopes (providing less suitable habitat for the reptiles). Searches on the hill in both November and December failed to locate any of the reptiles, despite significant success on the lower slopes at the same times.

- The small rocky ridge lines in the eastern part of the Project Site, close to the Monaro Highway, support a greater array of habitats and resources for native fauna, including small trees, larger rocks and small cliffs, logs (some hollow) and fallen branches, and greater variety of flowering shrubs. There are no caves, however, and thus no breeding sites or significant roosting sites for hollow-dependent species. The two hollow-dependent microchiropteran bats recorded (the Eastern Bent-wing Bat and Southern Myotis) are likely to be roosting in artificial structures through the landscape. The ridge lines and their associated habitats and resources are not to be affected by the proposed quarrying operations.

- The watercourses which traverse the subject land provide only limited habitat.

- The native mammal and avian fauna assemblage on the Project Site is limited. This is primarily a consequence of the nature of the land and the habitats that it supports. Bird and mammal species recorded and/or likely to occur on the Project Site and quarry site are confined primarily to species of open grasslands or which are capable of utilising open and exposed environments (given the lack of trees, rock outcrops or water within the subject site). The variety of reptiles recorded is also unsurprising – given the nature of the local environment. Open grasslands with rocks often support substantial reptile assemblages, and the array of reptile species on the subject land was as anticipated. Amphibians were also present in notable numbers – albeit located in discrete sites through the Project Site. Significant numbers of Eastern Banjo Frog, Spotted Grass Frog and Common Eastern Froglet were heard calling from the small 'bog' in the northwestern part of the Project Site, and Peron's Tree Frog was recorded along the small stony ridge line in the eastern part of the land.

Threatened Fauna

Of the 36 native fauna species recorded on the Project Site, two mammal species (the Large-footed Myotis *Myotis macropus* and the Eastern Bent-wing Bat *Miniopterus orianae oceansensis*) and two reptile species (the Striped Legless Lizard *Delma impar* and Grassland Earless Dragon *Tympanocryptis pinguicolla*) are listed in the *Threatened Species Conservation Act 1995* as '*threatened species*'. Of these, the latter is listed as "*endangered*" whilst the other 3 are listed as "*vulnerable*". Refer **Figure 4.15**.

The Grassland Earless Dragons was recorded at three locations on the Project Site and the Striped Legless lizard at one site. The Striped Legless lizard was located on the southern flank of the hill proposed for extraction, south of the proposed extent of the quarry. Measures to protect this species and its habitat, and to supplement habitat resources for the Striped Legless Lizard, have been incorporated into the project- refer Section 2.3.13 of the EIS for details.

Grassland Earless Dragon, Striped Legless Lizard

The Grassland Earless Dragon was recorded at two locations along the original access/haul road alignment and near the entrance to the land at the Monaro Highway (see plan above). The alignment of the internal quarry access/haul road has subsequently been altered to remove it from the habitat for this species. Specifically, the Dragons were located in an area characterised by tussock grasses and substantial surface rock, on gentle slopes above an ephemeral drainage line. The access/haul road has been relocated into an area of improved pasture with few rocks that does not constitute suitable habitat for this species. As for the Striped Legless Lizard, measures to protect this species and its habitat, and to supplement habitat resources for the Grassland Earless Dragon have been incorporated into the project- refer Section 2.3.13 of the EIS for details.

Pink-tailed Legless Lizard

The Pink-tailed Legless Lizard *Aprasia parapulchella* also inhabits native grasslands and open grassy woodlands with surface rocks, beneath which it shelters in ant nests and burrows.

The Pink-tailed Legless Lizard appears to prefer grasslands dominated by *Themeda* and similar grasses, rather than the tussock grassland dominated by *Poa* species as is typical of the Project Site and surrounding environs. No specimens of the Pink-tailed Legless Lizard were recorded during the extensive field investigations of the land, despite the collection of specimens of both the Grassland Earless Dragon and Striped Legless lizard.

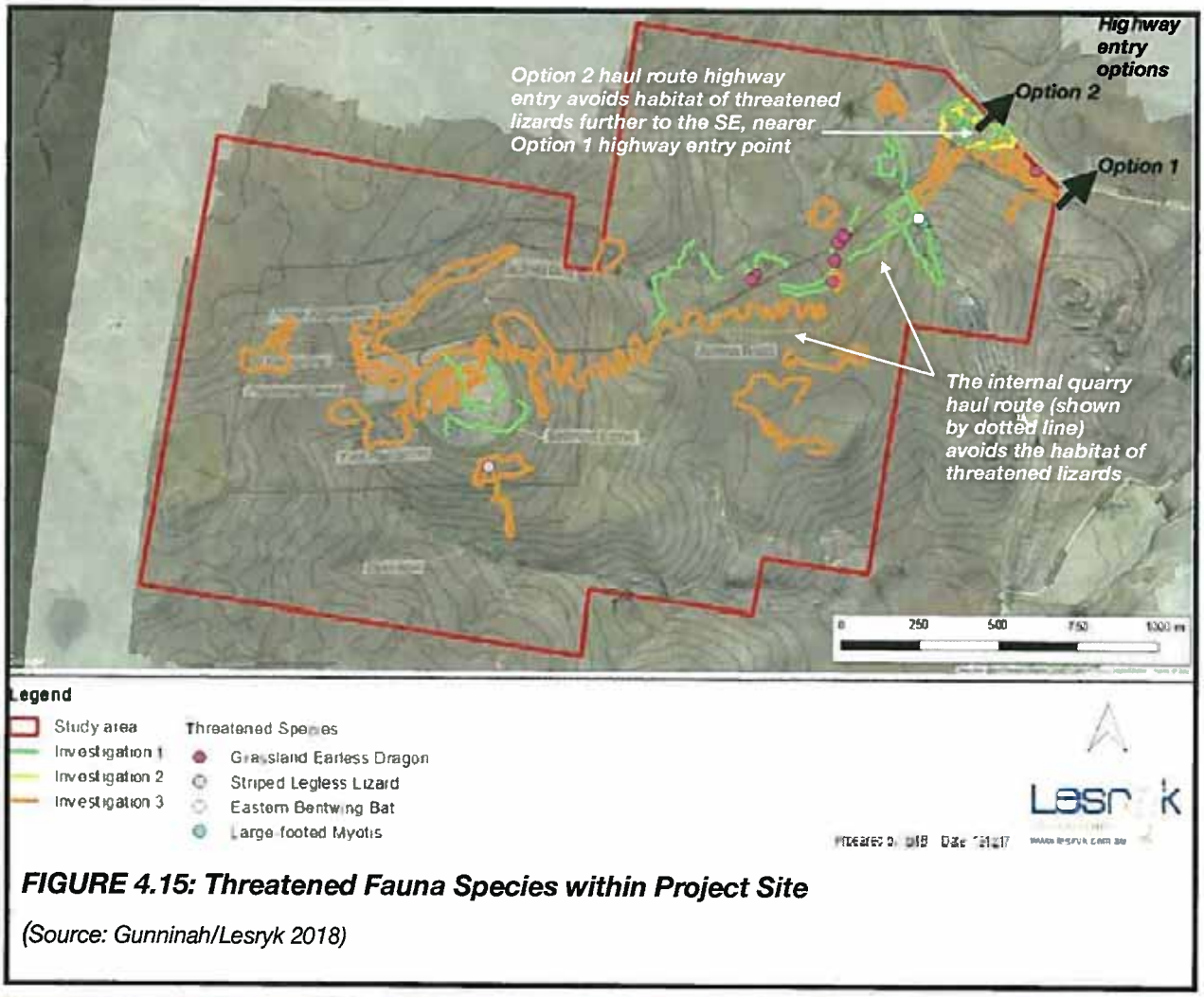


FIGURE 4.15: Threatened Fauna Species within Project Site

(Source: Gunninah/Lesryk 2018)

Other Threatened Species

Because of the nature of the subject land and the Project Site (being predominantly a treeless grassland and a small area of low shrub land), most of the additional threatened species listed by the OEH in the SEARS documentation would not be likely to occur. The small area of open woodland on the Project Site provides only minimal potential habitat for any woodland species; and is not to be disturbed in any case. There are no notable water bodies present on the land.

The assessment finds that there is no suitable potential habitat on the Project Site for species such as the Gang Gang Cockatoo, Varied Sittella, Hooded Robin (southeastern form), Scarlet Robin, Flame Robin, Brown Tree-creeper, White-fronted Chat, Diamond Firetail, Blue-billed Duck, Spotted-tailed (Tiger) Quoll, Koala, Golden Sun Moth, Rosenberg's Goanna, Little Whip Snake, Green & Golden Bell Frog, Southern Bell Frog or Alpine Tree Frog.

Whilst highly mobile and wide-ranging threatened raptors (such as the Spotted Harrier, Little Eagle, Black Falcon, Square-tailed Kite) could potentially occur (on occasions at least), the assessment finds that the Project Site does not possess any particular resources or habitat features upon which even individuals of any such species could be reliant. The Project Site, and particularly the proposed quarry site, represent only a minuscule proportion of any potential habitat for any such species in the locality.

▪ 4.10 Bushfire

The site of the quarry is cleared, generally tree-less agricultural land. It is not declared as bushfire prone land.

5.Environmental Assessment

5.1 Overview

The following section assesses the likely environmental and planning impacts arising from the proposed quarry on the Project Site. The identification and prioritisation of environmental issues associated with the proposed quarry has enabled the impact assessment contained in the EIS to focus on key impacts and environmental mitigation strategies. Details of all quarry mitigation measures are contained in section 2 of the EIS report and are to be be read in conjunction with the following assessment.

Impacts can be predicted with a reasonable degree of certainty, given that Schmidt Quarries has been carrying out quarrying for decades (since 1994) from a similar-sized volcanic plug only a short distance away, at nearby Nimmitabel. At that quarry Schmidt Quarries has been applying proven, reliable quarry management practices and mitigation measures- and a workforce with skills and experience in working this kind of geological resource- that can be readily applied to this new quarry site. In addition, the comparative remoteness of the site from settled areas in the Rock Flat locality, the cleared nature of the land proposed for quarrying, and the design of the quarry pit on site, will also assist in ensuring that overall impacts on the environment are minimised.The Project complies with the objects of the Environmental Planning and Assessment Act 1979 (EP&A Act), which governs planning and the assessment of development projects in New South Wales, including quarries ('extractive industries' as defined). The quarry project the subject of this EIS is considered to be consistent with the objects of the amended planning legislation, passed by Parliament in November 2017 but yet to be assented to. Refer Section 3.1 for details. The Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act) establishes the system of planning, environmental impact assessment and development approvals in NSW. Refer also to Section 3 of the EIS. Section 79C(1) of the Environmental Planning and Assessment Act (EP&A Act) requires that a range of matters be taken into consideration in the assessment of a development application, comprising:

"(a) the provisions of:

(i) any environmental planning instrument, and

(ii) any draft environmental planning instrument that is or has been placed on public exhibition and details of which have been notified to the consent authority (unless the Director-General has notified the consent authority that the making of the draft instrument has been deferred indefinitely or has not been approved), and

(iii) any development control plan, and

(iiia) any planning agreement that has been entered into under section 93F, or any draft planning agreement that a developer has offered to enter into under section 93F, and

(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph), that apply to the land to which the development application relates,

(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,

(c) the suitability of the site for the development,

(d) any submissions made in accordance with this Act or the regulations,

(e) the public interest."

The Project is considered to be consistent with the relevant objects contained in section 1.3 of the *Environmental Planning and Assessment Amendment Bill 2017*, passed by NSW Parliament on 15 November 2017, yet to come into force- refer Section 3.1.1 of the EIS for details.

5.2 Section 79C(1)(a): Planning Instruments etc.

The proposal complies with relevant planning controls and guidelines, including:

- The proposal accords with the relevant provisions of the Cooma-Monaro Local Environmental Plan 2013 which seek to minimise adverse impacts and hazards, including impacts on terrestrial biodiversity, agriculture or rural amenity. Refer to Section 3.2 of the EIS for details.

- Compliant with relevant State planning policies and guidelines- refer Section 3.3 of the EIS. In particular, the proposed development complies with the provisions of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* which applies to quarry projects like this one. It is also relevant to note that the provisions of *State Environmental Planning Policy (Infrastructure) 2007* make it possible fro a determining authority to grant consent to a quarry development involving a rail crossing, despite the provisions of any LEP provision that may not allow it. In this regard Clause 8(1) of that SEPP confirms that the provisions of the SEPP overrides the effect of certain provisions of local environmental plans.

- Does not strictly trigger Commonwealth legislation- refer Section 3.6 of the EIS.

- Complies with the relevant local council DCP- refer Sections 3.4 and 5.2 of the EIS.

Table 5.1: Summary compliance of the Project with Cooma-Monaro LEP 2013

LEP Provision	Compliance
Aims of LEP	Complies. The Project satisfies the principles of environmental sustainability and promotes the orderly and economic use of the land. No significant adverse visual, drainage, noise, amenity, ecological or heritage impacts arise from the proposed development
Objectives of the RU1 zone	The development is satisfactorily buffered from other uses. The quarry is well set back from scenic protection corridor running parallel with the highway. Acceptable environmental impacts, including traffic, groundwater and drainage impacts
Permissibility of the proposed quarry in the RU1 zone	The proposed quarry is permissible in the RU1 zone. The rail crossing is permissible pursuant to the provisions of SEPP (Infrastructure) 2007
Heritage	No part of the project Site is listed as a heritage item. Moreover, the archaeological investigations revealed no archaeological sites or potential
Flooding	Not mapped as being flood prone land
Scenic protection	The quarry site itself lies outside and removed from the Scenic Protection area that lies within 400m of the Monaro Highway. The haul route lies partially within this corridor however, the (low) expected visual impacts are considered acceptable
Terrestrial biodiversity	The quarry site itself is free of any biodiversity values. The internal haul route has been re-designed in order to avoid the habitat of a threatened lizard species
Groundwater	Drilling reveals no presence of groundwater. The nearest evidence of groundwater outcropping on the Project Site is at a location at lower elevation in a watercourse approximately 100m to the SW of the proposed quarry
Landslide risk	The Project Site is free of any land instability or landslide risk.
Other risks	The quarry site and haul route does not form a part of any drinking water catchment, riparian lands, karst lands, or wetlands

The proposed quarry is a permissible development under the provisions of the Cooma-Monaro Local Environmental Plan 2013- the use being permitted in the RU1 zone. "Extractive industries", as defined are specifically included in the land use table under the heading "Permitted with consent". In fact this use is only one of 14 land uses specifically identified in this zone as being a permitted use.

In the judgement of Robson J in *Omid Mohebati-Arani v Ku-ring-gai Council [2017]* NSWLEC 143 at para [76] the learned judge had this to say about the importance of the zoning of the land for a particular use, stating, inter alia:

> *"76 First, where land by its zoning has been identified as generally suitable for a particular purpose, weight must be given to that zoning in the resolution of a dispute as to whether development is appropriate. As has been frequently stated by this Court, whilst the fact that a particular use may be permissible is generally a neutral factor, a planning decision must generally reflect an assumption that development which is consistent with the zoning will be permitted. This is because the Act provides a complex regime, including extensive public participation, to determine the nature and intensity of development which may be appropriate at any site, and accordingly weight should be given to the outcome of this process (see BGP Properties Pty Limited v Lake Macquarie City Council [2004] NSWLEC 399; (2004) 138 LGERA 237 at [117]-[118] per McClellan CJ of LEC)."*

The accompanying table summarises the compliance of the proposed development with applicable SEPPs.

Table 5.2: Summary compliance of the Project with relevant SEPPs

State Environmental Planning Policy	Applicability to proposed quarry development
SEPP (Exempt and Complying Development Codes) 2008	Not applicable. However, there is the ability to utilise this SEPP in the future
SEPP (Rural Lands) 2008	No inconsistencies with rural planning principles. No conflict with agriculture- refer to section 5.2 for further details. The Project does not involve a rural subdivision or a rural dwelling
SEPP (Infrastructure) 2007	Complies. The proposed development will connect with a classified road. Consultation required with RMS pursuant to the provisions of clause 101 of the SEPP. Rail crossing permitted by this SEPP despite the provisions of the LEP
SEPP (Mining, Petroleum Production and Extractive Industries) 2007	Complies. The proposed development is a permissible use and is considered to be compatible with existing, approved or likely adjoining land uses in the neighbouring locality at Rock Flat. Impacts considered to be both manageable and satisfactory. Satisfactory rehabilitation measures are proposed. The Project will enable the optimisation of a valuable, quality volcanic hard rock resource (volcanic plug) on the site
SEPP No.55 - Remediation of Land	The contamination assessment contained in this EIS finds that the land is unlikely to contaminated land for the purposes of this SEPP - refer **Appendix K**
SEPP No. 44-Koala Habitat Protection	Not applicable. The Project Site is devoid of trees and potential koala habitat. Refer also to **Appendix L**
SEPP No. 33- Hazardous & Offensive Development	Not considered to be either hazardous or offensive development

[NOTE: The proposal seeks to have many of the various quarry management and mitigation measures incorporated into a quarry plan of management. In *Amazonia Hotels Pty Ltd v Council of the City of Sydney* [2014] NSWLEC 1247, Pearson C set out at (72) that the Commissioners had decided that where a Plan of Management is appropriate, it should be incorporated in the conditions of consent.]

5.3 Section 79C(1)(b): Likely Impacts

The likely impacts of the project on the natural and built environments are considered in the following. These impacts are considered in the context of the following known site features:

- The proposed quarry and haul route are in a sparsely populated rural area with the nearest rural residence 1.69km away, and with only a further one (1) rural residence not associated with the quarry within 2km of the proposed quarry.
- The land has a low or zero agricultural value, having regard for the extensive areas of exposed rock within the proposed quarry footprint.
- The Project Site is not bushfire prone land.
- There is no item of the environmental heritage on the land.
- The Project Site comprises a treeless grassland.
- The land is not subject to landslip hazard or subsidence or acid sulphate soils.
- The quarry is flood free and is set back from any any watercourses.
- The quarry haul route has been re-designed in order to avoid the habitat of a threatened lizard species.
- In the initial phase, quarrying will be undertaken behind a knoll, out of sight of neighbouring residences and from viewers travelling on the highway from the east. Perimeter tree plantings proposed, once established, will screen views of the quarry from a neighbouring rural residence and from the highway in the latter phases of quarrying the site.

5.3.1 Traffic and Transport Impacts

In terms of traffic likely to be generated by the proposed new quarry it is important to note that the Project is required to enable Schmidt Quarries to shift their operations from the Nimmitabel quarry to the Project Site-the Nimmitabel quarry operations planned to cease operation within the next few years. The Nimmitabel quarry has approval to produce up to 280,000 tonnes of quarry product per annum- the same as that proposed at the Project Site. Once the Project is operational, Schmidt Quarries will be generating the same or similar levels of quarry truck traffic on the road system as is currently the case, with no increase in quarry truck traffic levels. Traffic consultants Streetwise undertook a traffic impact assessment to assess the traffic impacts associated with the proposal, the results summarised in the following. Refer also to **Appendix J**.

Traffic Generated by Proposed Quarry Development

Schmidt Quarries proposes to establish a hard rock quarry, to extract and process a maximum of 4.6 million tonnes over a 30-year period, at a rate of 280,000 tonnes per year. Given that t Schmidt Quarries currently operates existing quarries, with a fleet of truck & dog trailers, which haul an average of 39 tonnes per trip, the following can be concluded about the proposed quarry at Rock Flat:

- Proposed maximum annual tonnage produced: 280,000 tonnes (average of 150,000 tonnes per annum).
- Capacity of standard truck 39 tonnes.
- Annual total of trips 7,180 laden or 14,360 haul and return.
- Average per week (50 weeks) 144 laden quarry trucks or 288 return trips per week.
- Average per day (5.5 days) 26 laden quarry trucks or 52 return trips per day.
- Average number of quarry trucks per hour (10-hour day): 2.6 laden quarry trucks per hour or 5.2 return trips.

The above estimates are based on an average number of weekly, daily and hourly trips to deliver 230,000 tonnes of processed hard rock per year- the maximum quarry production level. However, the demand for quarry product is not usually constant, with demand from end-users varying significantly from periods of peak as against periods of quiet activity, hence the assumed average production of 150,000 tonnes per annum.

Schmidt Quarries advise that a proposed peak day maximum 2,500 tonnes should be assumed. This would require an estimated 64 laden trips per day to deliver the quarry product, or a maximum 128 return trips (per day [NOTE: not all gravel deliveries will include a return trip]. This averages out to approximately 13 return trips per hour (for a 10-hour working day) on a peak day. However, it is likely the number of hourly trips will be greater in the morning than afternoon, with 8 laden trips (or a total of 16 trips) per hour adopted as the maximum number of daily movements for the purposes of this assessment.

In addition to the haulage movements generated by the quarry, the site employs truck drivers, plant operators and administrative staff, who will commute to the site from Cooma and other locations. As with the existing quarry operations at other locations, it is expected that staff will arrive at the site from around 6.00 am at a rate of about 5 vehicles per hour through to 9.000am. Similarly, staff will leave work from mid-afternoon at a similar rate.

Trip Assignment

For the purposes of this assessment, the following assumptions have been adopted, based on potential customers and movements from existing quarries in the Cooma area and based on known demand for product for Schmidt Quarries products from the Nimmitabel quarry, the latter having operated for decades:

- The majority of laden truck movements (65%) out of the site are likely to be south, towards Nimmitabel, via the Monaro Highway. The rest of the movements (35%) will head north on the Monaro Highway towards Cooma and locations further afield.
- While the average number of estimated trips is 4 trips per hour, and the hourly average to deliver 2,500 tonnes per day is 13, a maximum of 16 heavy vehicle trips per hour (ie. 8 laden quarry trucks) has been adopted for the morning peak times, and 6 (ie. 3 laden quarry trucks) per hour for afternoon periods.
- Staff movements will be approximately 5 per hour in both the morning and afternoon. All trips to and from the site will be via the Monaro Highway, with a split of 60% from Cooma and 40% from the south adopted for the purposes of the traffic assessment.

Refer accompanying **Figure 5.1**.

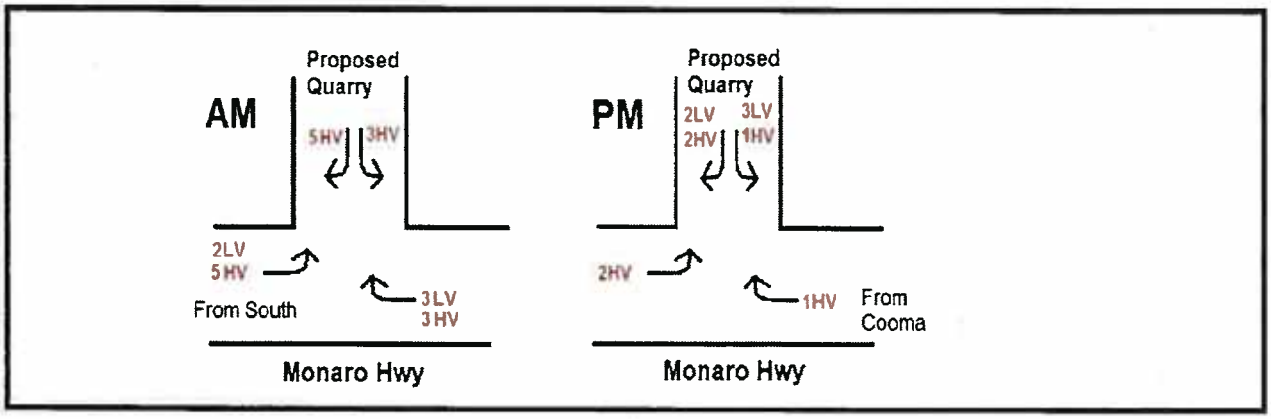


FIGURE 5.1: Estimated peak hour vehicle trips to be generated by proposed quarry

(Source: Streetwise traffic report Figure 3.7)

Development Impacts on Monaro Highway and Local Road Network

The proposed quarry will generate approximately 160 trips per day at a peak production day, with up to 21 trips per hour in and out of the site access during a morning peak (7:00am – 8:00am). During morning and afternoon peak times, approximately 50% of the movements will be staff commuting via light vehicles.

Existing traffic volumes on the Monaro Highway are relatively low (ie. a total of 2,255 vehicles per day (vpd) in 2016), with a peak hourly volume of 200 vehicles (total of both directions).

It should be noted that existing traffic patterns on the Monaro Highway actually result in a peak volume around mid-day. However, peak quarry truck movements are expected to occur outside of this peak period, around 7.00am, when existing vehicle hourly volumes on the Monaro Highway will total approximately 100 vehicles. Similarly, when the Monaro Highway experiences peak volumes (between 11.00am and 3.00pm), the quarry will be generating only 2 laden quarry truck trips (or total of 4 movements) per hour.

The Monaro Highway is a B-class state road, and currently has the standard and capacity to cater for both the minor increase in volumes and the weight and size of the haulage vehicles to be generated.

The most significant traffic impacts will result from the conflict between the slow speed, slow acceleration heavy vehicles from the quarry, and the high speed vehicles on the Monaro Highway. However, given the current low volumes on the highway (max 200 vph), the average gaps in the traffic (30+ seconds), and good sight distance either side of the proposed access (option) location(s), the impacts of quarry truck traffic on the highway traffic movements are likely to be minimal.

It should be also noted that the applicant operates other quarries in the Cooma region, with one of those quarries to be closed- at Nimmitabel- in the near future. It is planned that the proposed quarry will replace the existing quarry at Nimmitabel, and supply a similar volume of quarry product to existing or similar customers. The new quarry proposed on the Project Site will generate a similar number of quarry truck traffic utilising the existing truck and dog trailers to haul quarry product. The new quarry will be likely to employ the same drivers and staff, thereby generating a similar volume of light vehicle movements as well. Therefore, the proposed quarry will have minimal impacts on the local/highway road network, due to the minimal net change in traffic volumes or haulage trips generated.

Internal Quarry Haul Route

All internal quarry haul route options entail utilising the existing, registered rail crossing on the Devereux property proximate to the highway. In discussions John Holland Group, who manage the railway property on behalf RailCorp, Streetwise and Schmidt Quarries have been advised that the existing rail crossing is an approved (and registered) rail crossing. The applicant, David Schmidt, has also received verbal advice from John Holland that if the crossing is to be used fro quarry traffic that a section of the existing rail be first removed and stored adjacent to the existing railway.

It is proposed that quarry truck traffic will travel from the proposed quarry site through to the highway access point via an internal quarry haul route. Two highway access options are put forward in this EIS:

- Option 1: Utilise an existing access point to the highway, in the NE corner of the Project Site, on the outside of an existing large radius curve .
- Option 2: Continuation of the internal haul route from the proposed rail crossing through to the highway.

Either highway access option is considered satisfactory, from a sight distance point of view.

The route of the internal quarry haul route, west of the rail crossing, has been modified such that it avoids the habitat of a threatened lizard species- also found to the south of the existing, registered rail crossing, hence Option 2 which avoids quarry truck traffic potentially running through this habitat.

Intersection Treatment Monaro Highway

The AustRoads Guide to Road Design: Part 4A – Unsignalised and Signalised Intersections, indicates the following is required (for standard vehicles and a reaction time of 2.5 seconds): Approach Sight Distance 179m; and Safe Intersection Sight Distance 262m.

Option 1 has (adjusted) sight distances to the north and to the south of more than 300m. Option 2 has excellent sight distances to the north and to the south, well in excess of the above requirements.In summary, sight distance in either direction is satisfactory to provide safe access to and from the proposed quarry, with minimal impacts on through traffic on the Monaro Highway. However, it is recommended that signage be installed at both approaches to the site, warning drivers of possible trucks turning in and out of the access. It is proposed to upgrade and seal the existing access layout, and ensure it conforms with the AustRoads BASIC intersection layout design.

5.3.2 Aboriginal Cultural Heritage

New South Wales Archaeology Pty Ltd was commissioned to undertake an Aboriginal cultural heritage assessment in relation to this proposal, the results summarised in the following. Refer also to **Appendix I**.

The assessment was conducted in accordance with the NSW Office of Environment and Heritage's (NSW OEH 2011) *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* and *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (NSW DECCW 2010a).

A process of Aboriginal community consultation has been undertaken in accordance with the guidelines as set out in OEH's *Aboriginal cultural heritage consultation requirements for proponents 2010* (NSW DECCW 2010b). Various Registered Aboriginal Parties (RAPs) were consulted for this project.

The study sought to identify and record Aboriginal cultural areas, objects or places, to assess the archaeological status of the proposal area, and to formulate management recommendations based on the results of community consultation, background research, field survey and impact assessment.

A search of the NSW OEH Aboriginal Heritage Management Information System (AHIMS) was conducted for this project (AHIMS Reference: 292605). One Aboriginal object site is listed in the search and is some distance outside and to the south of the subject area. A field survey for Aboriginal areas, objects and places has been conducted. The subject area was found to have sustained low/moderate impacts as the result of previous agricultural land use. No Aboriginal objects were recorded during the field survey. Generally, the subject area has been found to be of very low to low archaeological sensitivity and potential.

As a result of the assessment the following conclusions were made by New South Wales Archaeology Pty Ltd:

- There are no identified heritage constraints in regard to the proposal. The subject area is assessed to be of very low heritage significance.
- No further heritage investigations are required.
- No Aboriginal objects are known to be present in the activity area. An Aboriginal Heritage Impact Permit (AHIP) is not required.

5.3.3 Contamination

Geolyse Pty Ltd was commissioned to undertake Stage 1 preliminary contaminated site investigation (S1 CSI) in relation to this proposal, the results satisfying the relevant precondition under SEPP 55 *per* Preston CJ *Moorebank Recyclers Pty Ltd v Benedict Industries Pty Ltd* [2015] NSWLEC 40 and Dickson C in *Lippmann Partnership Pty Ltd v Canterbury – Bankstown Council* [2017] NSWLEC 1601 dated 9 February 2017 at paras [31-43].

The results are summarised in the following:

- An historical aerial photography survey was undertaken for the site, utilising aerial photography records stretching back to 1959. The aerial photography records, spanning a period of some 62 years, show that the use of the land for grazing purposes, has not significantly altered over that time period.

- No sheep dips or cattle dips are known to be present at the site. The difficult terrain and presence of rocky outcrops are considered likely to have precluded installation of such structures.

- No evidence of stressed vegetation, which may be indicative of soil and/or groundwater contamination, was noted.

- There is no evidence of structures having been present at the site. The potential presence of asbestos containing material (ACM) is considered to be low, based on the absence of development at the site. The potential presence of equipment containing PCBs is considered by Geolyse to be low, based on the absence of development at the site.

- No areas where potential for landfilling (e.g. in-filled dams) have been noted, based on review of historic aerial photography. Based on the site topography Geolyse conclude that there is minimal potential for other 'cut-and-fill' civil works to have occurred at the site. No illegally dumped waste has been noted at the site.

- A search for registered groundwater users located within a 500 m radius of the site did not identify water bearing zones less than 10 m below ground level. A drilling investigation did not identify groundwater to be present within or surrounding the area of the proposed quarry pit.

- The area of the site does not appear to have utilised for any intensive purpose(s). Land uses at the majority of the site have been generally limited to grazing land.

- A search of the NSW EPA on-line register (http://www.environment.nsw.gov.au/prclmapp/) was undertaken in October 2017 for contaminated land notices issued or regulated under the Contaminated Land Management Act 1997. The search indicated that the NSW EPA holds no contaminated land records relating to the site and properties within 1 km of the site.

- Potential on-site sources of contamination which may have impacted the soil, sediment, surface water and/or groundwater at the site include pesticide treatment processes and/or infrastructure.

- Chemicals of potential concern (COPC) associated with the known previous uses of the site and considered to have the potential to adversely impact the underlying soil and groundwater environments are limited to arsenic, organochlorine pesticides and organophosphorus pesticides.

- Significant pesticide usage is not considered to have occurred in areas other than the grazing pasture land. Associated impacts are not considered to be present within the area of the proposed quarry pit or operational areas.

- Geolyse considers that risks to quarry personnel from potential soil contamination impacts may be adequately managed by conducting works in accordance with construction industry standards.

Refer to Geolyse contamination report accompanying this EIS (**Appendix K**).

5.3.4 Land Resources, Agriculture

To put the matter in context, the land proposed for a quarry and associated haul route comprises land with a low land capability and low agricultural value. The following Table 5.3 summarises the potential impact of the proposed quarry development on agriculture and land resources generally.

Table 5.3: Impacts of the Project on land resources & agriculture

Issue	Consideration of impacts
Zoning requirements	The proposed quarry is a permissible use on the land. The provisions of *State Environmental Planning Policy (Mining Petroleum and Extractive Industries) 2007*, *State Environmental Planning Policy (Infrastructure) 2007* and *Cooma-Monaro Local Environmental Plan 2013* permits the proposed development subject to development consent- the latter a permissible use in the RU 1 Primary Production zone. The proposal complies with the zone objectives.
Land use conflict potential	The proposed quarry forms a part of a much larger rural holding of in excess of 2,000ha. The quarry pit and quarry infrastructure area occupy just over 14ha, or 0.7% of the total area of the farm holding. The quarry is to be situated on one of the least suitable/desirable agricultural lands on this larger rural holding.The proposed quarry is located in a sparsely populated rural area with only three rural dwellings located within 2km of the quarry. The quarry is set back a more than acceptable distance from nearest rural dwellings in terms of likely visual impacts and noise/ vibration impacts.Mining and quarrying have already been established in this locality in the past. An existing quarry and an abandoned mine lie either side of Springs Road near the intersection with the Monaro Highway
Land capability and agricultural worth	The small hill containing the volcanic plug, proposed for extraction, comprises a rocky outcrop of very limited agricultural value (Class 7 land capability, Class 5 agricultural suitability). The surrounding lands are suitable for grazing, but not cultivation (Class 6 land capability, Class 4 agricultural suitability). The proposed quarry and haul route do not comprise, nor are they proximate to or likely to have any impact on, Biophysical Strategic Agricultural Land (BSAL). The assessment reasonably identifies potential agricultural land use impacts as low.
Rehabilitation	Schmidt Quarries have a demonstrated track record with rehabilitation of its quarries, including the nearby Nimmitabel Quarry. Revegetated areas are to be carefully managed for a number of years after the initial rehabilitation works, with intensive management over the first few months. This is to promote rapid vegetation growth and development, and addresses any problems arising with vegetation establishment (source: *Managing Urban Stormwater: Soils and Construction, Volume 2E Mines and Quarries* (DECC, 2008). The acoustic bunds and overburden emplacement are to be progressively rehabilitated with native tree and grass species, similar to the treatment employed by the Applicant at the nearby Nimmitabel Quarry site. Rehabilitation and quarry closure (concept) plans have been prepared, including requirements for monitoring and remedial action
Bush fire risk	The land is not bush fire prone. Various mitigation measures are proposed to address fire hazards within the proposed quarry, once operational
Water	No groundwater affected by the quarry. All stormwater to be contained within the proposed quarry pit and quarry infrastructure areas, with no resultant downstream impacts likely
Traffic and livestock	No Travelling stock Routes affected by the proposed development. Low traffic speeds to be observed along the internal quarry haul route
Weed management	Weed management measures have been proposed
Consultation	Consultation with government agencies and local residents has formed a part of this EIS preparation process
Quarry management	Schmidt Quarries's Nimmitabel quarry operates under an integrated risk quarry management system that covers health and safety, environmental management systems and quality maintenance issues based on Australian Standards, in accordance with an existing local council consent and an Environment Protection Licence from the NSW EPA. The intention is to apply the same or similar standards to the conduct of the proposed new quarry at Rock Flat under a site-specific quarry management plan

Given the area of impact associated with the Proposal is located entirely on land with significant limitations for agriculture (refer to Section 4.2.1) which is most unlikely to result in the removal of any significant agricultural land, a detailed review of local agricultural resources of the region is not considered necessary. Moreover, and in addition to the above, the site has been assessed as possessing no contamination potential with no likely conflict with agriculture- the quarrying activities proposed being sufficiently clear of existing nearby agricultural activities.

Extraction from the proposed quarry area has been shown to be both feasible and practical. A quarry pit is proposed to be constructed in stages. These stages are described in detail in Section 2 of the EIS document.

Schmidt Quarries seeks to establish a new quarry, winning hard rock from a volcanic plug, similar to that of their Nimmitabel quarry, some 12km to the south- also a volcanic plug. The aim will be to progressively lower the height of the knoll on top of a small ridge and then to quarry at progressively greater depth. It is proposed that other key parts of the existing landform will be retained around the perimeter of the proposed quarry.

This method of quarrying will minimise impacts in terms of soil erosion potential or land stability.

As the project involves only open pit extraction in a hard (basalt) rock, the risk of subsidence and horizontal displacement are highly unlikely. A noticeable feature of the proposal will be the use of stepped benches running up from the final worked floor to natural ground level. These benches are designed for stability.

There will be minimal loss of usable soil or usable agricultural land, given the rocky terrain encountered over the ground surface on almost all of the land proposed to be used for quarrying and associated quarry area. The topsoil available on site will be used in quarry benches, at the rehabilitation stages and in the establishment of planted areas at project commencement. Overburden containing weathered rock will also be used in rehabilitation as well as in the construction and ongoing maintenance of the internal quarry haul route.

Steps will continue to be taken to ensure that soil erosion and sedimentation impacts are contained within the quarry site. During dry periods, wind erosion will be reduced by standard dust control practices, such as application of water by a water truck. In addition, any erosion of soils overlying cut slopes would not impact local streams because the proposed quarry project provides for an internally drained system.

Surface water runoff would be contained in a sediment pond system designed to accommodate relevant design stormwater flows. While erosion could occur on site, the limited quantity of erodible material, and the implementation practices and features proposed as part of the project, makes this impact less than significant.

5.3.5 Impact on Local Area

The proposed quarry is located in a sparsely populated area of the Monaro Plain, south of Cooma. The remoteness of the quarry can be gauged by the fact that there are only three dwellings within 2km of the quarry, with one of these being the residence of the owner of the quarry site, Mr Peter Devereux. The nearest dwelling is 1.69km away.

Quarrying is to be carried out behind the knoll, shielded from view from nearby dwellings. Additional perimeter plantings of pines- a common sight around all homesteads in the locality- will also soften the visual impact of any changes to the hill resulting from quarry-related activities.The changes in topography brought on by the proposed quarry will only be visible to the nearest rural dwelling, with another, more distant (2.7km) rural dwelling able to discern a gradual loss in the height of the top of the knoll- but not of the quarry or loss in height of the remainder of the knoll.

The buffering effect of the quarry from neighbouring rural uses is reinforced by the rural property land surrounding it. The Project Site forms a small part of a larger rural holding, beneficially owned by the Devereux family, with a combined area of in excess of 2,000ha.

The proposed quarry has direct access to the Monaro Highway, with no necessity for quarry truck traffic to travel over the local council road system before connecting to the highway- a major benefit to local noise and traffic amenity. The proposed internal quarry haul route proposes to cross a disused rail line. John Holland Group, on behalf of Transport for NSW (TfNSW) have advised that the crossing is a registered crossing and can be used by the quarry, subject to the existing rail iron and joining plates being removed prior to use for quarry truck traffic. There are no rural dwellings located proximate to the proposed internal quarry haul route.

In general, the local environmental setting can be characterised as rural with little dust generation activities present. Noise generating activities are limited to the highway, in the main, as well as those associated with agricultural activities or the existing quarry currently operating near the intersection of Springs Road and the Monaro Highway. Acceptable noise, dust and vibration impacts are anticipated to ensue from the proposed quarry operation.

Given the above, it is anticipated that the proposed quarry development will not impact on surrounding land uses in any significant way and will thus satisfy the 'compatibility' test set down in *Project Venture Developments v Pittwater Council [2005]* NSWLEC 191.

5.3.6 Hazard, Risk and Waste Management

The proposed quarry development involves the extraction, crushing and transport of volcanic rock. The extractive resource is an inert material and the quarrying processes involved will generally not pose risks to human health in the locality. The volcanic rock to be won from the quarry site also has the advantage of not containing deleterious material like silica or asbestos, unlike some other hard rock types. It is because of these features that this volcanic rock resource is such a highly sought after resource.

The development proposed contains pollution controls and environmental management measures that will provide a satisfactory degree of protection to the environment.

Section 2.3.11 of the EIS contains details of quarry management measures proposed to minimise hazards, including unintentional or accidental emissions. The design of the quarry ensures that in the event of an accidental spillage of material within the quarry, such as a fuel spill, the impacts will be contained within the excavated quarry area.

The land is not contaminated, nor does it have a history of contamination.There no dangerous goods proposed to be stored on site, and the only material likely to cause concern is diesel fuel. However, the site is not within close proximity to residencies and other land uses, and the diesel is to be stored in accordance with good quarry practice.

The main risks associated with the operation of the quarry have been previously considered in the EIS report. These relate to accidents and emergencies and the measures to be taken when, or if, they occur. Provided the proposed mitigation measures are implemented, no identified risks pose any significant off-site impacts.

The quarry operator is responsible for ensuring quarry worker safety and implementation of training in the work place and safety procedures in the handling of wastes generally- as is currently the practice at Schmidt Quarries' nearby quarry operation at Nimmitabel. Schmidt Quarries will be required to comply with the relevant occupational, health and safety provisions with regard to the carrying out of the quarrying works.

The design of the quarry, involving extraction at increasing depth within a pit, also assists in containing noise and blasting effects, as well as containing stormwater runoff. The good setbacks of the quarry from neighbouring residences in the local area also assists in ensuring that impacts from quarrying operations and associated activities are minimised to an acceptable degree. With the proposed quarry management measures in place, there will be no meaningful risk to the environment in the locality.

The quarry operation is located on a small part of a much larger rural holding (of more than 2,000ha), being private land where members of the public are unlikely to enter. The Devereux farm holding is protected by fencing and a locked gate on the northern boundary, effectively limiting unauthorised, out-of-hours public access to the land containing the proposed quarry site.

Fuel to be stored on the site will be contained in suitably constructed containers- as is the current practice at nearby Nimmitabel Quarry- and located so as to ensure that any potential spillage is contained and cannot enter the drainage system or a natural watercourse. As such, risks are considered to be acceptable.

Measures are already in place to ensure that the risk of any polluting discharge (including dust) is minimal, and that no beneficial uses of adjoining or adjacent lands are affected.

Blasting undertaken at the quarry can be undertaken in a manner that will ensure compliance with applicable requirements in terms of overpressure levels and limits, ground vibration, hours of blasting, and conduct of blasting operations generally. No explosives are to be kept on the site, as these will be brought to the site by blasting contractors on an as-needed basis. The handling, mixing and detonating of explosives is undertaken by the assigned contractor who follows procedures in accordance with the contractor's blast management plan.All blasting and use of explosives is undertaken in accordance with *Work Health and Safety Regulation 2011*.

The *Work Health and Safety Act 2011* require employers and all other workplace parties to consult and cooperate in the management of workplace risks, including operating quarries, in order to protect the health and safety of workers and others who might be at risk from the work. The legislation is supported by codes of practice that provide guidance in achieving the required standard of health and safety. WorkCover NSW must be notified of serious injuries and incidents. Breach of *Work Health and Safety Act 2011* can attract penalty notices, improvement or prohibition notices and prosecution. The project will abide by these legal requirements as well as with any any other applicable requirements such as the *Minerals Industry Safety Handbook*, published by the NSW Department of Mineral Resources in 2002. This Handbook was designed to be used by quarries during the development stage or when operating practices were being reviewed. It is intended to be used by quarries to assess risks, develop risk controls, and when implementing or reviewing workplace practices and procedures.[NOTE: Much of the requirements applicable to quarries are proposed to be incorporated into a proposed quarry management plan, once approved.]

Based on the preceding assessment in the EIS it is considered that the proposed quarry is not considered to be a hazardous or offensive industry under SEPP 33. Nonetheless, appropriate management of dangerous goods on the site will be undertaken in accordance with relevant quarry health and safety requirements.

In view of the low hazard risk of the development and the implementation of mitigation measures proposed, the risk of hazardous incidents will be adequately minimised. The proposed quarry is likely to pose no significant risk to neighbouring land uses or the environment generally.

Refer also to Section 6.6 of the EIS.

5.3.7 Services

The quarry development will be accessed by an internal access route directly to the existing road infrastructure, namely, the Monaro Highway. This will be both a safe and efficient use of existing transportation infrastructure. An upgrade to the intersection of this proposed internal haul route t the highway will be required. The quarry will need to be provided with power from generators, as well as be provided with toilets and waste disposal services.
[NOTE: Under the Extractive Industries SEPP the construction, maintenance and use of toilet facilities, drainage infrastructure, internal roads and sheds is Exempt Development.]

5.3.8 Bushfire

The Project Site is not identified as being bushfire prone land, however the NSW Rural Fire Service, in their advice dated 2 March 2017, advise that a grassland fire hazard exists within the site and that fire mitigation measures be adopted to ensure that fire coming within the site cannot escape the site. This final objective is excessive and out of proportion to a quarry operation that covers just 0.7% of the total area of the existing larger rural landholding of 2,000ha or more. Instead, the objective should be to undertake bush fire protection measures in and around the quarry that protect the quarry operation as well as assist the existing landowner in combatting fires on the property- a more achievable and practical outcome. As development consent is being sought for a hard rock quarry, and not for the subdivision of land or for a residential purposes or a special fire protection purpose within the meaning of the rural fires legislation, a bushfire safety authority under section 100B of the *Rural Fires Act 1997* is not required.

Mitigation Measures, Impacts

The Project adopts various bushfire protection measures to ensure compliance with the aims and objectives identified in clause 1.2 of the document *Planning for Bushfire Protection 2006*- refer Section 2.3.10 of EIS Fire Safety. The following are also relevant:

- The clearing of land for the proposed quarry will provide a sufficient separation distance from any bushfire hazard. A defendable area 20m or more can be provided within the areas to be used for quarry-related uses (more than 14ha of land), which will continue to be maintained to prevent the accumulation of flammable materials. The working quarry areas and hard standing areas can be maintained as an Inner Protection Area (IPA) in accordance with the PBP 2006 standards. These area have sufficient access and turning areas for emergency services. It is considered that these facilities will also provide for safe evacuation while at the same time providing access for emergency services vehicles.

- Related to the above point, regular inspections and maintenance of the curtilage/revegetated areas/hard stand areas within the proposed development are to be undertaken, in accordance with *Planning for Bushfire Protection 2006*.

- The provision for an internal access route will mean that fire fighters can gain quicker access to any fire on the property than currently is the case. The proposed quarry development will benefit from direct access to the Monaro Highway in the event of a fire emergency.

- The proposed sediment basins would provide an adequate water supply for a bushfire emergency.

- Existing AS3959-2009 construction levels are not applicable to industrial buildings or extractive industries. However, it is assumed that any future quarry buildings can be constructed of fire resistant materials in order to reduce potential threat to lives and assets.

- All quarry workplace amenities, offices, workshops, vehicles, plant and storage facilities including those of contractors will have a suitable type and number of fire extinguishers available for use in the event of a fire. AS2444 provides details on the various extinguishers available, their use and effectiveness for various types of fire. All quarry bulk storage of fuels, oils or other products on the quarry site will be in accordance with the relevant Australian Standard. Signage will be located at all extinguisher locations on the quarry site to indicate the extinguisher type and suitability for the fuels, oils or other products stored on site. Fuel storage areas are to be bunded.

- It is proposed to maintain a water truck and pumps on the quarry site, suitable for fire fighting purposes.

- It is proposed to prepare a Bushfire Emergency Response and Evacuation Plan, for inclusion in the final quarry management plan, once development consent is obtained.

5.3.9 Waste Management

In the operation of any well-run quarry, such as that proposed, the objective will be to minimise wastes generated by quarry activities and to control disposal of waste.

Waste management measures proposed at the quarry, including mitigation strategies, have been outlined in detail in Section 2.3.10 of the EIS and relate to the following:

- Waste avoidance measures eg. ongoing maintenance and operation of equipment and the keeping of all equipment in good working order.
- Waste re-use eg. use of waste overburden and rock, including surplus crusher dust, in the building, repair and maintenance of internal roads, quarry working pads, sediment basins, bunds and in general land forming.
- Waste recycling eg. collection of recyclable material (waste oil, metal, glass, and plastic) for collection by Council or appropriate recycling contractor.
- Waste disposal eg. appropriate disposal of all waste by a licensed contractor and/or Council.
- Monitoring and reporting.
- Corrective action should there be an incident.

These waste management measures will be incorporated into a final quarry plan of management, once the Project is approved.

5.3.10 Air Quality

Dust Generation Sources

By their very nature, quarries have the potential to generate dust and minor exhaust emissions. Provided that they are adequately controlled, the potential for any nuisance at any nearby residences can be minimised to a satisfactory degree. The overall objective of any quarry dust management regime will be to achieve acceptable air quality standards through the control of dust movement offsite and within the quarry. Such management measures are to form a part of any final quarry management plan, once the Project is approved.

Quarry activities at the site which have the potential to impact on air quality of the locality include the following:

- Removal of topsoil and overburden, extraction of rock from the quarry face and transportation of rock to the processing plant and away from the site. This includes the operation of plant including earthmoving machinery, digging equipment, loading, and dumping vehicles, haul trucks within the quarry and along the internal quarry haul route.
- Quarry crushing and screening operations, including the depositing of rock into primary and secondary crushers, openings at bins and chutes, quarry screening operations, material transfer points, and movement of crushed rock along conveyors.
- Dust generated by wind blowing over conveyors, stockpiles and disturbed areas, as well as during drilling and blasting operations including drilling of holes, stemming, and blasting activities.
- Dust generated by stockpiles, the loading and transport of quarry product.

Dust Mitigation Measures

The identification of potential sources of dust/air emission from the quarry site and quarry haul route has facilitated the nomination and design of various practical, effective mitigatior measures for the control of dust. These measures are outlined in Section 2.3 of the EIS and include the following:

- Use of water sprays on processing plant and materials stockpiles.
- A water tanker to be regularly used to spray water on working areas and the haul route to reduce dust nuisance.
- Locating the quarry processing plant within the the active quarry area, to reduce exposure to winds and reduce dust potential.
- Proper covering of loads.
- Blasting will be restricted if windy conditions are likely tc carry visible dust emissions beyond the quarry boundary where they could create a nuisance. Another measure is to minimise dust emissions from blasting by sequential firing and using minimum force.
- Proper maintenance and tuning of the vehicles and equipment also assists in avoiding any off-site effects.
- Stabilising and revegetating of topsoil and overburden stockpiles.
- Enforcing a 40 kph maximum speed limit on haul and access roads to minimise dust generation.
- Maintaining vegetated buffers between operational areas and site boundaries. In tis regard, plantings of pines are proposed around the perimeter of the quarry on its eastern, northern and southern flanks.

These measures have, in the main, been used for decades at other quarries operated by Schmidt Quarries, including the nearby Nimmitabel Quarry operation, located some 12km to the south of the Project Site.

Impact Assessment: Air

Vipac Engineers and Scientists Ltd was commissioned by Outline Planning Consultants Pty Ltd to conduct an air quality impact assessment for the proposed hard rock quarry. Refer also to **Appendix G.** It evaluated the potential impacts of air pollutants generated from the proposed quarry, assessed against the criteria specified in the NSW EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* technical document. The air quality impact assessment was carried out as follows:

- An emissions inventory of Total Suspended Particles (TSP), particulate matter (PM10-Particulate matter less than 10 microns in size, PM2.5-Particulate matter less than 2.5 microns in size) and deposited dust for the construction and operation of the proposed quarry was compiled for construction activities (including site clearance) and maximum operational activities (including resource extraction) using National Pollutant Inventory (NPI) and United States Environmental Protection Agency (USEPA) AP-42 emissions estimation methodology for the Project.
- Estimated emissions data was used as input for air dispersion modelling. The modelling techniques were based on a combination of The Air Pollution Model (TAPM) prognostic meteorological model (developed by CSIRO), and the CALMET model suite used to generate a three dimensional meteorological dataset for use in the CALPUFF dispersion model.
- The atmospheric dispersion modelling results were assessed against the air quality assessment criteria as part of the impact assessment. Air quality controls are applied to reduce emission rates where applicable.

The results of the modelling have shown that the TSP, PM10, PM2.5 and dust deposition predictions comply with the relevant criteria and averaging periods at all sensitive receptors, summarised in the accompanying Table 5.4 and **Figures 5.2** and **5.3.**

Table 5.4: Summary of Air Quality Predicted Impacts

Pollutant	Averaging period	Criteria	Maximum Prediction at Any Receptor		Compliance
			Construction	Operation	
TSP	Annual	90 µg/m^3	45.23 µg/m^3	45.31 µg/m^3	Yes
PM10	24 Hour	50 µg/m^3	32.91 µg/m^3	20.65 µg/m^3	Yes
	Annual	30 µg/m^3	15.99 µg/m^3	15.47 µg/m^3	Yes
PM2.5	24 Hour	25 µg/m^3	11.75 µg/m^3	9.09 µg/m^3	Yes
	Annual	8 µg/m^3	7.61 µg/m^3	7.48 µg/m^3	Yes
Dust Deposition	Monthly Total	4g/m^2/month	2g/m^2/month	2g/m^2/month	Yes
	Monthly Increase	2g/m^2/month	Approx. 0g/m^2/month	Approx. 0g/m^2/ month	Yes

(Source: Vipac 12 December 2017 EIS new Quarry at Cooma Air Quality Assessment Table ES-1)

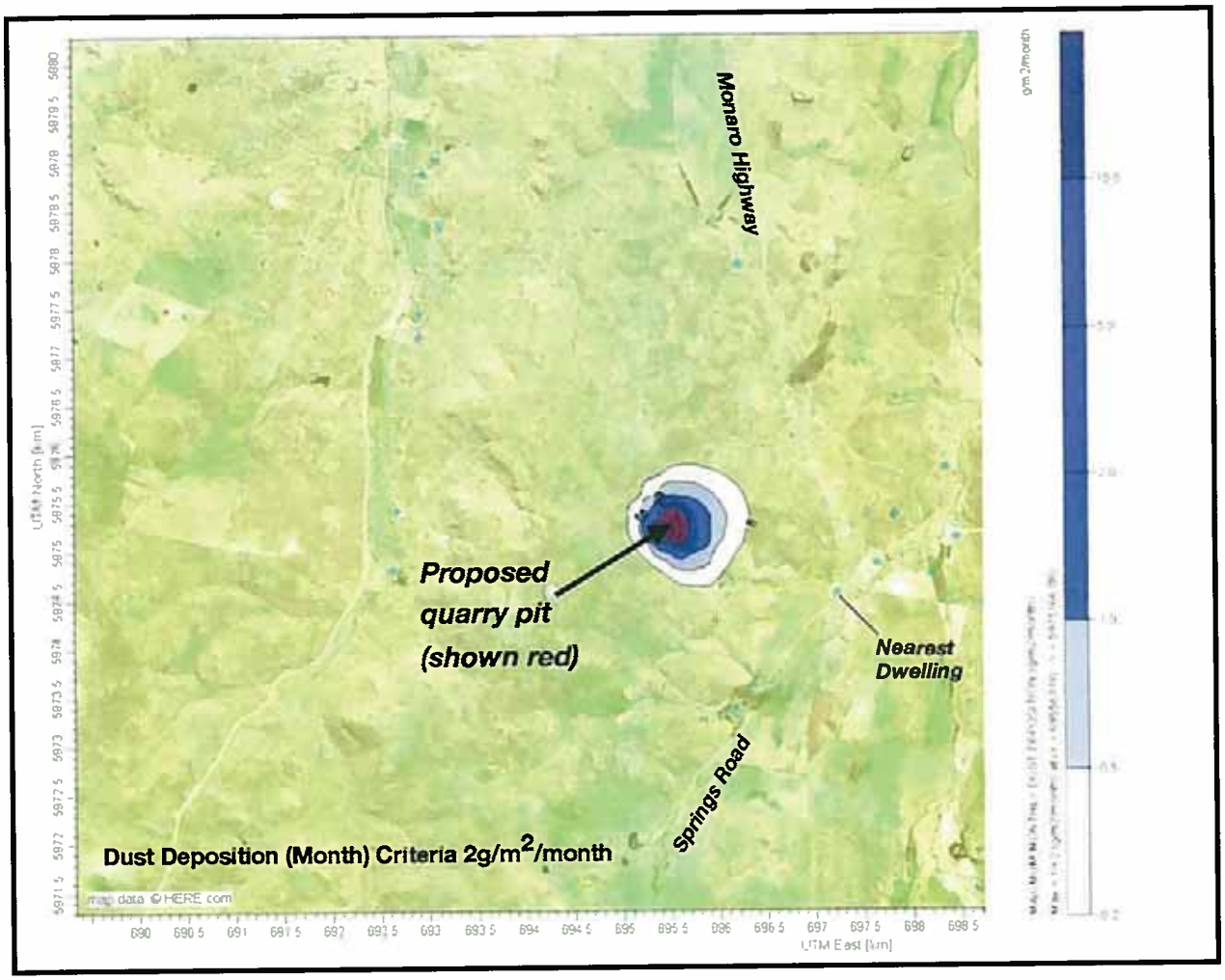


FIGURE 5.2: Predicted Dust Deposition Impacts

(Source: Vipac 12 December 2017 EIS new Quarry at Cooma Air Quality Assessment)

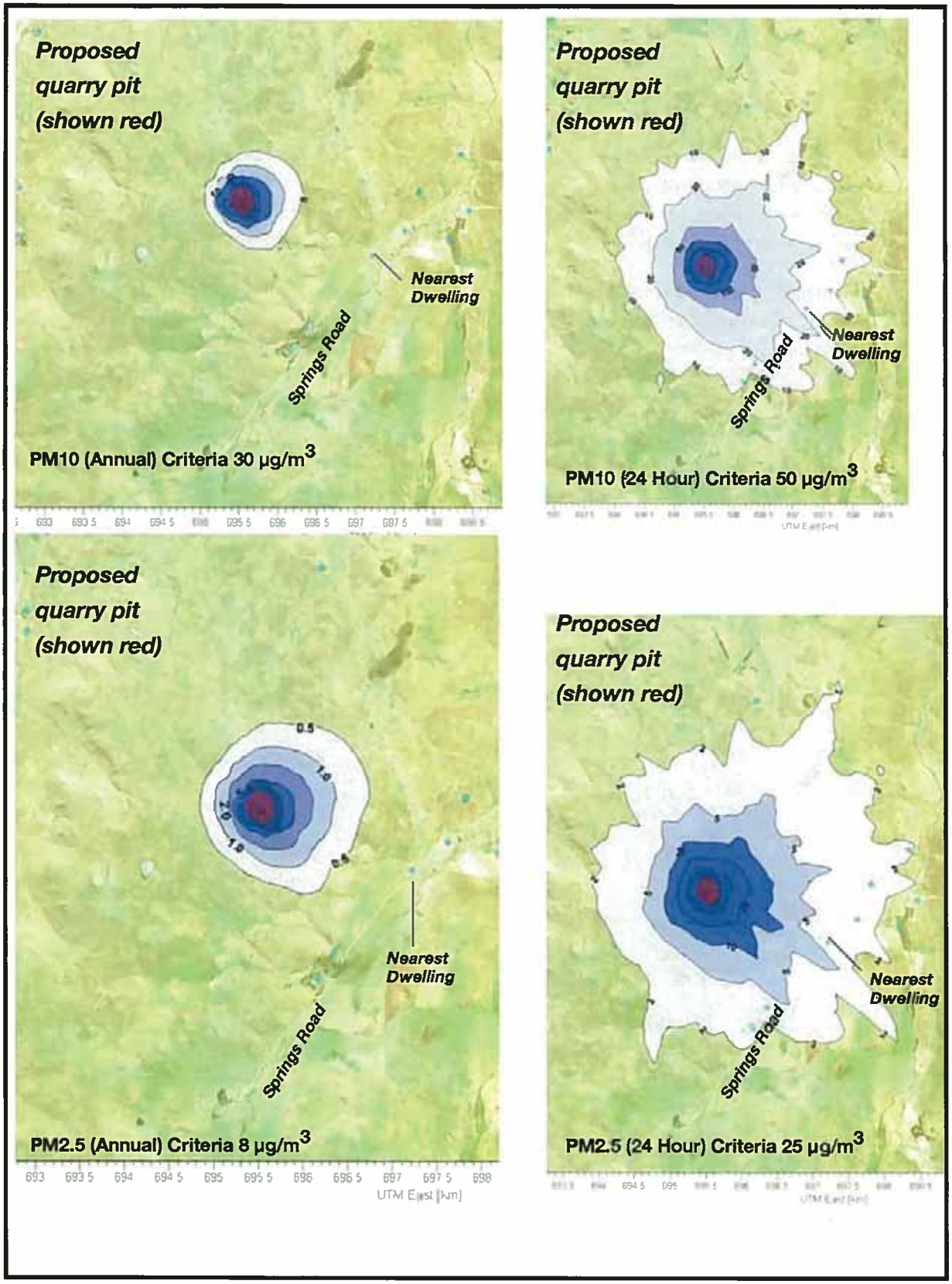


FIGURE 5.3: Predicted Air Quality Impacts (PM & TSP)

(Source: Vipac 12 December 2017 EIS new Quarry at Cooma Air Quality Assessment)

5.3.11 Noise

Overview

Quarries by their very nature produce noise. Rock won from a quarry pit is crushed and processed on site before being transported off-site. Various mitigation strategies are available to reduce the impact of noise on surrounding receivers. Achieving a good setback from neighbouring sensitive uses is a useful first step in mitigating potential noise impacts. In this regard the proposed quarry site is setback more than 1.69km from the nearest residence. On-site mitigation measures can then be implemented, including shielding the quarry behind a hill-as is proposed here.

The detailed acoustical assessment prepared as part of the EIS, contained in **Appendix E**, confirms that the project can achieve full compliance with the relevant noise emission targets set by the EPA. The acoustical assessment, undertaken by Vipac Engineers and Scientists, was based on a site evaluation which included the measurement of the current ambient noise levels, determination of source sound power levels of plant and equipment at Schmidt Quarries Nimmitabel quarry- like the project Site, also a volcanic plug- together with prediction of the impact of noise from the proposed quarry during pre-construction, construction and operation stages of the project. The results of this assessment are summarised in the following.

Existing Environment

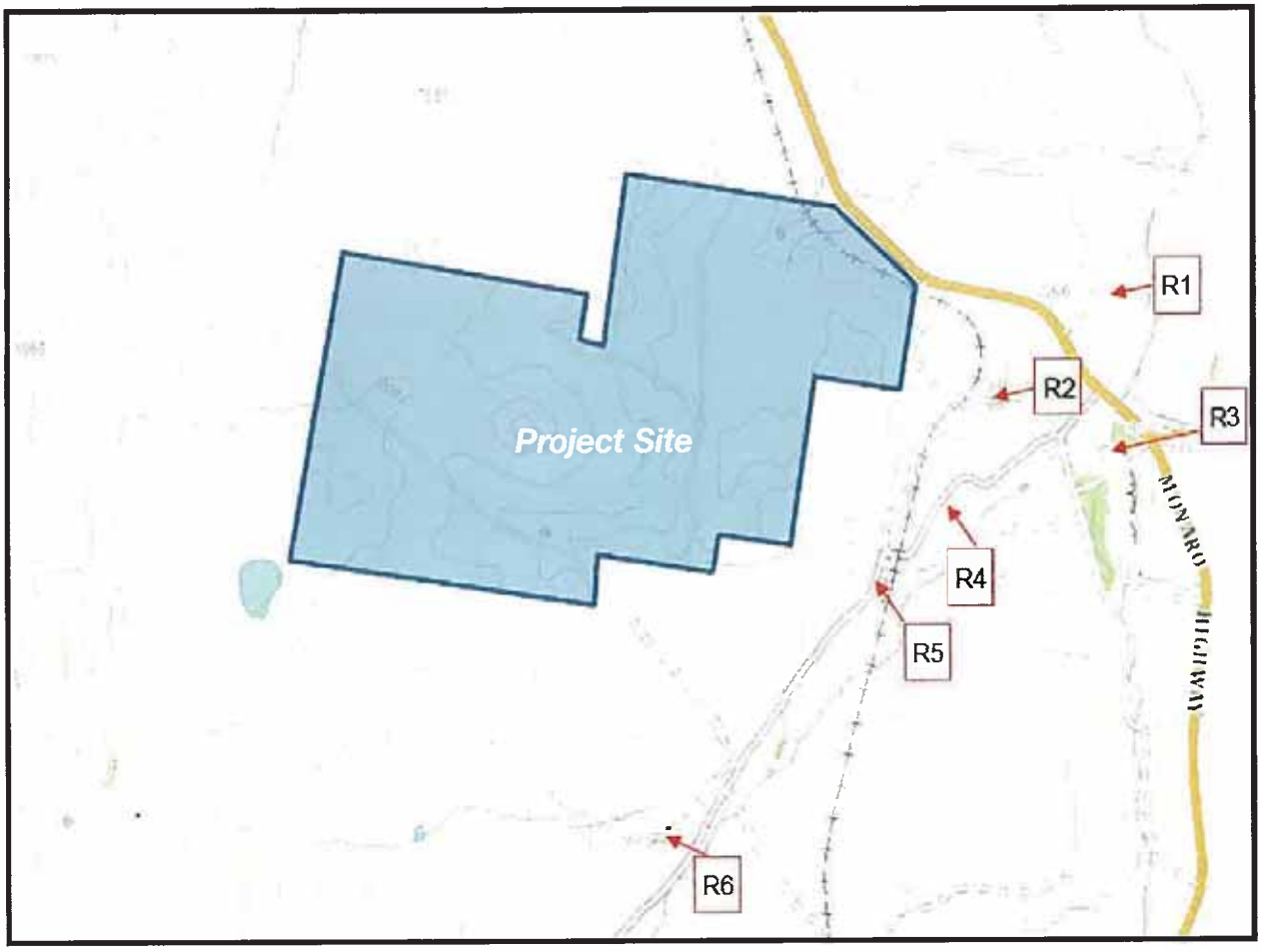


FIGURE 5.4: Noise sensitive receivers to south & east of proposed quarry

(Source: Vipac noise assessment Figure 2-3)

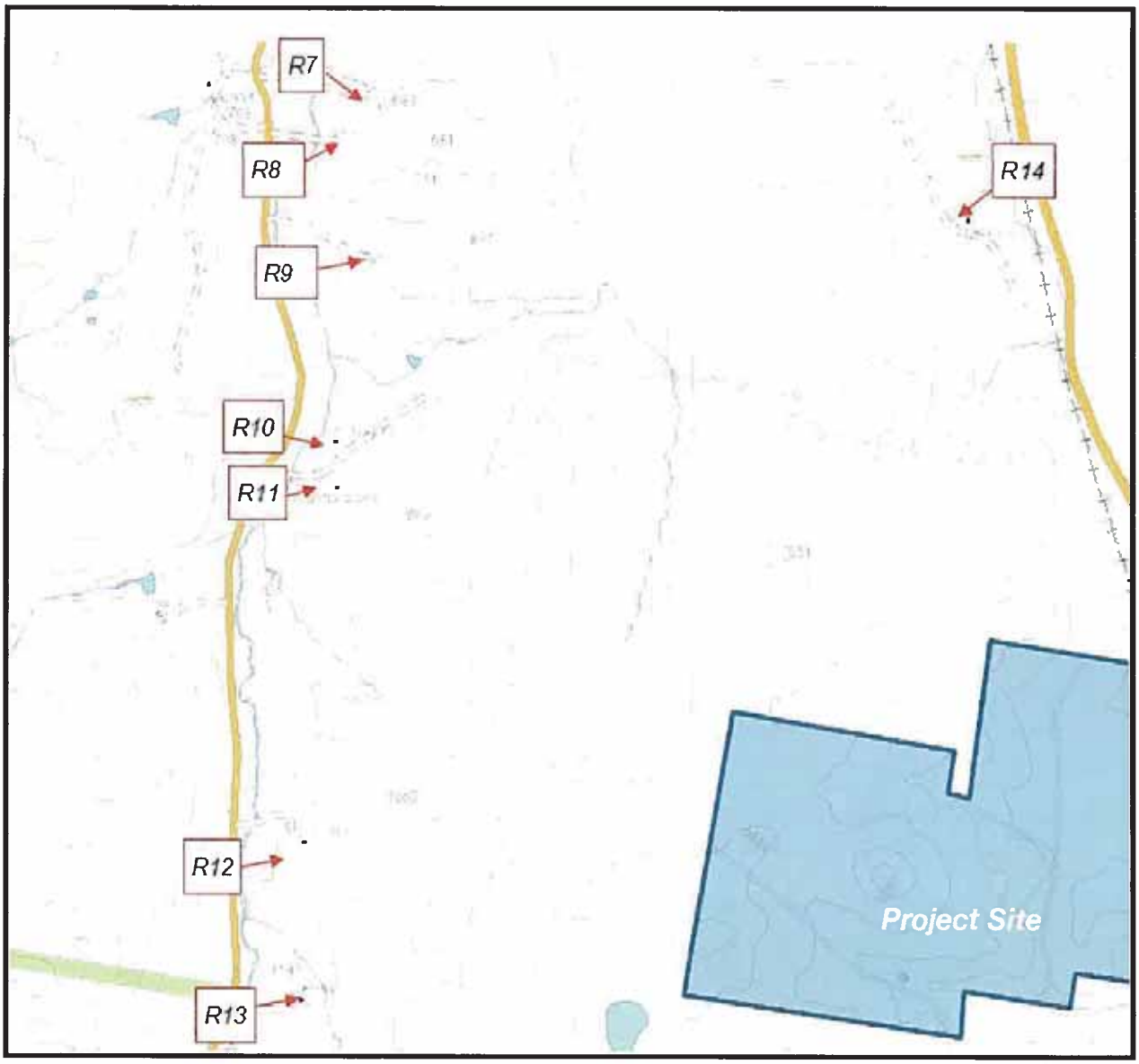


FIGURE 5.5: Noise sensitive receivers to west and north of proposed quarry

(Source: Vipac noise assessment Figure 2-4)

The accompanying **Figures 5.4** and **5.4** illustrate the nearest noise sensitive receives assessed by Vipac.

It should be noted that the quarry site is associated with the resident at R6 and is considered an extension of the quarry development, it being a part of the larger rural landholding owned by the Devereux family. This noise assessment will determine the potential noise impact at R6; however, this receiver should not be considered to adhere to the relevant noise standard.

Noise sensitive receiver R5 is the closest rural dwelling to the proposed quarry site, and noise sensitive receiver R5 the next nearest rural dwelling not associated with the proposed quarry. Noise sensitive receiver R2 is the next closest, however, it is relevant to note that it sits on land adjoining an existing extractive industry (quarry). Like R2, noise sensitive receiver R1 and R3 are relatively close to the Monaro Highway and subject to highway-related noise.

Traffic Noise Assessment

The results of the noise predictions associated with the existing traffic volumes, the future traffic on the highway, and the total traffic noise including the noise generated by the proposed quarry are presented in Table 5.3. The results only consider receivers close to the highway. Allowances have been made in the calculations for forecast growth in highway traffic levels.

Table 5.3: Existing and Future Traffic Noise Levels, Impact of Quarry Traffic LAeq 15hour dB(A)

Residential Receiver	Existing Road Noise	Future Road Noise 2027		Noise Criteria (Day)
		Highway	Total (with Quarry Truck Traffic)	
R1	40.8	41.4	41.7	60
R2	44.4	45.0	45.3	60
R3	46.5	47.1	47.4	60
R14 ("Manaroo")	41.2	41.8	42.0	60

(Source: Vipac noise assessment December 2017)

Vipac conclude that the predicted existing and future traffic noise levels at the receivers located off Monaro Highway satisfy the applicable noise criteria during daytime.

The increase in traffic noise levels from the traffic generated by the proposed Quarry, 0.6-0.9 dB, is also expected to comply with the relative increase criteria requirements of the Road Noise Policy, whereby increases in road traffic noise levels should not exceed the existing road traffic noise levels by more than 12 dB. Refer **Figures 5.4-5.6.**

Vipac conclude that the traffic generated by the proposed quarry would have very little effect on the current noise environment. This aspect was also discussed in the StreetWise traffic impact assessment noting that the traffic currently associated with the quarry operator's Nimmitabel quarry is expected to be transferred to the proposed Quarry when the operations in Nimmitabel cease.

In regard to predicted traffic noise impacts arising from the proposed quarry, Vipac conclude by stating:

> *"The predicted noise generated by the proposed Quarry operations and Quarry traffic on Monaro Highway would comply with the daytime noise criteria. The increase in traffic volumes by year 2027 resulted in less than 1 dB change in noise levels, thus not adversely affecting the current noise environment."* (p.28 of the Vipac assessment)

Quarry Noise Assessment & Noise Policy or Industry (2017)

The quarry noise assessment considered likely noise generated by the quarry under two scenarios: at establishment (construction) phase; and once the quarry is operational-referred to as Stages 2-3 in the Vipac report.

The activities associated with the initial development of the quarry will comprise of excavators removing overburden material, a drill extracting material required for the site construction, trucks moving the material, a bulldozer and a grader working on the road and processing area, and generators providing electricity.

Noise modelling was undertaken to assess the potential noise impacts associated with the initial development phase of the proposed quarry under the Industrial Noise Policy (INP) as well as under the new Noise Policy for Industry (NPI).

The Noise Policy for Industry (2017) replaces the NSW Industrial Noise Policy (2000) when assessing noise from all new developments, including quarries ('extractive industries').

The EPA website advises that the Noise Policy for Industry (2017) will take effect immediately upon its release and should be referenced in relevant Secretary's Environmental Assessment Requirements (SEARs) for new industrial development issued after the policy release date.

Where SEARs were issued before the release of the new policy (which is the case here), and have not been modified, the assessment requirements referenced in the SEARs will apply for a period of two (2) years from the date of issue of the SEARs consistent with the provisions in the Environmental Planning and Assessment Regulation 2000, Schedule 2, Part 2, 3 (7).

In any case, it is understood that the Noise Policy for Industry (2017) will be applied to any new Environment Protection Licence (EPL) issued following the grant of any development consent. It is for this reason, from a practical point of view, that the compliance of the proposed development with the Noise Policy for Industry (2017) has also been assessed for the quarry operation, once established, as set out in the following.

Quarry Noise at Establishment

Table 5.4: Noise Levels Establishment (Construction) of Proposed Quarry LAeq dB(A)

Residential Receiver	Neutral Conditions	Worst Case Conditions	Noise Management Levels (Standard construction hours)
R1	23	34	40
R2	25	35	40
R3	22	32	40
R4	23	33	40
R5	21	31	40
R6 'Milton Park' Devereux property	12	22	40
R7	7	17	40
R8	1	11	40
R9	5	14	40
R10	22	32	40
R11	10	19	40
R12	8	18	40
R13	5	15	40
R14 ("Manaroo")	13	23	40

(Source: Vipac noise assessment January 2018)

The predicted results associated with the initial development phase of the proposed Quarry indicate that the noise levels are within the applicable Noise Management Level criteria at all of the noise sensitive locations. Therefore, there is no mitigation measures required in association with the construction stages of the quarry.

Regardless, in accordance with standard practice at operational quarries and mines throughout NSW, Vipac recommended that a Noise Compliance Management Strategy should be implemented for the quarry. This can be incorporated into and form a part of a future quarry management plan. This should comprise of a noise monitoring program whereby the quarry operational phase noise emissions are assessed at the nearest noise sensitive receptors by way of an attended environmental noise monitoring survey at a frequency to be determined in consultation with NSW EPA.

Refer to **Figure 5.4**, showing predicted noise contours for this stage of the quarry (worst case meteorology).

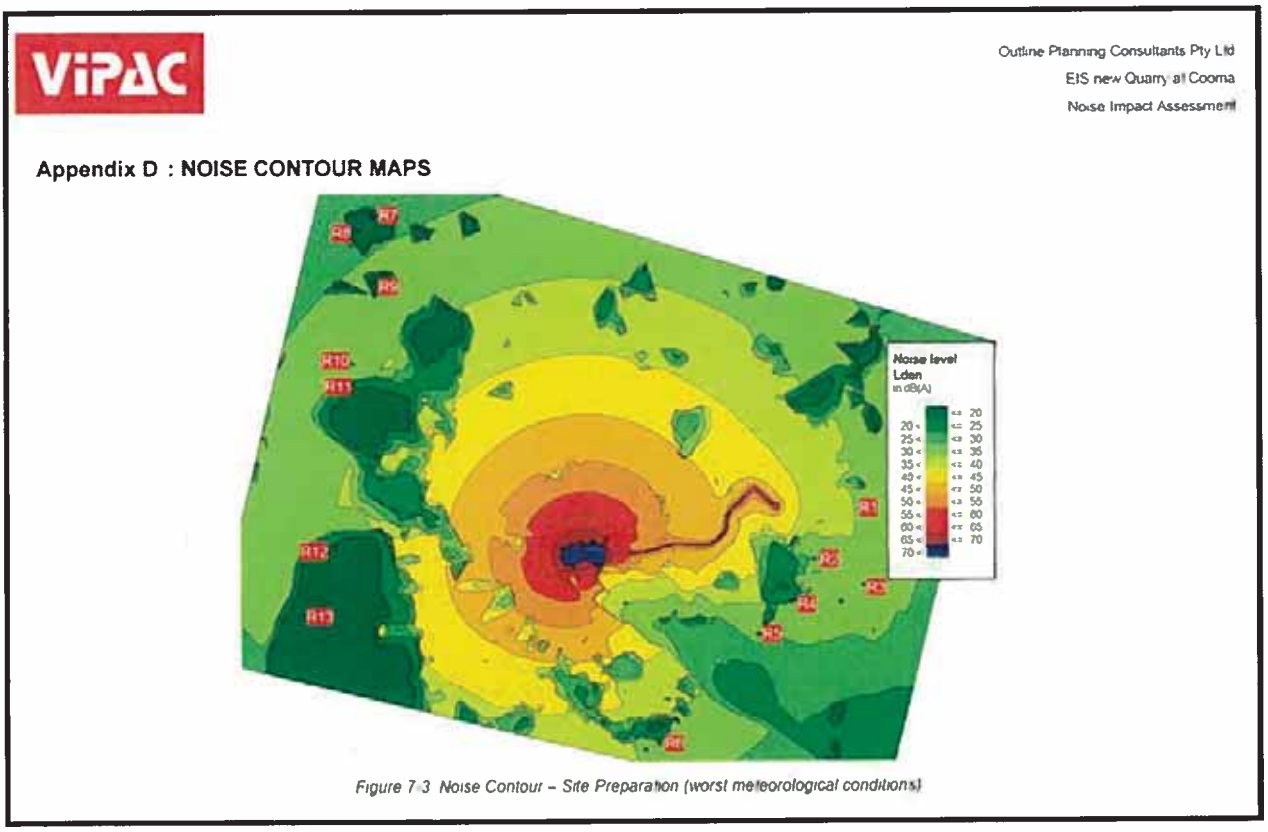


FIGURE 5.6: Noise contours quarry site preparation

(Source: Vipac noise assessment January 2018 Appendix D Figure 7-3)

Quarry Noise: Operational Quarry

The noise generated by an operating quarry on the project Site- described as Stages 2 and 3 in the Vipac report- were assessed under the following scenarios:

- Noise generated by quarry under the criteria set down in the *NSW Industrial Noise Policy (2000)*, which still applies to any EIS assessment of this quarry development.
- Noise generated by quarry under the criteria set down in the *Noise Policy for Industry (2017)*, which is understood will be applied to any new Environment Protection Licence (EPL) issued following the grant of any development consent for a new quarry on the Project Site.
- Noise generated by quarry without an acoustic bund around the quarry.
- Noise generated by quarry without an acoustic bund around the quarry. Refer Figure s 2.2-2.4 illustrating the location and extent of this treatment.
- Noise generated under neutral and worst case conditions.

It is relevant to note that applying the old *NSW Industrial Noise Policy (2000)* under worst case conditions and without any acoustic bunds, there were three (3) minor noise exceedances recorded at nearby residences, one of these being at the home of the owner of the Project Site. However, applying the *Noise Policy for Industry (2017)*, under worst case conditions and without any acoustic bunds, there were no noise exceedances predicted. Notwithstanding the fact that the above were all assessed under worst case conditions, and applying the precautionary principle, acoustic bunds have been incorporated into the design of the proposed quarry. Refer **Figures 5.7-5.8.**

Table 5.5: Noise Levels Operational Stage of Proposed Quarry LAeq dB(A)- No Acoustic Bund

Residential Receiver	Stage 2		Stage 3		Noise Criteria INP (2000)	Noise Criteria NPI (2017)
	Neutral	Worst case	Neutral	Worst case		
R1	25	35	22	32	41	41
R2	25	35	19	29	41	41
R3	24	34	19	29	41	41
R4	26	36	16	26	35	40
R5	28	38	19	29	35	40
R6 ('Milton Park')	22	33	22	33	35	40
R7	6	15	1	10	35	40
R8	0	9	1	6	35	40
R9	3	13	1	9	35	40
R10	20	30	15	25	35	40
R11	7	17	2	12	35	40
R12	6	15	3	13	35	40
R13	4	14	1	11	35	40
R14 ("Manaroo")	14	25	13	28	35	40

(Source: Vipac noise assessment January 2018)

The predicted noise impact associated with the proposed quarry on the noise sensitive receivers during neutral weather conditions ranged from 1 dB(A) to 28 dB(A) for Stage 2 and from 1 dB(A) to 22 for Stage 3. These predicted noise levels during the daytime are within the applicable Project Specific Noise Level criteria.

In the worst case weather scenarios, an adverse wind of 3 m/s was assumed, resulting in noise levels approximately 10 dB higher than in neutral weather. The ranges were 9 dB(A) to 38 dB(A) and 6 dB(A) to 33 dB(A) for Stages 2 and 3, respectively.

The NSW Industrial Noise Policy (2000) criteria for daytime was exceeded at receivers R4 and R5 in Stage 2 by approximately 2-3dB. [NOTE: Without acoustic bund] However, noise prediction values for stages 2 and 3 with neutral and worst weather conditions comply with the Noise Policy for Industry (2017). The proposed screening bunds and sediment barriers can act as noise barriers, and their effect was thus also predicted- refer accompanying Table 5.6.The results in Table 6-3 indicate that after introducing the screening bunds and the sediment barrier, the noise levels comply with the INP and the NPI in both neutral and worst case weather scenarios.

Table 5.5: Noise Levels Operational Stage of Proposed Quarry LAeq dB(A)- With Acoustic Bund

Residential Receiver	Stage 2		Stage 3		Noise Criteria INP (2000)	Noise Criteria NPI (2017)
	Neutral	Worst case	Neutral	Worst case		
R1	24	34	22	32	41	41
R2	24	34	18	26	41	41
R3	23	33	19	29	41	41
R4	20	30	15	25	35	40
R5	22	31	18	28	35	40
R6 ('Milton Park')	17	27	17	27	35	40
R7	5	15	0	10	35	40
R8	0	9	0	5	35	40
R9	3	12	0	8	35	40
R10	19	30	14	24	35	40
R11	7	17	2	12	35	40
R12	6	15	3	13	35	40
R13	4	14	1	11	35	40
R14 ("Manaroo")	14	24	12	23	35	40

(Source: Vipac noise assessment January 2018)

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FIGURE 5.7: Noise contours quarry operation at commencement

(Source: Vipac noise assessment January 2018 Appendix D Figure 7-4)

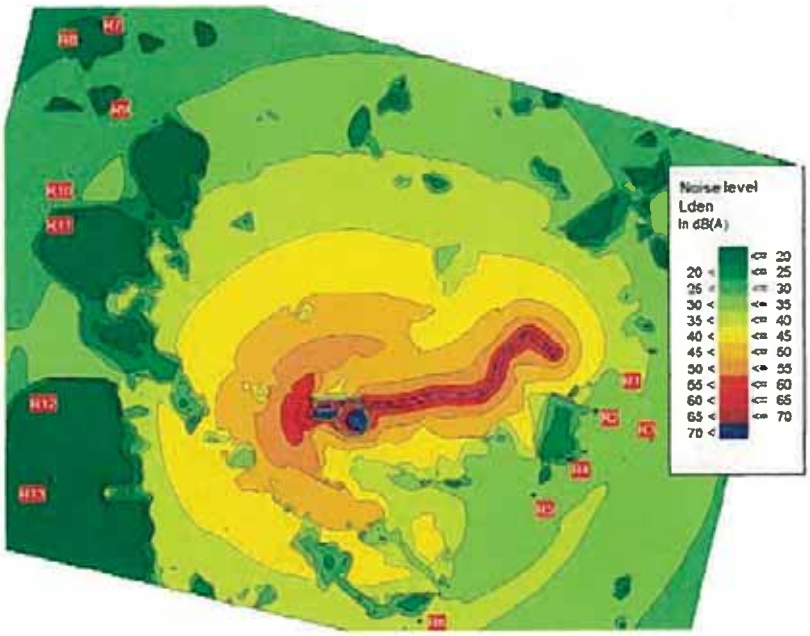


Figure 7-4 Noise Contour – Active Quarry start with bund (worst meteorological conditions)

17 Jan 2018

VIPAC

FIGURE 5.8: Noise contours with quarry pit operation

(Source: Vipac noise assessment January 2018 Appendix D Figure 7-4)

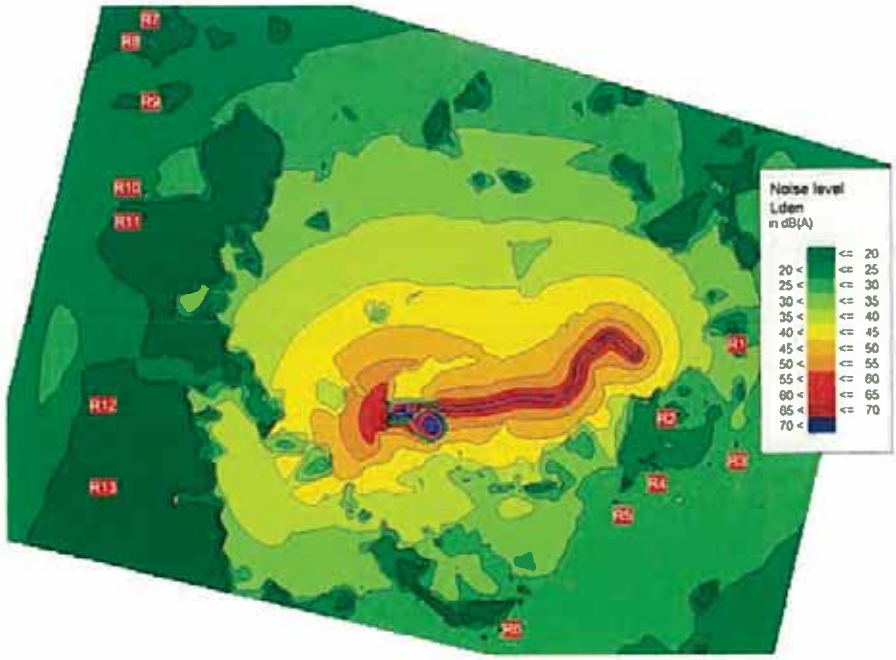


Figure 7-5 Noise Contour – Active Quarry Pit with bund (worst meteorological conditions)

17 Jan 2018

5.3.12 Blast Impacts

Vipac Engineers and Scientists Ltd (Vipac) was commissioned to conduct a blast impact assessment for the proposed new quarry (*Rock Flat Quarry Blast Impact Assessment* dated 24 January 2018- **Appendix F**). Ground vibration and airblast overpressure are two common environmental effects of blasting that can cause human discomfort. The quarry would operate from 7:00 am to 6:00 pm Monday to Friday, and from 7:00 am to 2:00 pm on Saturdays. Blasting would only occur between the hours of 9:00am and 3:00pm Monday to Friday.

Blasting Overpressure and Ground Vibration Standards

Blasting is to be undertaken within accepted ground vibration and air blast overpressure requirements.The Australian and New Zealand Environment Conservation Council (ANZECC) provides the following guidelines to minimise the annoyance due to blasting overpressure and ground vibration.The recommended maximum level for airblast overpressure is 115 dBL. This level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. However, the level should not exceed 120 dBL at any time.The recommended maximum level for ground vibration is 5 mm/s peak particle velocity. This level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. However, the level should not exceed 10 mm/s peak particle velocity at any time.

Refer Section 2.3.4 of the EIS for further details of blasting protocols and mitigation measures proposed, to be integrated into an overall quarry management plan once the quarry project is consented to.

Summary of Findings: Blasting

Vipac's summary of findings and recommendations is set out in the following:

- All noise sensitive receptors are located 1600m or more from the nearest future quarry pit boundary. Noise sensitive receptors are located in all directions from the proposed quarry. The closest dwellings are located in the quadrant south to east of the quarry.
- The Vipac report presents conservative prediction methods for ground vibration and airblast overpressure, and provides worst case predictions for blasting at the proposed quarry based on these methods. The predicted blast impacts are assessed according to the ANZECC guidelines.
- The assessment finds that blast impacts from the proposed quarry can be readily controlled within acceptable levels. This is because the minimum separation distance between the quarry pit and the nearest receptor is sufficient for adequate control of the propagation of ground vibration and airblast overpressure.
- Consideration of future blast impacts shows that acceptable levels can be achieved using typical blast designs and good blasting practice.
- Vipac recommend that all blasting conducted at the proposed quarry site be monitored using best practices and permanent vibration monitoring pads as much as possible, with monitors located as close as practical to the sensitive receptors, between the blast and the receptor. It is proposed to regularly monitor blast results measured from the nearest rural dwelling (Dwelling 1).
- Vipac also recommend that a Blast Management Plan should be produced and implemented to ensure compliance with regulatory authority conditions. It should include the use of routinely updated vibration and overpressure data in the design of blasts, which is a vital step in managing impacts in sensitive areas. This Plan will form a part of a proposed quarry management plan, to be prepared once consent has been obtained for the quarry.
- A Maximum Instantaneous Charge of 225kg has been recommended in the Vipac report, based on the blast modelling undertaken.

5.3.13 Water

Overview

Geolyse was engaged by Outline Planning Consultants Pty Ltd to prepare a Water Management Report for the site of the proposed hard rock quarry as a component of an Environmental Impact Statement (EIS) to address the Secretary's Environmental Assessment Requirements (SEARs) for the proposed operation. Refer **Appendix H**.

The key features of the project that have the potential to impact upon water resources include:

- The proposed quarry operations including drilling and blasting, excavation, transport and processing and haulage of material off site.
- The requirement for water at the quarry for processing of material and dust suppression.
- Construction of additional infrastructure includirg sediment basins.
- New plantings at commencement as well as rehabilitation of disturbed areas.

Key Features of Site

The key features of the Project Site and quarry site include the following:

- The topography of the site is undulating with an irregular ridge-line present in a general west-east alignment across the site. The ridge-line feature results in the gradient sloping north in the northern portion of the site and sloping south in the southern portion of the site.
- The proposed quarry is located on pasture grazing land and is surrounding by similar land uses. No existing surface water quality data was available for the quarry site or surrounding land.
- The site sits at a natural high point in the topography and as such runoff from the site is at the headwater of the ephemeral drainage lines to the north and south of the site. Due to the location of the site at the natural highpoint surface water flows within the nearby drainage lines will be limited and will have no impact on the site.
- The site is not directly linked to any existing watercourses and as such relies on surface water runoff from the site for operational and dust suppression requirements. Collected water will be reused within the site and as such no extraction of surface water outside of the controlled area or groundwater will be undertaken. As a result a water extraction licence is not required for the project.

Clean Water Diversion Measures

Clean water diversion drains will be designed to divert clean water away from disturbed areas and be discharged at appropriate locations with adequate scour protection to prevent erosion occurring. The clean water diversion drain catchments are relatively small. The clean water diversion drain will be designed to convey the 1 in 20 year Average Recurrence Interval (ARI) peak flow from the catchment upstream of it in accordance with *Managing Urban Stormwater-Soils and Construction- Volume 2E Mines and Quarries (DECC, 2008)*. The clean water diversion drain will be constructed prior to any quarry expansion works and will be amended as required as the expansion progresses to ensure clean water from upslope areas is diverted away from disturbed areas.

'Dirty' Water Management

The 'dirty' water catchment will be designed to collect and convey all stormwater runoff from disturbed areas and convey it to the two proposed sediment basins- one serving the quarry infrastructure area, the other serving the quarry pit. The dirty water catchment drains and sediment basins have been designed to convey and store flows in accordance with *Managing Urban Stormwater- Soils and Construction-Volume 2E Mines and Quarries (DECC, 2008)*. Details are as follows.

Consistent with Section 6.1 of *Volume 2E Mines and quarries (DECC, 2008)* the following design parameters were adopted for the purposes of calculating sediment basin sizing [NOTE: The Project will be adopting larger sediment basin capacities, in order to entrap all stormwater flows/volumes generated within the active quarry areas.] :

- Type D soil classification.
- Soil hydrologic group D.
- Erodibility (K-factor) of 0.05.

A 95th percentile 5-day design criteria was adopted (39.1mm for Cooma; Table 6.3a (Landcom, 2004)).

The required sediment basin volume was determined as:

V = settling zone + sediment storage zone

Quarry Infrastructure Area Basin Calculations

The settling zone was calculated in accordance with the equation provided in Section 6.3.4(i) of Managing urban stormwater: soils and construction (Landcom, 2004) using the adopted default parameters. The capacity of the sediment storage zone was calculated as 50% of the settling zone volume. The quarry infrastructure area catchment is 6.18 ha, however during the initial stage of the project some of the quarry area will drain to the infrastructure area basin. An allowance of 2 ha has been made for the initial stage of the quarrying draining to the infrastructure area basin. Therefore A = 8.16 ha ('worst case' catchment area).

Settling Zone = 10 x Cv x A x R

= 10 x 0.64 x 8.16 x 39.1

SZ = 2,042 m^3

Storage Zone = 50% of SZ

= 1,021 m^3

Total Volume = Settling Zone + Storage Zone

= 3,063 m^3

The calculated total quarry infrastructure area sediment basin storage capacity (minimum) was 3, 063 m^3.

Quarry Pit Area Basin Calculations

The settling zone was calculated in accordance with the equation provided in Section 6.3.4(i) of Managing urban stormwater: soils and construction (Landcom, 2004) using the adopted default parameters. The capacity of the sediment storage zone was calculated as 50% of the settling zone volume.

The quarry pit area catchment is 7.03 ha, therefore A = 7.03 ha.

Settling Zone = 10 x Cv x A x R

= 10 x 0.64 x 7.03 x 39.1

SZ = 1,759 m^3

Storage Zone = 50% of SZ

= 880 m^3

Total Volume = Settling Zone + Storage Zone

= 2,638 m^3

The calculated total quarry infrastructure area sediment basin storage capacity (minimum) was 2,638 m^3.

Final Landform

Following completion of quarrying activities the processing and stockpiling areas will be backfilled with stockpiled overburden and topsoil and revegetated. The final landform of the processing and stockpiling areas will be shaped to slow runoff and allow vegetation to establish to create a stable vegetated surface that produces clean runoff. The dirty water catchment drains and sediment drains will be maintained on the site until the site revegetation has fully established and no dirty water runoff is occurring. The final landform of the quarry infrastructure area will be shaped to create a free draining surface with no ponding. The main pit area will retain its final form, with some backfilling.

Groundwater

Drilling around the quarry site by Schmidt Quarries reveals no evidence of groundwater. It is not proposed to extract groundwater for use within the quarry and all surface water will be managed on site to avoid any interaction with groundwater. Accordingly, it is not proposed to install and groundwater monitoring points in the vicinity of the site.

Water Balance

A daily water balance model was used to assess the overall water cycle for the quarry operations. The expected quarry output in a normal year is expected to be 150,000 tonnes of product, of which 20% is crusher dust and road base, with the remaining 70% being aggregate. The maximum production from the quarry will be 280,000 tonnes when a major project occurs (56,000 tonnes of crusher dust and road base, 224,000 tonnes of aggregate). Process water requirements for a normal year will therefore be approximately 6.5 ML whilst in a maximum production year the requirement will increase to 9.62 ML. [Assumes that 1.5% of process water will be for aggregate; 6% for crusher dust; and 6% for road base].

Table 5.6: Quarry Water Balance Results (ML)

Rainfall Year	Catchment Runoff+ Pumping from Quarry Basin	Basin Evaporation (both basins)	Basin Direct Rainfall (both basins)	Process Water	Dust Suppression	Water Balance (ML)
Fully Developed Quarry						
Average	19.44	10.04	6.87	3.61	2.90	+9.76
10%ile	23.44	6.09	3.99	3.61	2.90	+14.83
50%ile	25.3	7.92	5.63	3.61	2.90	+16.50
90%ile	29.4	8.46	8.90	3.61	2.90	+23.33
Stage 1 Quarry						
Average	13.32	6.54	4.02	3.61	2.90	+4.29
10%ile	10.81	5.20	2.49	3.61	2.90	+1.59
50%ile	12.40	6.52	3.93	3.61	2.90	+3.30
90%ile	19.59	5.81	5.54	3.61	2.90	+12.81

(Source: Geolyse water balance assessment January 2018)

The water balance assessment by Geolyse (Table 5.6 above) finds that there is adequate capacity in the site surface water management system to supply the water demands across the site during normal operating years, even at maximum production. This indicates there is adequate water on site to ensure effective dust control.

Moreover, it is concluded that the proposed surface water management system can be managed to meet relevant design guidelines. Refer to the Geolyse report accompanying this EIS for further details.

Surface and Groundwater Impacts

In regard to potential surface water and groundwater impacts:

- A preliminary site investigation and review of available bore data shows that groundwater levels are at depths greater than 10 m below current site levels. It is not proposed to extract groundwater for use in the development and there is minimal risk of contaminants enter groundwater from the development. Therefore there the development is not expected to have any impact on groundwater. The project was assessed against the *NSW Aquifer Interference Policy* and as the proposed development is not defined as an aquifer interference activity no further assessment under the *Aquifer Interference Policy* was required.

- The proposed development was assessed against the *NSW Farm Dams Policy and Harvestable Rights Order*. As the proposed water management system captures, contains and recirculates drainage and/or effluent that conforms to best management practice and prevents the contamination of downstream watercourses the proposed sediment basins are exempt from the Harvestable Rights calculation. The proposed quarry footprint is located a minimum of 40 m away from the nearest drainage line and hence is not considered an integrated development relating to water.

- The water management measures detailed in the EIS demonstrate how water will be managed on the site and will prevent any uncontrolled discharges of runoff from disturbed areas. The water balance shows that the site can be operated without exceeding the discharges from the site as specified in *Managing Urban Stormwater-Soils and Construction Volume 2E Mines and Quarries (DECC, 2008)*. Using the water management strategies outlined in the EIS the proposed development can be operated with no adverse impact on water quality.

- There are no direct downstream water users from the proposed development site. The site is not directly linked to any drainage lines and hence any the development will not impact any downstream water users.

- The site is not directly linked to any riparian areas or watercourses and the proposed water management measures will ensure that no uncontrolled discharges occur from disturbed areas. Hence the proposed development will not have any impact on the riparian and ecological and values of watercourses.

- The site is not linked directly to any drainage lines. The nearest drainage lines are ephemeral and discharges to these drainage lines will be controlled. The proposed development will not have any impact on watercourses that rely on environmental flows.

- The proposed development will change the landform of the site, however the changes to catchments will be limited. During the construction and operation phases the site will control discharges from disturbed areas. The final landform of the processing and stockpile areas post operation phase will be revegetated to a similar state as that exists currently. Therefore the site will have no impact on flooding.

- Satisfactory erosion and sediment control measures are proposed. The proposed sediment basins have been sized for erosion and sedimentation requirements, however the final design volume has been dictated by the requirement to contain additional water to buffer during extended dry periods. Post-closure, the site will be rehabilitated with (native tussock) vegetation matching the currently undisturbed areas of the site and hence the surface water runoff regime is expected the closely match that of the current site. The water management system will remain in place and will be maintained until the site has stabilised and is fully revegetated. Monitoring of the site post operation will ensure that discharges from the site are controlled until the surface water runoff quality meets required criteria.

- Satisfactory cumulative impacts are predicted. No significant impact on runoff volume is expected due to the proposed works in the operational phase. The site will be rehabilitated post operations and the fully rehabilitated site will match closely the existing surface water runoff regime. The development will have no impact on groundwater as no extraction of groundwater is proposed and groundwater levels are at depths greater than 10 m below the existing levels.

5.3.14 Visual Impact Assessment

Visual Impact Principles

A detailed visual appraisal has been undertaken for the Project Site and surrounds, to establish the approximate visibility of the site from any surrounding receptors in the vicinity, including from key vantage points on the Monaro Highway back to the proposed quarry on the Project Site- refer to Section 4.5 of the EIS- Landscape.

This section of the EIS provides an analysis of the available views to the Project Site from both the Monaro Highway and from nearby local residences and likely impacts on those views. Many of these viewpoints represent views from specific visual receptors described in the subsequent visual effects section. The impact assessment also has regard for established planning principles in this regard, as set down by the NSW Land and Environment Court. In the context of this proposed quarry development, overall visual impact is determined by combining the sensitivity of the receptor in the landscape with the magnitude of potential visual changes likely to result from the proposed quarry.

In this regard the steeper areas on the Project Site possess a Medium Scenic Quality, with the lower lying areas possessing a Low Scenic Quality. The elevated knoll possesses a Medium Visual and Landscape Sensitivity when viewed from Dwelling 1, with a Medium-Low Visual and Landscape Sensitivity from other viewing locations- including from the Monaro Highway. The identification visual impact of the proposed development is assessed in the following. Refer Table 5.3 below.

Table 5.3: Assessment Criteria- Visual Impact

Visual Impact	Significance of visual and landscape impact
Low	The development would cause very minor changes to the existing view over a wide area or minor changes over a limited area, usually with no significant adverse impact on overall visual character. In terms of landscape, minor change, affecting some characteristics and the experience of the landscape to an extent; and introduction of elements that are not uncharacteristic. Development would either not be visible or barely visible, with minor changes in the shape of the overall topographic panorama evident as a result of quarrying- distances of more than 2 km typically apply. Small area only affected, with no significant adverse impact on overall visual character. Typically short term impacts only. Impacts capable of being mitigated or offset by beneficial impacts
Moderate	The development would cause minor changes to the existing view over a wide area or noticeable change over a limited area- quarrying visible. Distances of 1 to 2 km typically apply. Noticeable change to a significant proportion of the landscape, affecting some key characteristics and the experience of the landscape, and introduction of some uncharacteristic elements. Moderate impact on visual character. Impacts typically capable of mitigation in part or whole
High	The changes to the landscape would result in extensive, noticeable change, affecting many key characteristics and the experience of the landscape, and Introduction of many incongruous elements into the landscape. Development would cause a considerable change to the existing view over a wide area or an intensive change over a limited area- typically impacting a visual resource of high visual significance. Quarrying operations highly visible within a direct line of sight from nearby residences and nearby public viewing places, typically within 1km from operations. Visual impacts not capable of being mitigated, with impacts more than likely being more permanent in nature

The assessment combines sensitivity with predicted magnitude of change to establish the significance of residual landscape & visual effects.

The Land and Environment Court has established planning principles relating to various components of visual impact assessment under the EP&A Act 1979. This includes planning principles relating to the assessment of view impacts, as per the judgements contained in *Tenacity Consulting v Warringah* [2004] NSWLEC 140; (2004) 134 LGERA 23 and *Rose Bay Marina Pty Limited v Woollahra Municipal Council and anor [2013]* NSWLEC 1046. These two key Court cases are considered in the following.

The judgement in the Land and Environment Court case *Tenacity Consulting v Warringah* [2004] NSWLEC 140; (2004) 134 LGERA 23. It sets out the planning principle for considering the acceptability of the impact of a proposed development on the views enjoyed from private property in the vicinity of the development. This planning principle was adopted through the collegiate process that has been described on the Court's website for the derivation of such principles. The focus of this Court decision relates to view sharing and the interruption of views caused by a development. In this regard the proposed quarry development does not block views, rather, it changes the view from certain viewing locations. These are considered further in the following.

Equally, the judgement in the Land and Environment Court case *Rose Bay Marina Pty Limited v Woollahra Municipal Council and anor [2013]* NSWLEC 1046 has applicability here. It sets out the planning principle for assessing the acceptability of the impact of private developments on views from the public domain in the vicinity of the development. This also has applicability to the proposed quarry development in that views of the Project Site are possible from a number of viewing points along the Monaro Highway. The framework for this planning principle concerning impacts on views enjoyed from the public domain is broadly consistent with (but not identical to) the matters raised for consideration in *Tenacity*.

The steps that the Court has set down for determining the acceptability of the impact of a development on views are in two stages - the first factual followed by a second, analytical prccess, summarised in the following table.

Table 5.7: View Impact Assessment Steps

Visual Assessment Steps/Considerations	Relevance to Proposed Quarry
Step 1: identify the nature and scope of the existing views, including: ➢ Nature and extent of obstruction of view (by the development). ➢ Elements of the view, important elements within the view. ➢ Whether the change in view is temporary or permanent	The knoll proposed to be affected by the quarry will be gradually lowered- visible from nearest dwelling (Dwelling 1) and from Dwelling 5 (uppermost peak of knoll only). The quarry development will permanently lower the knoll on the ridge, to be replaced by perimeter plantings of pine trees. Discussed further below
Step 2: identify the locations from which the potentially interrupted view is enjoyed	The quarry site is shielded from view from most nearby residences and there are longer range views only of the site from the Monaro Highway to the south and oblique views only from the Monaro Highway near the proposed quarry entry. Discussed further below
Step 3:identify extent of the obstruction at each relevant location	Refer to assessment below. Impacts considered to be acceptable
Step 4:identify the intensity of public use of those locations where that enjoyment will be obscured, in whole or in part, by the proposed private development	No obscuring of views by the quarry- more of a transformation of a view seen by a limited number of rural dwellings or only seen from a distance or oblique view only- considered acceptable. Discussed further below
Step 5: the importance of the view to be assessed	Assessed in more detail in Section 4.5 of the EIS

Other Visual Impact Considerations

There are a number of factors which have been taken into account when preparing this visual assessment. Development is often viewed as permanent and/or perceived to have a negative impact, it is therefore important to emphasise that change created by development can often be beneficial in appearance, and may also be temporary , short-term or indeed reversible. This assessment addresses these aspects; identifying both the type and duration of the potential visual impacts. The following terminology has been used were appropriate and is defined as follows:

Type of Visual Impacts

- Beneficial: A positive impact will improve or enhance the landscape character or viewpoint.
- Neutral: A neutral impact will neither enhance nor detract from the landscape character or viewpoint.
- Adverse: A negative impact will have an adverse effect on the existing landscape character or viewpoint.

Duration of Impacts

- Temporary impacts lasting one year or less.
- Short–term impacts lasting one to seven years.
- Medium-term impacts lasting seven to twenty years.
- Long-term impacts lasting twenty to fifty years.
- Permanent impacts lasting over fifty years.

In summary, the factors considered in assessing potential visual and landscape impacts are as follows:

- **Visual exposure:** The potential for visual exposure of the Project Site from viewing points along public roads and from surrounding rural residences. In this regard, the quarry site is visible only from a few nearby dwellings, with longer range views from the Monaro Highway to the south and glimpses only from the Monaro Highway to the north-east.

- **Magnitude of the visual impact:** Impacts confined to a small area are generally less intrusive in nature than larger areas of disturbance. Related to this, the scale of change in the view with respect to the loss or addition of features in the view and changes in its composition including the proportion of the view occupied by the proposed development is an important factor. In this regard, the quarry footprint is relatively small: 14ha approximately. So too is the degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line, height, colour and texture. The proposed landscaping of the quarry perimeter will assist in this regard.

- **Duration of impact:** The duration of the impact can be very important in determining the significance of impacts. A quarry confined to only a small area with limited visibility from nearby residences has a Low visual impact only. However, it would assume greater visual significance if it were to be permanent and not able to be mitigated- not the case here. A quarry development that is continually changing, including the extent of disturbed areas and restoration activities, will be a significant factor in determining overall visual impacts.

- **Sensitivity of the altered landscape and visual resources:** Refer Section 4.5 of the EIS. The development context and the character, importance, condition and tolerance of the existing landscape to any significant change. [NOTE: The elevated knoll possesses a Medium Visual and Landscape Sensitivity when viewed from Dwelling 1, with a Medium-Low Visual and Landscape Sensitivity from other viewing locations- including from the Monaro Highway.]

- **Beneficial or adverse impacts:** Whether the visual impact is beneficial or adverse.

These factors have been used to categorise visual impacts into varying levels of significance.

The Proposed Quarry & Visual Impact Amelioration Measures

Hard rock extraction results in a temporary change to the landform and geology of an area.

The phasing and progressive restoration of the proposed quarry development aims to minimise the overall impact the proposals exert on the character of the area and the visual amenity of surrounding people.

The small elevated knoll sitting on the top of the ridge is proposed to be removed, however, this will be undertaken with extraction occurring from behind the knoll on the hill, shieldec from view. The resultant visual impact will be one of a progressive lowering in height of the knoll, down to the level of the ridge.

At the same time as the knoll is being progressively lowered, pine trees will be planted out at establishment around the perimeter of the quarry area on its northern, eastern and southern flanks. Within a few years of being planted out, the pine trees will form a distinct 'green edge' to the working quarry area, with trees of about 2m anticipated within about 2 years of establishment- well before any progressive lowering of the knoll will be apparent. By the time that any progressive lowering of the knoll will be apparent- about Year 7-8 or later- the pine trees should have attained a height of about 6m or more. Moreover, the pine trees should become a prominent landscape feature from about Year 2 onwards- a beneficial visual impact.

The pine tree plantings proposed reflect the cultural landscape of the surrounding Monaro Plains- pine tree plantings being commonplace around most homesteads in the region. The pine trees will be retained as a long term, permanent landscape feature, following the completion of quarrying on the quarry site. At completion, the other parts of the Project Site will be landscaped and reshaped to reflect its former landscape character or 'grain'.

The plantings of pine trees should ameliorate the visual impact of quarrying and quarry-related activities on the site. In concert with the establishment of grassed mounding/bunds around the perimeter of the quarry, the pine trees will grow to a height and density which will help to screen more exposed parts of the proposed quarry from surrounding locations, and in so doing, minimise any adverse impact on the the existing landscape character of the site and surrounds.

These measures will significantly reduce potential visual impact to a satisfactory degree.

No stands of trees are proposed to be removed as a part of the proposed development- the site comprising a tree-less, stony grassland landscape- a typical feature of most of the Monaro Plain.

Once quarrying is completed, the Project Site will be restored back to the former landscape, but with additional plantings of pine trees on the hill retained, integrating it with the existing farmland, thus helping to recreate and improve upon its existing landscape character.

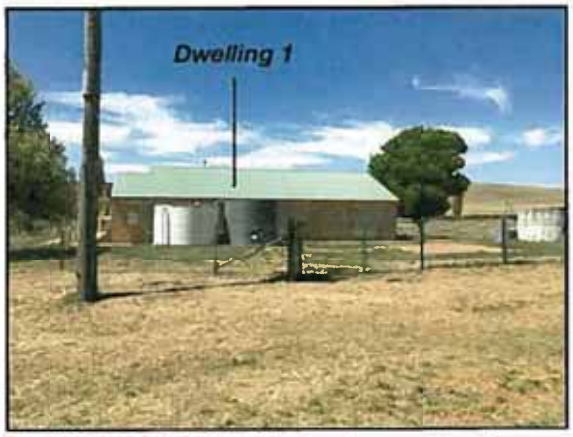
The quarry pit would contain a water body, considered to be a beneficial impact in terms of the longer term use of the site for grazing. This water feature, being below natural ground level, would not be visible from surrounding lands.

Post-quarrying, the increased diversity of the landscape features would enhance local landscape character and overall landscape impact after restoration, and would be beneficial.

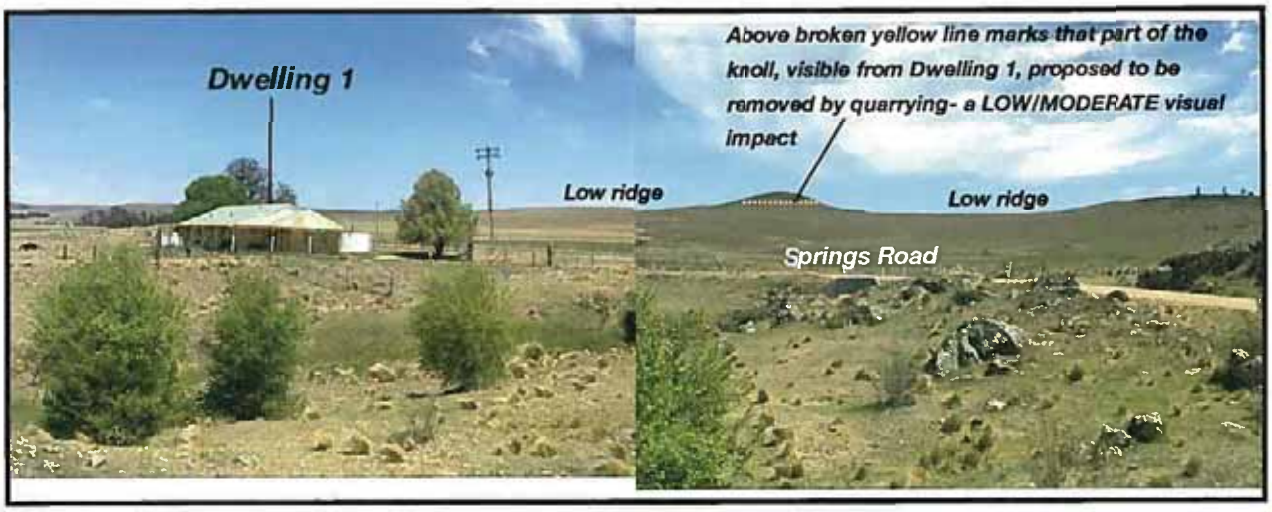
By completion, the established pine tree plantings around the perimeter of the quarry pit, reaching a height of about 20-25m in height, would compensate for the loss of about 35m (maximum) height of the small knoll, removed for quarrying purposes.

Visual Impact of Proposed Quarry from Nearest Residence (Dwelling 1)

The only nearby rural dwelling with good views back towards the proposed quarry site and the small knoll proposed to be removed, is Dwelling 1. This rural dwelling, comprising a single storey rural dwelling at No. 143 Springs Road, is located some 1.69km away from the outer edge of the proposed quarry. The landscape character of the surrounding locality is dominated by the quarry and abandoned mine located either side of Springs Road leading back onto the Monaro Highway, alluvial cropping areas in the lower parts of the valley, with elevated hills and ridges containing grasslands to the north-west. The small, elevated knoll, proposed to be quarried, forms a part of this hill and ridge system. Dwelling 1 has potential views back to the elevated knoll proposed to be quarried- and even these potential views are compromised by the existing screening of the house and placement of water tanks on the western side of the house, facing the ridge system and knoll to the north-west.



PHOTOGRAPH: View of west-facing facade of Dwelling 1, facing the proposed quarry Views of quarry site obscured by shades and tanks. *(October 2017 photography)*



PHOTOGRAPH: View of north and east-facing facades of Dwelling 1 with Springs Road. Views only possible of most elevated (approx. top 60% of height) of the knoll to be quarried, with lower parts of the knoll obscured by intervening topography. Approx. 35m is proposed to be removed from the existing height of the knoll ie. between RL 1035m and RL 1000m, however, the lower sections of the knoll are not visible from this dwelling. The perimeter at the base of the quarry is to be planted out with a belt of pine trees reaching 20m-25m in height at maturity *(October 2017 photography)*

The elevated knoll possesses a Medium Visual and Landscape Sensitivity when viewed from Dwelling 1. Views from the dwelling are predominantly to the east, away from the ridge system to the north-west. Because of the base of the knoll is obscured by intervening topography, the pine tree plantings will only come into view beyond about Year 5-6 when the pine trees reach a height of in excess of 6-8m. Prior to that time, the pine trees, to be planted out at the base of the knoll, should be obscured by the intervening topography.

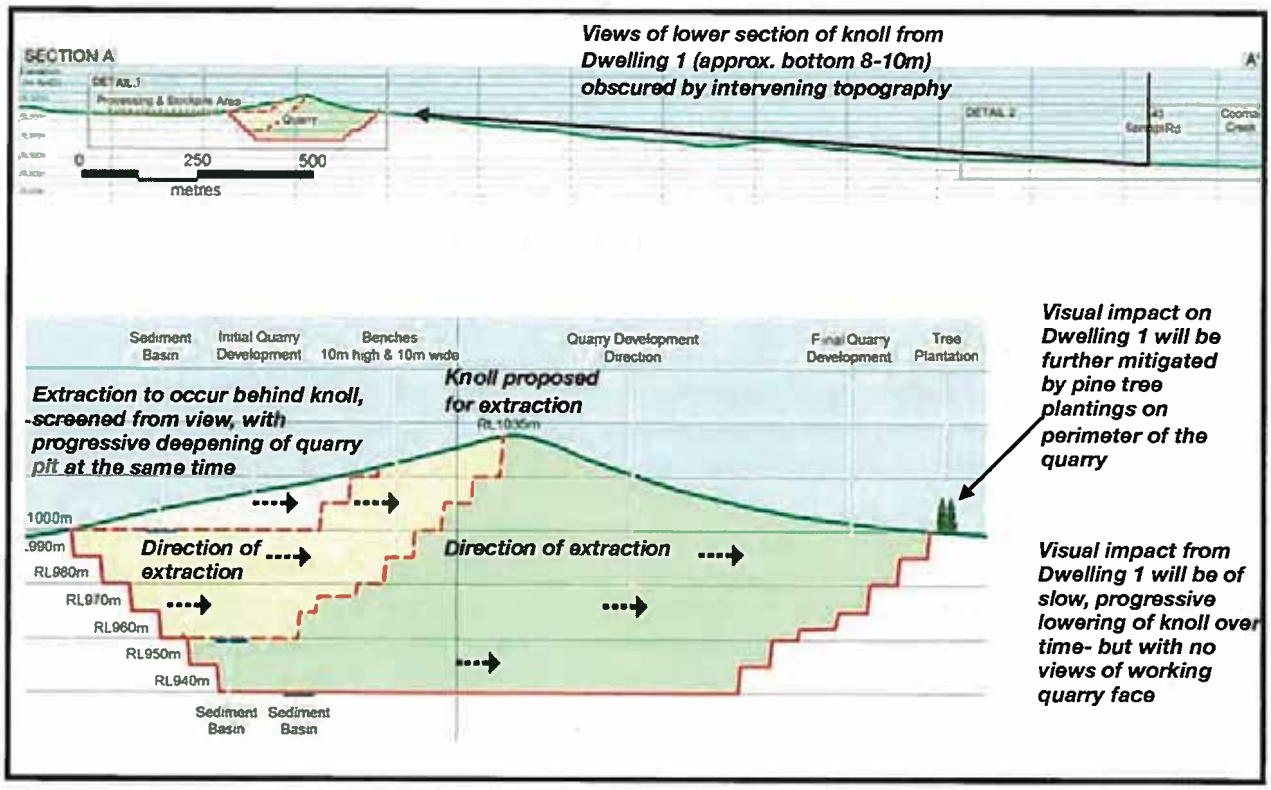


FIGURE 5.9: Visual impacts of proposed quarry from Dwelling 1

(Base Map Source: Tanand based on survey of the site and surrounds)

Dwelling 1 is located within 2km from the proposed quarry site, considered to be close enough to allow identification of significant detail, if exposed to view. Any positions within this range with open uninterrupted views of a development would generally receive the greatest visual impacts. However, the visual impacts of the quarry from Dwelling 1 are tempered by the following:

- The visual quality of the land in the vicinity of Dwelling 1 is diminished by virtue of the proximity of this dwelling to adjacent quarry operation and abandoned old mine on Springs Road near the intersection with the Monaro Highway. This makes the land near these uses tolerant of change without detriment to their present character.

- Views are not uninterrupted. Views are possible only of the top 60% of the knoll to be quarried, reducing the magnitude of any visual impact.

- The dwelling is generally oriented to the east, away from the knoll. Views to the west are compromised by the existing screening of the house and placement of water tanks on the western side of the house, facing the knoll.

- In the early stages of the quarry, extraction will commence at the rear of the knoll, advancing towards the south-east hidden by the knoll. Approximately one third the way into quarrying the knoll extraction will reach the peak of the knoll (RL 1035m), and extraction will then continue to move in a SE direction, always hidden behind a topographic barrier. Once extraction reaches the peak of the knoll, the visual effect thereafter will be that of a gradual lowering in the height of a minor landscape feature (ie. the small knoll) over time. At no time will the quarry extraction face be in view from Dwelling 1. Perimeter tree plantings and a part of the vegetated mounding on the southern side of the quarry infrastructure area should become visible over time when viewed from this dwelling, however, at no time will these works become a visually prominent feature when viewed from Dwelling 1. Views of plantings will have a net beneficial impact that will become more pronounced over time and will compensate for the loss in height of the knoll.

- No views will be possible from Dwelling 1 of the proposed internal quarry haul route.

- Medium/long-term impacts likely.

Refer Figure 2.3 showing section between Dwelling 1 and the proposed quarry. Based on the above assessment it is concluded that the proposed quarry will have acceptable visual impacts on the dwelling nearest to the proposed quarry (Dwelling 1).

The visual impact of the proposed quarry development on Dwelling 1 is thus assessed as being Low- Moderate.

Visual Impact of Proposed Quarry from Dwelling 5, Located Approx. 2.7km away

This dwelling is located more than 2km from the proposed quarry site. Refer also to viewpoints E and F in Section 4.5 of the EIS.

At this distance, the visibility of the land containing the quarry development site becomes more general, with viewers in open uninterrupted positions able to identify general form, colour/tone and textural contrast, but losing the more focused detail achievable from closer positions. Effects at this distance are generally less than those found between 0-2km.

Views of the peak of the knoll only are possible from *Dwelling 5*, but not of lower elevations on the knoll, resulting in a Low landscape and visual sensitivity from this location. With the exception of the loss of view of this peak from this more distant location there should be no other landscape impacts resulting. At no time will the quarry extraction face be in view from Dwelling 5.

Based on the above, the visual impact of the proposed quarry development on Dwelling 5 is assessed as being Low.

Visual Impact of Proposed Quarry from Springs Road Dwellings 3, 4 and 6

No views are possible of the knoll proposed for extraction from other nearby dwellings- refer section 4.5 of the EIS for details. Oblique views of the knoll are possible from sections of Springs Road.

The landscape character of the eastern section of Springs Road- where all of the next nearest dwellings are located (Dwelling 3, 4 and 6)- is affected by the existing abandoned mine to the south side of Springs Road, and the quarry, located on the north side of Springs Road. Both operations have left exposed highly disturbed landscapes with no rehabilitation evident.

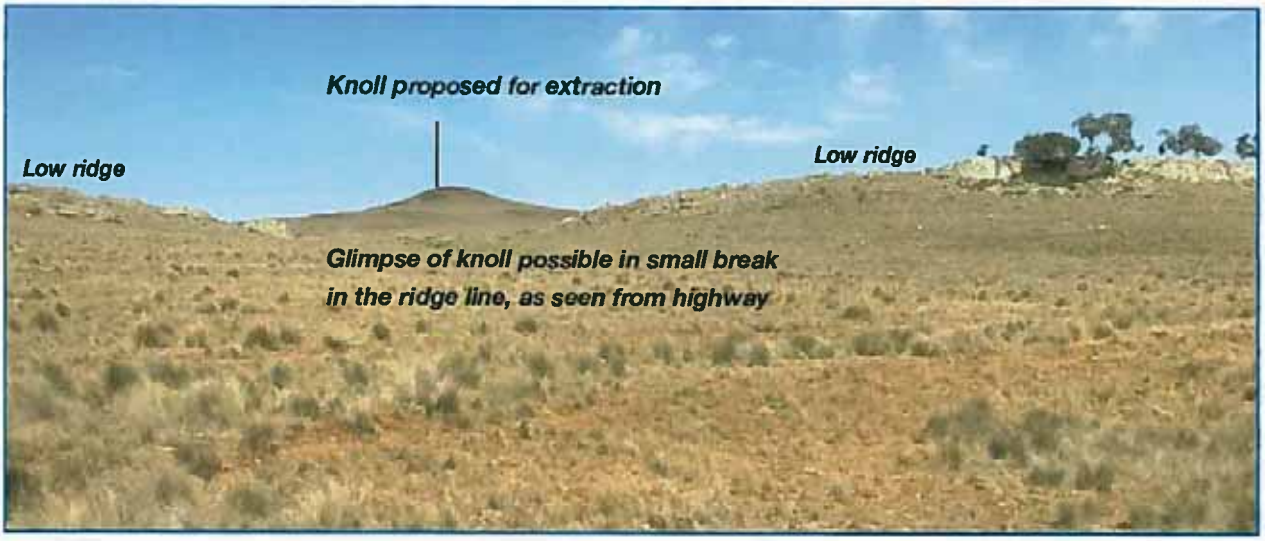
PHOTOGRAPH: The landscape of the eastern section of Springs Road is affected by disturbed terrain in and around an existing quarry, located on the northern side of the road near the Monaro highway intersection *(October 2017 photography)*

PHOTOGRAPH: The landscape of the eastern section of Springs Road is affected by disturbed terrain in and around an abandoned mine site, located on the southern side of the road near the Monaro highway intersection *(October 2017 photography)*

The visual impact of the proposed quarry development from the above locations is assessed as being negligible to Low.

Visual Impact of Proposed Quarry from Monaro Highway to North/East

Glimpses only are possible of the quarry as far as from 5km away on the Monaro Highway. Closer still, oblique views of the quarry are possible from about 1.9km to 2.0km away. Any viewing point within 2km from a development is considered to be close enough to allow identification of significant detail, if exposed to view, however, the potential for impact is diminished significantly if the views are either glimpses only or oblique views- which is the case here. From the highway at its nearest point, approximately 1.9km from the quarry site the view that is available provides but a fleeting glimpse- views of the knoll shielded by a low ridge that runs parallel to the highway. This glimpse provides the only uninterrupted view of the quarry development site. Moreover, it is an oblique view only. Refer to accompanying photograph, below.



PHOTOGRAPH: View from the east looking towards the knoll proposed for extraction. From the highway to the east approx. 1.9km away a glimpse only of the knoll is to be obtained (oblique view only), with views elsewhere on the highway nearby shielded by the low ridge that runs parallel to the highway. The proposed internal haul route is to run through the gap in this low ridge. *(October 2017 photography)*

Views of small sections of the quarry haul road may be possible nearer the highway, however, as the use is one that is close to the ground, and obscured in part by the low ridge the visual impact would be negligible to Low. Closer to the knoll, the rising haul route would be visible- but only a line running diagonally along the side of the hill in the distance leading up to the knoll (right hand side of photograph).

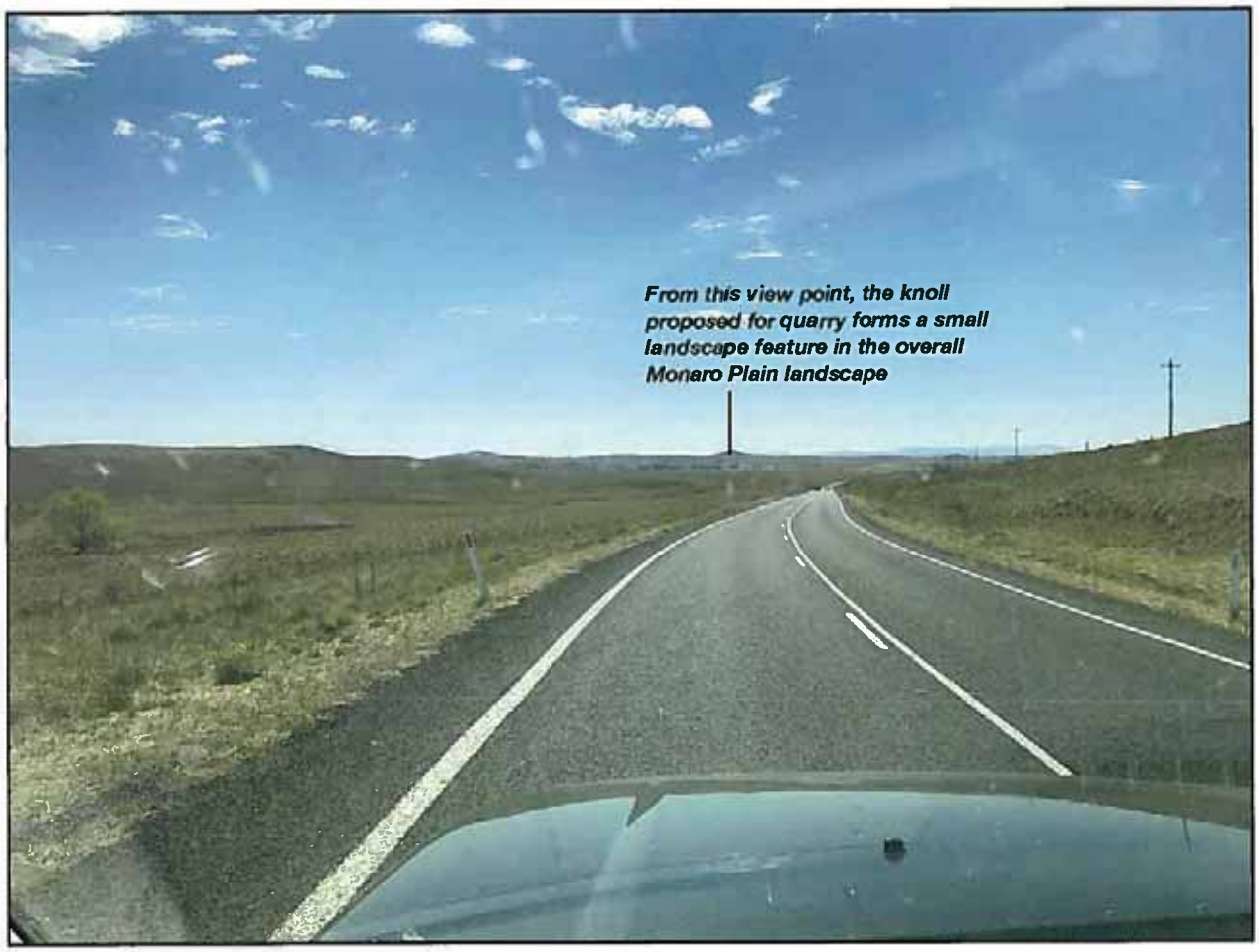
The landscape here would possess a Medium to Medium-Low landscape sensitivity, a Medium-Low visual sensitivity and a Medium-Low scenic quality. At a distance of 2km or more the visibility of a development site becomes more general, with viewers in open uninterrupted positions able to identify general form, colour/tone and textural contrast, but losing the more focused detail achievable from closer positions. In the case of the proposed development site, with glimpses only possible of the knoll, its landscape and visual sensitivity is further diminished. Visual impacts at a distance of 2km or more are generally less than those found between 0-2km.The visual impact of the proposed quarry development, including haul route, from the above locations is assessed as being Low-Moderate. Refer also to viewpoints D and E in Section 4.5 of the EIS.

Visual Impact of Proposed Quarry from Monaro Highway to South

As a basic visual assessment principal, any type of development in the landscape will become less perceptible the greater the distance that the viewer is removed from the development. In other words, this equates to a reduction in the significance of potential visual impacts as one moves further away any development.

Interrupted, longer distance views of the knoll are available from a distance of about 10km to the south along the Monaro Highway. These views are completely blocked by topographic barriers within about 3km of the knoll. The landscape here possesses a Medium landscape and visual sensitivity. This assessment is tempered by the fact that beyond 5km the visual prominence of a development site quickly diminishes. In such situations, any development increasingly becomes part of the general background/distance views. At a distance of between 2-5km, visibility of a development site becomes more general, with viewers in open uninterrupted positions able to identify general form, colour/tone and textural contrast, but losing the more focused detail achievable from closer positions of 2km or less.

The landscape viewed from the highway here would possess a Moderate Scenic Quality, namely, being a landscape that includes landform or land cover which tend to be common throughout the region, lacking in outstanding, unusual, distinctive or diverse character. Refer also to viewpoints F in Section 4.5 of the EIS.



PHOTOGRAPH: View from Monaro Highway approx. 10km to the south looking towards the knoll proposed for extraction. The knoll appears a small feature in the overall landscape of the Monaro Plain and has minimal visual significance.The quarry will have a perimeter belt of pine trees planted around it to reduce visual impacts. *(Oct 2017photography)*

The visual impact of the proposed quarry development from the above locations is assessed as being negligible (where obscured from view) to Low (where visible from distances of greater than 2km) to Low-Moderate (where closer views are possible of the knoll, including oblique views within 1.9km of the quarry site).

Summary: Assessed Visual Impact

When establishing the extent of site visibility and identifying key visual receptors, the highest point (ie. peak) of the knoll within the proposed development was visited initially. The purpose of this is to establish what may be visible from this location and therefore determine from which points in the wider landscape the site may be visible. This assessment, contained in Section 4.5 of the EIS, finds that areas with any views of the knoll proposed for extraction is reasonably confined, primarily effecting only two dwellings in relatively close proximity to the development site- Dwellings 1 and 5. Neither dwelling has uninterrupted views of the entire knoll, with views from Dwelling 5 confined to only the peak of the knoll. Beyond these adjacent positions, the visibility of the knoll is considered patchy with a small number of locations to the east within 2km and all remaining opportunities beyond that distance on higher lands to the north-east and south. The visual assessment has focused primarily on positions within 2km of the proposed quarry development as this is the viewing range most likely to have the potential to experience significant visual effect. These viewpoints are therefore representative of 'worst case scenario' views of the proposed quarry development. As viewers move further from the site, visual impacts diminish.

By their very nature, quarry developments tend to result in permanent changes to and can fundamentally alter the appearance of a landscape. However, it should be clarified that, altered appearance does not necessarily equate to permanent negative impacts to landscape character. In this regard the medium term the proposed quarry development intends to remove a small knoll, approximately 35m high, from the top of a low ridge on the Project Site.

The quarry operations are to be phased, with advanced boundary earthworks and perimeter tree planting introduced from the outset. In this regard a pine tree belt is to be established at quarry commencement around the southern, eastern and northern perimeters of the quarry site. As the proposed quarry operations would take some years to complete, the boundary plantings would be well established by the time the lowering of the knoll will occur: a net beneficial visual impact. In the near vicinity (ie. within 2km of the quarry site) the removal of this knoll will only be visible in part from Dwelling 1 and only the top section from Dwelling 5, with an oblique glimpse available from the Monaro Highway to the east. With construction of the earth berms and establishment of screen planting, residual visual effects would be limited from the majority of directions. These plantings and works will be visible, in part only, from Dwelling 1.

In terms of magnitude of change over the entire life of the proposals (including restoration) it has been considered that there would be generally Low change, with the quarry well shielded from most nearby dwellings, with most impacts more localised in nature. In summary:

- The magnitude of the visual impact on Dwelling 1 is Low-Moderate. For much of the early phases of the quarry there will be little apparent change to the nature of the landscape in and around the proposed quarry. From about one third the way through the quarrying of the knoll there will be a progressive lowering of the height of the knoll, however, there will be no views of the working quarry face. During this time the perimeter plantings of pine trees- pine trees being a common landscape element in this locality- will become apparent: a net beneficial visual impact.

- The magnitude of the visual impact on other nearby residences is assessed as negligible to Low.

- The proposed quarry site is not located within a landscape area that includes any statutory designations for landscape character, value or quality. Chapter 6.11 of the DCP identifies certain areas within the LGA considered to be of outstanding landscape value which should be protected from development that will

negatively impact upon it. This part of the DCP identifies important vistas and landscapes. The Project Site lies well to the north of and outside of the Peak Road Landscape Area- the nearest designated landscape of high landscape value to the Project Site. The quarry haul route lies within 40m of the Monaro Highway and is within a designated Scenic Protection Area as identified in the LEP, however, the impact of the haul route should result in Low visual impacts, and no specific mitigation measures are required to ameliorate any potential visual impacts associated with the haul route within this corridor of land. [NOTE:The introduction of modest plantings of shrubs along the haul route near the Monaro Highway, if deemed necessary, would however improve the visual appearance of the haul route when viewed from this transport route.]

- The Project Site has a Medium- Low sensitivity to change. It is only directly visible from the nearest Dwelling 1 (middle to upper parts only) and Dwelling 5 (peak only of the knoll). With quarrying an altered landscape will not be apparent from other nearby dwellings, with longer distance views only from the highway to the south and oblique views where the highway abuts the Project Site.

- The (below ground) quarry pit will not be visible from nearby residences or viewing locations. Importantly, the quarry infrastructure area will be restored back to native tussock grassland upon completion of quarrying-related activities on the site. agricultural use, integrating it with the existing undeveloped rural grazing land surrounding it, thus helping to recreate its previous landscape character.

- As a result of quarrying some agricultural land would be lost, however, the land lost (ie. the knoll) is stony land not suited to agriculture. The other disturbed areas of the quarry working area will be restored and water bodies will be provided, both within the quarry pit and within the quarry infrastructure area. These water sources will become important water supplies for future rural use (longer term) and for the rehabilitation and re-establishment of native tussock grasslands back to the site (in the short term). In landscape terms, the loss of features is not particularly significant as upon restoration these would be significantly compensated for by the restoration proposals including new water bodies, new plantings of native tussock grasses, and areas of pine tree plantings around the perimeter of the worked quarry. In particular, the pine tree plantings will enhance local landscape character and overall landscape impact during the running of the quarry operation as well as post-quarry phases, and would be slightly beneficial.

- Related to the above, mitigation measures have been developed as an integral part of the design process and of the quarry development proposal. The proposals aim to assimilate the development into the existing landscape fabric, minimising any potential adverse landscape and visual impacts. A full description of mitigation measures can be found in the main body of the Environmental Impact Statement.

- The proposed quarry development will have a Low-Moderate visual impact from Dwelling 1 and from those sections of the highway to the south and to the east with views into the site, and a generally negligible-Low visual impact from other viewing locations- all impacts considered to be acceptable measured against all relevant visual assessment criteria. Potential impacts on night-time scenic quality are not considered to be significant due to the hours of operation of the proposed quarry (day time only) and need for minimal security lighting only at night.

5.3.14 Social and Economic Impacts

Economic Impacts

The project is necessary so that Schmidt Quarries can relocate to a new quarry after the planned closure of Nimmitabel Quarry, expected to occur by late 2018. Given the lead times that are involved (in gaining development and environmental approvals; establishing the operation and completing preliminary site works in order to enable full scale production), it has been necessary for Schmidt Quarries to commence the relevant approval processes to ensure that an adequate, uninterrupted and efficient supply of construction materials remains available for critical infrastructure and construction projects in the existing market area. Maintaining the current skilled quarry workforce will also be critical.

Quarries need to be close to markets to support building and infrastructure; processed quarry stone being an essential component used in the construction of airports, industrial developments, roads, railways, homes, schools, hospitals and shopping centres. In this regard the proposed development will have direct access to the Monaro Highway and markets in the neighbouring regions. For example, quarry materials make up about 80% of concrete and more than 90% of roads in Australia.

As such, quarries underpin the country's ongoing development and maintenance of essential infrastructure, and play a vital role in Australia's economy.

> *"Australian quarries support our vital building and construction industries which generate over $160 billion in revenue each year and directly employ more than one million Australians. The building and construction industry demands more than 150 million tonnes of construction aggregates each year to meet the need for our homes, workplaces, public buildings and roads.As well as providing these essential materials, quarries stimulate local communities through investment and by providing jobs. In fact, the quarry industry creates over 10,000 jobs directly and supports another 80,000 indirectly, often in rural and regional locations."* (source: Cement Concrete & Aggregates Australia website January 2018).

The proposed quarry will provide additional reserves for the continued use of high quality basalt resources for local and regional markets, including major infrastructure projects in the region. The quarry expansion will support long term economic prosperity in the locality by optimising the use of land and resources at an already approved quarry site. The proposed quarry expansion is an economic opportunity which does not conflict with recreation or tourism or agriculture or rural amenity or environmental values. The quarry operations are in a location with suitable setbacks and buffers to prevent adverse effects.

The proposed development will operate as a quarry for the extraction and processing of hard rock for use in a wide of uses including but not limited to concrete, asphalt, drainage materials, and road base. Investigations indicate that the quality and consistency of the resource at the site is of equal quality than the hard deposit situated at Schmidt Quarries' existing Nimmitabel Quarry- also a volcanic plug- providing an opportunity to completely replace these current quarry operations due to the fast-diminishing supply of (Council) approved resources at that site.

The proposed new quarry has the potential to supply the existing market region with high grade extractive materials for up to 30 years whilst maintaining continuity of employment across Schmidt Quarries' integrated quarrying, asphalt, concrete and transport operations. The 'green fields' quarry site will be fully developed and operated in accordance with recognised quarry industry 'best practice'.

The existing Nimmitabel quarry operation is a modest sized- although regionally important- quarry. Its operation results in the employment of on-site staff, plant and haulage operators, staff hauling quarry product, earthmoving contractors, and (when required) blasting contractors. At this quarry Schmidt Quarries currently provides full-time employment for 5 persons and part-time employment for 3 persons, with 4 full-time truck drivers of its own-almost all of which all are employed locally. This excludes persons employed by the blasting contractor. Assuming gross salaries and wages across the 12 employees above would be of the order of $1.3 million, with approximately almost 100% of this income likely to be spent locally.

This workforce will increase for any larger project, as demand warrants. In addition to these personnel, contractors will be hired to carry out maintenance on equipment and other tasks, including the loading and carting of products from the excavated area. Using an employment multiplier of 2.0, the quarry is likely to create up to an additional 24 jobs off-site, with most of these likely to occur in the Snowy Monaro region.

At an average production of 150,00 tonnes per annum the Project would provide major economic benefits in the form of annual operating income of up to $2.4 million, increasing to approximately $4.5 million including truck haulage of quarry product. This includes expenditure on fuel, repairs and maintenance, salaries and wages, payment of State and Commonwealth taxes and fees.

Gross wages and salaries is likely to be in the region of $0.6 million for on site employees, and $0.7 million for the company's truck drivers: a total of $1.3 million in wages and salaries. The estimated average gross income from quarry sales is likely to be up to approximately $4.48 million per annum at a maximum production of 280,000 tonnes per annum, and approximately $8.4 million including truck haulage.This excludes expenditure on fuel, repairs and maintenance, power, council rates, and environmental monitoring. It includes salaries and wages and operating costs not included in the above. Much of the operating expenditure is likely to occur within the local area and is likely to produce additional indirect effects to other local industries.

The estimated annual operating income for the project at a maximum production of 280,000 tonnes per annum is likely to be approximately $4.48 million, and approximately $8.4 million including truck haulage. This excludes expenditure on fuel, repairs and maintenance, power, council rates, and environmental monitoring. It includes salaries and wages and operating costs not included in the above. Much of the operating expenditure is likely to occur within the local area and is likely to produce additional indirect effects to other local industries.

If an output multiplier of 1.5 is used, this indicates that the economic output of all other industries within NSW would increase by approximately:

- $6.75 million as a consecuence of the consumption of $4.5 million in quarry products (at an average of 150,000 tonnes per annum).
- $12.6 million as a consequence of the consumption of $8.4 million in quarry products (at maximum production of 280,000 tonnes per annum).

The proposed development will enable a continuation of revenues for the public sector by way of taxes, duties and excise and through payments for various government services. The State Government receives revenue from vehicle and quarry registrations, road and fuel tax.

The quarry operator, Schmidt Quarries, has a proven track record in responsible quarry management. Their existing quarry, at Nimmitabel, is to shut down soon.

Schmidt Quarries seek to relocate their quarry operations to the Project Site, applying similar, proven and reliable quarry and environmental management measures to those currently applied at the Nimmitabel Quarry.

The proposed quarry will provide new reserves for Schmidt Quarries, who is an established quarry operator who has served the region for many decades. The new quarry is an economic opportunity which does not conflict with recreation or tourism or agriculture or rural amenity or environmental values. The quarry operations are in a location with suitable setbacks and buffers from neighbours to prevent any significant adverse effects.

The proposal would also have economic benefits via the provision of ongoing direct and indirect employment and contributions to the provision of much-needed quarry products to local industry and to the improvement of the local road infrastructure, including land subdivisions.

Social Impacts

No unacceptable amenity, noise, traffic safety dust or associated impacts are expected to the use and enjoyment of adjacent rural owners. The technical studies demonstrate that the new quarry will meet all relevant standards for noise, overpressure, blasting, environmental, and traffic impacts and will not unduly or unreasonably interfere with

neighbouring residences and rural amenity generally. The new quarry will be compatible with adjacent land uses. Monitoring and mitigation measures are prescribed and implemented to ensure ongoing compatibility.

The topography of the Project Site and separation from neighbouring rural uses assists in maintaining the rural character of the locality at Rock Flat at the same time as allowing the intended economic development of the volcanic hard rock resource.

Approval of the new quarry will ensure that the workforce currently engaged at the Nimmitabel Quarry, numbering between 5-6 employees, can transfer to the Project Site once the new quarry is approved. Approving the new quarry would provide long-term security to this established, skilled quarry workforce, as well as employment for truck drivers, many of whom reside locally. The investment in the new quarry would provide additional employment and stimulus to local services and facilities, including retail industries within the Snowy Monaro region. The quarry management and mitigation measures outlined will aim to minimise and mitigate impacts to an acceptable degree, and will minimise social impacts generally.

5.3.15 Greenhouse Gas Emissions

The Project Site is set back from neighbouring residences. the nearest residence being 1.69km away (Dwelling 1), thereby reducing the potential for air-borne contaminants from reaching any residence. In general, increasing the distance between the receptor and the source will mitigate odour impacts. This objective is achieved in the case of the Project. Types of land uses that typically pose potential odour problems include intensive agriculture, wastewater treatment plants, food processing facilities, chemical plants, landfills, transfer stations and dairies. The project does not include any of these land uses or similar land uses.

Diesel truck emissions could also be an odour source. However, since trucks do not pass by any of the nearest receptors along the local council road system- the project providing direct access to the highway- the exhaust emissions and associated odours associated with idling of engines does not arise. Therefore, the project would be most unlikely to create objectionable odours that would affect people, and odour impacts are expected to be less than significant.

Greenhouse gases are generated by the following quarry activities:

- Combustion of fuels by mobile plant, equipment and onsite vehicles.
- Electrical power usage by office, pumps etc.
- Use of explosives for rock blasting.
- Transport to markets.

At an average production of 150,000 tonnes per annum it is estimated that an average of approximately 114kL of diesel would be consumed annually by quarry generators and approximately 98kL for mobile plant, generating 573 tonnes of carbon dioxide equivalents($C0_2$-e). This would increase to 212kL and 182kL respectively at a maximum production of 280,000 tonnes per annum, generating 1,071 tonnes of carbon dioxide equivalents ($C0_2$-e).[NOTE: With technological improvements with equipment these rates of usage are expected to be reduced over time- in particular if power is connected or solar power utilised in the future]

Compared against the June 2017 annual estimate for national Australian greenhouse emissions of 550,200,000 tonnes ($C0_2$-e) the annual contribution from the proposed quarry development is tiny- between 0.00000104% (@a production of 150,000 tonnes per annum) and 0.00000195% (@ a production of 280,000 tonnes per annum). [Source of Australian greenhouse gas emissions: Department of Environment and Energy Quarterly Update of Australia's National Greenhouse Gas Inventory: June 2017-website]

The Project Site is highly accessible to the Monaro Highway and thence to markets to the north, east and to the south. The nearness of a new quarry resource to a major transport route has implications for greenhouse emissions, as explained in the following:

> *"Local geology determines where the resources are located in the earth. Quarries must be located where these materials are and where existing transport infrastructure, principally roads, are available to get the materials to market. It's also about efficiency, safety and the environment. The closer a quarry is to its markets, the cheaper the cost of supplying the materials. This flows through to the cost of constructing homes, driveways, paving, roads and all other facilities our communities rely on.*
>
> *Because the trucks delivering these materials have fewer kilometres to travel, there are fewer trucks needed, less wear and tear and congestion on our roads, reduced risk of accidents and less CO2 emissions."* (source: Cement Concrete & Aggregates Australia website January 2018)

With the exception of an increase in greenhouse gas emissions, the residual risk associated with potential air quality impacts is assessed to be low. The air quality assessment by Vipac shows that compliance with all relevant air quality criteria can be achieved.

5.3.15 Ecological Impact Assessment

Overview

Gunninah was engaged by Outline Planning Consultants Pty Ltd on behalf of Schmidt Quarries to assess the likely impacts on flora and fauna of the proposed new hard rock quarry. Refer also to **Appendix L.**

The flora and fauna assessment of the proposal concludes that on the basis of the impact amelioration measures which have been incorporated into quarry project, the project is not likely that a "*significant impact*".

Nevertheless, for the purpose of 'abundant caution', a '*Referral*' of the Rock Flat Quarry project proposal has been made to the Commonwealth pursuant to the (Commonwealth) *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act).

Statutory Regime (NSW)

The *Environmental Planning & Assessment Act 1979* (EP&A Act) includes a requirement to determine "*whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats*". The relevant factors contained in Section 5A of the EP&A Act "*must be taken into account*" by a consent or determining authority when considering a Development Application, and, relevantly, in administering Sections 111 and 112 of the EP&A Act.

In addition to the seven factors that "*must be taken into account*" (where relevant) pursuant to Section 5A(2) of the EP&A Act, Section 5A(1)(b) of the EP&A Act requires that "*any* [relevant] *assessment guidelines*" promulgated by the relevant authorities (particularly in this instance the OEH) also "*must be taken into account in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats*".

In considering the relevant factors of Section 5A of the EP&A Act, it is relevant and appropriate to take into account the nature and condition of the land to be affected, and its context – in considering what threatened biota may be present, what their use of the site might be, and what might be the effect on any such biota of undertaking the proposed development.

Threatened Biota (NSW)

Threatened biota listed in the *Threatened Species Conservation Act 1995* (TSC Act) that are of real or potential relevance to the proposed activities on the subject land are principally the threatened reptiles recorded, and to a lesser extent a few aerial species.

- The Striped Legless Lizard *Delma impar* and Grassland Earless Dragon *Tympanocryptis pinguiciolla* (recorded in tussock grassland; but outside the project footprint).

- Two threatened microchiropteran bats - the Large-footed Myotis *Myotis macropus* and the Eastern Bent-wing Bat *Miniopterus orianae oceansensis* (recorded along the wooded ridge line outside the quarry project footprint and beyond the project site).

- Possible wide-ranging avian raptors – the Spotted Harrier, Little Eagle, Black Falcon and Square-tailed Kite.

Except for the two reptiles, all of these and any potential additional species would not be dependent on the tussock grassland and/or Melicytus shrub land habitats and resources for their survival in the locality. On even an individual basis. There are no resources or habitat features present on the subject site or in its immediate vicinity that could conceivably be of any significance for even an individual of any of the known or potential microchiropteran bats or avian raptors. Indeed, the final rehabilitated quarry has the potential to provide a substantial area of suitable habitat and resources for such species in the future. There is no 'Threatened Ecological Community' (TEC) within the subject site or in its immediate vicinity. Even if the woodland on the low ridge line in the eastern part of the subject land does constitute an example of the Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland EEC, none of this vegetation will be affected by the proposed quarry operations in any way.

Section 5A Factors for Consideration (NSW)

A comprehensive set of *Assessments of Significance* pursuant to Section 5A of the EP&A Act has been prepared for the two reptiles relevance to the proposed quarry project at Rock Flat. Refer also to **Figure 4.14** and **Figure 4.15**. Further consideration of the seven factors of Section 5A for other threatened species that could potentially occur, or which have been recorded but do not rely on the resources within the project footprint, is provided below.

- There is no likelihood that a "*viable local population*" of any of the additional threatened species that could potentially occur in the vicinity of the subject site would be placed "*at risk of* ***extinction***" (e mphasis added) as a consequence of the proposed quarry development Factor (a). For most such species, the project footprint contains no habitat or resources of relevance at all; whilst for others (*eg* the raptors) the grassland present represents only a minute fraction of that in the locality and region. Gunninah conclude that "*It is not possible for even an individual of any such species to be reliant upon the subject site.*"

- There is no "*endangered population*" of any relevance, or even potential relevance, to the proposed quarry project at Rock Flat - Factor (b).

- The only "*threatened ecological community*" (TEC) in the vicinity of the proposed quarry development at Rock Flat is the Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland Endangered Ecological Community(EEC) – which may be represented by the low open woodland on the small ridge line in the eastern part of the subject land. However, the quarry project will have no impact whatsoever on the vegetation along the ridge line; and there is no potential for the proposal to impose a "*significant effect*" (nor indeed any "*effect*") on this EEC, even if it is present - Factor (c).

- With respect to Factor (d) of section 5A of the EP&A Act, the following considerations apply:

  Only an extremely small area of potential habitat for any additional threatened biota will be "*removed or modified*" for the proposed quarry, relative to the very substantial areas of such habitats and resources available in the vicinity and locality – Factor (d)(i).

No habitat for any threatened biota will become "*fragmented or isolated*" by the proposed quarry development, given the very small footprint of the project in the surrounding landscape and the mobility of the potentially relevant threatened biota – Factor (d)(i).

None of the habitat or resources for any threatened biota that would be affected by the proposed development would be "*important for the survival*" of any of the relevant or potentially relevant biota "*in the locality*" – Factor (d)(i).

- There is no "*critical habitat*" for any threatened biota present in the location of the proposed quarry development at Rock Flat - Factor (e).

- The proposed quarry development at Rock Flat would not contravene the goals or desired outcomes of any *Recovery Plans* or *Threat Abatement Plans* for any threatened biota present or likely to occur - Factor (f). The project will not prevent the implementation of or contradict any of the objectives of the *National Recovery Plan for the Striped Legless lizard*.

- The proposed quarry development at Rock Flat will involve the imposition of two "*key threatened processes*" (KTPs) – "*the clearing of native vegetation*" and "*bush rock removal*". The latter of these KTPs specifically identifies the Striped Legless Lizard and Grassland Earless Dragon as species affected by the KTP. The proposed quarry project will involve the removal of only an extremely small area of tussock grassland and Melicytus shrub land by reference to the extent of these vegetation types in the locality and region. Further, the areas to be affected by the project do not support populations of any threatened biota.

The project will involve the removal of bush rock from some areas during site clearing activities. However, bush rock is to be stockpiled for re-use during site rehabilitation activities (noting that there will be no shortage of rock at the completion of the quarrying activities). The proposed quarry development at Rock Flat could potentially involve the imposition of the KTP "*invasion of native plant communities by exotic perennial grasses*". However, the project includes measures (to be documented in the VMP for the quarry) to ensure that no such grasses are introduced onto the site- refer Section 2.3.13 of the EIS for further details.

It is not likely that the proposed quarry development at Rock Flat would result in the imposition of or exacerbation of any "*key threatened processes*" such that a "*significant effect*" would be imposed on any threatened biota or their habitats - Factor (g).[NOTE: the term "significant" qualifying the verb "affect" means "important", "notable", "weighty" or "more than ordinary" (*Newcastle & Hunter Valley Speleological Society Inc v Upper Hunter Shire Council and Stoneco Pty Limited* [2010] NSWLEC 48 at [84] and the cases cited thereat)].

In regard to the above Section 5A considerations, Gunninah conclude as follows:

"The following matters are of relevance in considering the potential for a "significant effect" to be imposed upon any threatened biota or their habitats as a consequence of the proposed quarry at Rock Flat.

- *Only an extremely small area of vegetation is to be affected by the proposed activities – relative to the extent of those vegetation types in the immediate vicinity and locality.*
- *No hollow-bearing trees or other such habitat features of significance are to be affected by the proposal.*
- *The proposed quarry project at Rock Flat has incorporated measures to avoid disturbance to habitat for threatened biota (by relocating the access/haul road) and to protect other habitats and resources in the vicinity (by the management of stormwater and other discharges).*
- *The proposal also includes measures to protect individual fauna (pre-clearing surveys and relocation where necessary) and to rehabilitate and supplement habitat for the threatened reptiles within the subject land (see Chapter XX).*

It is not "likely" that the proposed quarry at Rock Flat and/or its ancillary activities would impose a "significant effect" on any "threatened species, populations or ecological communities, or their habitats" - pursuant to the relevant considerations in Section 5A of the EP&A Act."

[NOTE: The word "likely" with respect to "significant affect" means a "real chance or possibility" *(Newcastle & Hunter Valley Speleological Society Inc v Upper Hunter Shire Council and Stoneco Pty Limited* [2010] NSWLEC 48 at [84] and the cases cited thereat). The description of development the subject of a development application is not restricted to the nature, extent and other features of the development, but can also include measures that ameliorate or mitigate, prevent, remedy or offset the impacts of the development *(Newcastle & Hunter Valley Speleological Society* at [82])]

Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act)

The *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) requires consideration of the potential for a "significant impact" to be imposed by an activity on a Matter of National Environmental Significance (MNES). In the event that such an "*impact*" is "*likely*" to be imposed, the proposed activity must be referred to the Commonwealth for determination as to whether it constitutes a "*controlled action*". Where a development activity does constitute a "*controlled action*", an approval from the Commonwealth Minister of the Environment is required.

Gunninah consider that the proposed activities on the Project Site associated with quarrying have no potential to affect any Matter of National Environmental Significance other than (theoretically at least): a few listed threatened species and ecological communities; and/ora few (alleged or real) migratory species.

Migratory Species (EPBC)

In respect of migratory species Gunninah conclude that:

"There is no likelihood of a "significant impact" being imposed by the proposed activities on the subject land at Rock Flat upon even individuals of any "migratory species" listed in the EPBC Act."

Threatened Species (EPBC)

Gunninah conclude that there are no habitats or resources for any of the listed threatened fish, amphibian or mammal species in the areas to be affected by the project. Of the threatened birds listed, only the Regent Honeyeater, Painted Honeyeater and Swift Parrot could potentially occur in the vicinity or general locality. However, there is no habitat of relevance for any of these species on the Project Site. Two of the three threatened reptile species identified in the EPBC Act database (the Striped Legless Lizard *Delma impar* and Grassland Earless Dragon *Tympanocryptis pinguicolla*) have been recorded on the Project Site.

Striped Legless Lizard (EPBC)

A single specimen of the Striped Legless Lizard was located on the southern flanks of the knoll- albeit outside of the proposed quarry footprint. On the basis that this individual is part of a viable local population of the species, it is assumed that the species would occupy grassland habitats in the vicinity of the recorded individual. However, the higher parts of the hill appear less suitable habitat for this species, given the greater densities of shrubs and the more deeply embedded nature of the surface rock and stone. Refer also to **Figure 4.15**. The quarry project incorporates a range of measures to protect the Striped Legless Lizard and its habitat in the vicinity of the quarry operations, including the following:

- Supplementary surveys of all areas to be directly affected by the project prior to any clearing or earthworks – with the collection of animals and their relocation within the property to more remote suitable habitat.
- Enhancement of habitat further from the quarry site (*ie* downslope from the existing known location of the species) by the placement of additional stone and rock removed from the quarry operations footprint.
- Creation of new habitat following the cessation of quarrying operations.

On the basis of the impact amelioration measures identified above, the quarry proposal was considered by Gunninah as being unlikely to result in a "*significant impact*" being imposed upon the Striped Legless Lizard at this location.

Grassland Earless Dragon (EPBC)

Several specimens of the Grassland Earless Dragon were detected in two areas on the Project Site: to the northeast of the proposed quarry; and near the current entrance onto the property, near the Monaro Highway. The first of these records caused a re-design and relocation of the access/haul road - to avoid the habitat for this species (the areas of tussock grassland with scattered surface rocks and stones); and the second has resulted in an alternative location for the entrance point for the quarry project. Importantly, the access/haul road is now located principally through an area of 'improved pasture' – with a preponderance of introduced pasture species and a notably lower abundance of surface stones and rock. Neither the access/haul road nor any other elements of the Rock Flat Quarry project are located in areas occupied by the Grassland Earless Dragon. Refer also to **Figure 4.15**. On the basis of the field surveys to date and the relocation of the access/haul road, as well as the impact amelioration measures (as detailed above for the Striped Legless Lizard), Gunninah conclude that the project is considered unlikely to adversely affect the Grassland Earless Dragon at this location.

Threatened Ecological Communities (EPBC)

The EPBC Act database identifies three Threatened Ecological Communities (TECs) as occurring or potentially occurring in the area:

- 'Natural Temperate Grasslands of the South Eastern Highlands'.
- 'Upland Wetlands of the New England Tablelands and the Monaro Plateau'.
- 'White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland'.

Gunninah conclude that of those TECs, neither the 'Upland Wetlands' nor the 'Box-Gum Grassy Woodlands and Derived Native Grassland' is present on the subject land or subject site, or in the near vicinity. At first glance, the tussock grassland on the subject land and subject site appears to conform to the 'Natural Temperate Grasslands of the South Eastern Highlands' TEC. However, the long history of grazing of the land and the presence of introduced pasture and weed species in variable densities indicates that the tussock grassland does not satisfy the criteria for the 'Natural Temperate Grasslands of the South Eastern Highlands' TEC; for the following reasons:

- The tussock grassland is widespread at this locality.
- The community has survived the effects of grazing over a long period (in excess of 100 years), and still provides suitable habitat in parts for the two threatened reptiles noted above.
- The proposed quarry operations will occupy less than 10 hectares of the tussock grassland on the subject site.
- The proposal includes an array of measures to protect and/or regenerate the tussock grassland.

Given the considerations detailed above, Gunninah conclude that the tussock grassland on the Project Site and does not constitute an example of the 'Natural Temperate Grasslands of the South Eastern Highlands' TEC; although it is clearly a component community of the 'Temperate Montane Grasslands' of Priday (2007).

Gunninah also conclude that the proposed quarry development will not impose a "*significant impact*" upon the 'Natural Temperate Grasslands of the South Eastern Highlands' TEC; notwithstanding the temporary removal of approximately 10 hectares of the native tussock grassland from the Project Site. Nevertheless, for the purpose of 'abundant caution', a '*Referral*' of the Rock Flat Quarry project proposal has been made to the Commonwealth - pursuant to the EPBC Act. Refer to the Gunninah report, accompanying this EIS, for further details.

Ecological Considerations in Cooma-Monaro Local Environmental Plan 2013

The *Cooma-Monaro Local Environmental Plan 2013* (LEP) identifies portions of the Project Site on the *Terrestrial Biodiversity Map*- shown in Figure 3.2 of this EIS. Clause 6.3 of LEP 2013 states that, in respect of land so identified a consent authority must consider whether a proposed development "*is likely to have*":

"(i) any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and

(ii) any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna,

(iii) any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land,

(iv) any adverse impact on the habitat elements providing connectivity on the land."

In regard to clause 6.3 of the LEP the proposed quarry project has been designed, inter alia, to achieve the following objectives:

- To minimise or avoid, wherever possible, imposing adverse impacts "on the condition, ecological value and significance of the fauna and flora on the land".
- To limit adverse impacts on the vegetation present within the Project Site.
- To avoid any fragmentation of habitat and to limit the "*biodiversity structure, function and composition of the land*"; including *inter alia* by the proposed habitat and vegetation regeneration and creation proposed.

Additionally, and pursuant to Clause 6.3(3)(b) of the LEP, a consent authority is also required to consider "*any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development*" and to be satisfied that:

"(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or

(b) if that impact cannot be reasonably avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or

(c) if that impact cannot be minimised—the development will be managed to mitigate that impact."

In this regard the quarry development has been designed specifically, inter alia, to achieve the following outcomes:

- The avoidance of "*any significant adverse environmental impact*" by confining the project footprint and avoiding, wherever possible, habitats of value or relevance to threatened biota and biodiversity values generally.
- To The implementation of the impact amelioration and environmental management measures as proposed in order to minimise and mitigate the impacts of the proposal.

SEPP 44- Koala Habitat Protection

The aims of SEPP 44 are to protect the Koala and its habitat by identifying matters for consent authorities to consider during the assessment of proposals. The Cooma-Monaro LGA is listed in Schedule 1 of SEPP 44 as an area to which the Policy applies, and the Project Site is greater than 1 hectare in area. Consequently, SEPP 44 applies (at least theoretically) to the Project Site. SEPP 44 defines "potential koala habitat", as native vegetation in which trees listed in Schedule 2 of the SEPP "constitute at least 15% of the total number of trees in the upper or lower strata of the tree component". Schedule 2 of SEPP 44 provides a list of tree species recognised as Koala food trees.Gunninah find that none of trees listed in Schedule 2 of SEPP 44 are present on the Project Site. SEPP 44 defines "core koala habitat" as "an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population". Gunninah find that there is no relevant habitat for the Koala on the Project Site, nor is there any evidence for a "*resident population*" of Koalas. Gunninah conclude that given that the site does not represent "*potential koala habitat*", it cannot constitute "*core koala habitat*" pursuant to SEPP 44, and that there is no requirement to fulfil any requirements of SEPP 44 in respect of the proposed quarry development.

▪ 5.4 Section 79C(1)(c): Suitability of the Site for Development

The suitability of the site for the development is a key consideration in the assessment of any application under s79C(1) of the EP&A Act (*Lippmann Partnership Pty Ltd v Canterbury – Bankstown Council* [2017] NSWLEC 1601 February 2017 at [42]). The location of the quarry is determined by the presence of the resource of a quality to warrant ongoing extraction. The resource is a high quality volcanic resource of local, if not regional, significance. The quarry is suitable for the proposed development and has been designed having regard for known site constraints and opportunities. Refer also to Table 5.8.

Table 5.8: Suitability of the Site for Proposed Quarry Development

Item	Suitability of proposed quarry site
The extractive resource	Drilling of the site determined the boundaries of the resource and to confirm the extent of the rock mass at depth. The tests and on site investigations by the Applicant reveal a good sized extractive resource, with the core of the hill comprising a volcanic plug
Neighbourhood amenity, agriculture	Acceptable noise, vibration and air quality impacts are predicted. The land proposed for quarrying and related activities is well set back from and out of site from the nearest rural residences. The quarry site has limited visibility, with views in part from the nearest (Dwelling 1) and views of the peak of the knoll from Dwelling 5. Perimeter landscaping of pine trees is proposed to mitigate the visual impact of quarrying- to be established at project commencement. No conflicts with agriculture are likely
Hazards	The land does not appear to have any potential for contamination, thus satisfying SEPP 55 preconditions *per* Preston CJ in *Moorebank Recyclers Pty Ltd v Benedict Industries Pty Ltd* [2015] NSWLEC 40
Operational requirements	The Project Site provides more than sufficient land area for future extraction requirements.The area proposed to be quarried has a small environmental footprint relative to the size of the quarry resource to be won. The topography and geology of the Project Site is similar to that of the nearby Nimmitabel Quarry- also a volcanic plug. This quarry has operated in accordance with all relevant environmental and planning controls imposed by the relevant consent and EPL conditions
Suitability of the access arrangements	The Project Site has direct access to the Monaro Highway, with excellent sight distances available
Site features	The Project Site is located on an elevated undulating plain, with the volcanic plug found where there is a small hill. The quarry operations can be sited away from all nearby intermittent watercourses. There is no risk of flooding, given the elevated nature of the Site and local runoff concitions. All runoff from within the quarry is to diverted to the on-site detention basins to be then re-used within the quarry
Permissibility of the development	Extractive industries are a permissible use on the Project Site and the rail crossing permitted by SEPP Infrastructure 2007
Ecological values	It is not "likely" that the proposed quarry and/or its ancillary activities would impose a "significant effect" on any "threatened species, populations or ecological communities, or their habitats" pursuant to the relevant considerations in Section 5A of the EP&A Act or "significant impact" under the EPBC Act [Nevertheless, for the purpose of 'abundant caution', a 'Referral' of the Rock Flat Quarry project proposal has been made to the Commonwealth - pursuant to the EPBC Act] The proposed development satisfies the ecological provisions contained in the LEP. The Project Site does not represent "*core koala habitat*" as defined in SEPP 44. There is no requirement to fulfil any requirements of SEPP 44 in respect of the proposed quarry. ESD principles are satisfied (*Warkworth Mining Limited v Bulga Milbrodale Progress Association inc [2014]* NSWCA105 at [296] & [299])- refer Section 3.1.3 of the EIS
Heritage	The land proposed for quarrying and related activities is not identified in the LEP as comprising land with heritage value, with no archaeological sites found during on-site surveys

▪ 5.5 Section 79C(1)(d): Any submissions made

This application will be subject to notification for submissions. Any issues raised in those submissions will be duly considered prior to any final determination of the application.

▪ 5.6 Section 79C(1)(e): The Public interest

The Project involves the operation of a new quarry designed to ensure that environmental impacts are reduced to a satisfactory level. The impact assessment contained in this Environmental Impact Statement (EIS) demonstrates that the project complies with relevant planning and environmental legislation and meets many key environmental and operational requirements in terms of:

- Ease of access to a major road (Monaro Highway) and proximity to local markets.
- Good setbacks from existing rural residences.
- The proposed new quarry being visually concealed from most neighbours and with glimpses only from the Monaro Highway proximate to the site.
- Small environmental footprint of the proposed quarry.
- Quarry deposit of suitable size and quality to meet the known needs of markets in the region.
- The Applicant's extensive experience and good environmental track record in carrying out extraction operations from a volcanic plug resource at Nimmitabel, similar to that on the project site. Schmidt Quarries intend to apply similar sound, proven quarry management measures to the project site as are currently being applied at the Nimmitabel quarry.

It is in the public interest to approve the Project sought, in particular having regard for the following:

- With the planned closure of Nimmitabel Quarry shortly and the proposed establishment of this new quarry there will be a continued uninterrupted supply of quarry product to local, as well as regional, infrastructure projects.
- Related to the above, the proposed quarry development would enable Schmidt Quarries to relocate quarrying from their existing Nimmitabel quarry, now exhausted, and generate social and economic benefits by creating ongoing employment for up to 12 people on site.
- The Project will result in the more effective use of a significant, high quality quarry hard rock resource.
- Economic benefits to the local and regional economy through ongoing local employment, as well as the purchase of local goods and services and wages.
- The Project enables the maximisation of and economic recovery of a high quality volcanic quarry resource.

6.Conclusions

6.1 Overview

This Environmental Impact Statement (EIS) has been prepared by Outline Planning Consultants Pty Ltd on behalf of Schmidt Quarries to assist Council and the JRPP in assessing the proposal for a new hard rock quarry to be established at the Project Site, situated at Rock Flat, some 14km to the south of Cooma in the Snowy-Monaro LGA.

This environmental impact assessment has been prepared in accordance with Part 4 of the EP&A Act to assess the potential environmental impacts associated with the proposal. It provides an assessment of the potential environmental impacts of the proposal in accordance with the Secretary's Environmental Assessment Requirements (SEARs) for an EIS, issued on 20 March 2017. In accordance with the issued SEARS various environmental investigations were undertaken during the preparation of the EIS to assess the potential environmental impacts associated with the quarry project. These included specialist assessment on issues involving potential environmental impacts relating to noise and vibration from quarrying, ecological impacts; aboriginal heritage; soils and water; traffic and transport; and water.

The proposed new quarry seeks to extract rock from a volcanic plug, an artefact of past volcanic activity in the Monaro region. The location of this small volcanic plug has determined the location of the quarry as well as the quarrying methods to win the hard rock resource. In this context, the proposed quarry and associated works are sited within areas identified as being the best available location for the proposal.The EIS has documented the potential environmental impacts associated with the quarry proposal, considering both potential positive and negative impacts of the proposal, and includes mitigation measures to protect the environment where required, and in particular:

- Visual impact of quarry operations.
- Direct and indirect ecological impacts during establishment and running of the quarry operation.
- The access to the quarry to and from the Monaro highway, necessitating a new, upgraded highway access point, and new crossing over a disused rail crossing.
- Noise attenuation measures at the quarry.

The mitigation measures proposed are practical, feasible and reasonable from a cost and engineering perspective. The Project will assist in meeting the demand for quarry products in the region in the future. The quarry is well positioned to service various roads and associated projects to the west and to the east.

6.2 Policy Context

The Project aims to meet Government objectives and strategies in environmental management including:

- The provisions of the EP&A Act 1979 generally, and the SEARs issued for this EIS by the Secretary of the NSW Department of Planning & Environment in particular.
- State Planning Policy Framework with adherence to relevant safety, health and environment management practices.
- Cooma Monaro Local Environmental Plan 2013.
- Commonwealth legislation.

6.3 Justification

The location of the quarry is determined by the presence of the resource of a quality to warrant ongoing extraction. This project, if approved, will provide a long-term, high quality supply of hard rock material into the local and regional markets. Approval of this resource is needed to replace supply from Schmidt Quarries' existing Nimmitabel quarry, located some 12km to the south, that is nearing the end of its economic life. Schmidt Quarries urgently needs to replace its existing quarry at Nimmitabel, where the resource is almost exhausted- it too being a volcanic plug, similar to that now proposed to be extracted on the Project Site. The Rock Flat quarry site has been identified as a high quality volcanic rock well suited to aggregate production and other similar quarry products.

Approval of this new quarry will enable Schmidt Quarries to continue to operate as a reliable, environmentally responsible supplier of quarry products to the region to meet the expected ongoing demand for quarry products region. The Project will provide ongoing direct employment for 12 staff at the Nimmitabel Quarry, as well as flow-on employment for contractors and others in allied industries. The Project offers the following benefits:

- **A proven quarry resource:** The hard rock resource comprises a volcanic plug that is capable of being economically and efficiently worked by the quarry operator.
- **Proven quarrying methods to be employed:** Schmidt Quarries intends to operate the quarry utilising proven, satisfactory quarry management techniques as employed at the nearby Nimmitabel quarry- like the proposed quarry, also a volcanic plug. Additional, site-specific mitigation measures are also proposed.
- **Appropriate scale of quarrying proposed:** The proposed rate of extraction reflects the quality of the hard rock material and regional demand for the products generated. The project seeks to extract valuable hard rock from a relatively contained environmental footprint (ie. maximum efficiency with least environmental disturbance).
- **Good highway access:** Ease of access to a major road (Monaro Highway) and proximity to local/regional markets.
- **Setbacks from neighbours:** Good setbacks from existing rural residences not associated with the proposed quarry, the nearest residence more than 1.6km away.

Additionally, the assessment of the potential environmental and social impacts of the Project outlined in the EIS assessment demonstrate that the impacts associated with this development are able to be predicted with a high level of certainty, and are acceptable.

6.4 Ecological, Economic and Social Sustainability

The EIS has evaluated the Project in relation to its impacts on the environment and in terms of its economic and social benefits, and has provided details of the mitigation measures proposed to ensure that these outcomes eventuate. The EIS process ensures that the proposed quarry development is ecologically sustainable, provides economic benefits both at the local level and regional level, delivering benefits to the broader community as well as at the local level.

Economic Sustainability

Quarries provide an essential supply of materials for maintenance and development of infrastructure in the local area and in the broader region, for economic activities including land subdivisions, roads and infrastructure projects.The quarry will provide for ongoing employment of 12 staff staff currently employed at the nearby Nimmitabel quarry, generating wages of approximately $1.3 million. Maintaining this workforce and the continuing supply of valuable extractive industry resources from this locality would be a positive outcome for the local and regional economy.

The Project would provide major economic benefits in the form of annual operating income of between $4.5 million (at 150,000 tonnes per annum) and $8.4 million (at 280,000 tonnes per annum) [NOTE: including truck haulage of quarry product.] Much of the operating expenditure is likely to occur within the local area and is likely to produce additional indirect effects to other local industries, potentially generating up to 24 more jobs locally.If an output multiplier of 1.5 is used, the economic output of all other nearby industries within NSW would increase by between $6.75 million (at an average of 150,000 tonnes per annum) to $12.6 million (at maximum production of 280,000 tonnes per annum).

Social Sustainability

The Project offers social benefits in terms of the maintenance of employment opportunities for existing quarry workers, acceptable impacts on local amenity, and the development of a resource that will assist in the construction, rail, roads and infrastructure, helping to provide a more vibrant economic environment. The proposed new quarry will be compatible with adjacent land uses. Mitigation and other quarry management measures are prescribed to ensure ongoing compatibility.

Environmental Sustainability

The EIS finds that the project can be undertaken with acceptable environmental impacts, backed up by the environmental management regime outlined in this EIS.

▪ 6.5 Environmental Management & Risks

Schmidt Quarries currently operates from an approved, lawfully operating quarry at Nimmitabel, approximately 12km south of the Project Site, and directly employs 12 people. The existing Nimmitabel quarry consent permits up to 100,000 cubic metres (approx. 280,000 tonnes) of quarry product per annum being extracted from this quarry. The company's Nimmitabel quarry operates under an Integrated Risk Quarry Management system that covers health and safety, environmental management systems and quality maintenance issues based on Australian Standards, in accordance with an existing local council consent and an Environment Protection Licence from the NSW EPA. The intention is to apply the same or similar standards to the conduct of the proposed new quarry at Rock Flat.

The SEARS for this Project identified various environmental issues that may arise from the proposed quarry development, summarised as follows:

- Noise, blasting & vibration
- Air quality
- Water
- Biodiversity
- Heritage
- Traffic & transport
- Land resources
- Waste
- Hazards, risk assessment (addressed in this table)
- Visual
- Rehabilitation

Social and economic considerations have ben addressed elsewhere in the EIS report, as are local and state planning issues. The *risks associated with* these issues is *considered to* be LOW or MODERATE-LOW in respect of this Project, having regard for the nature of the proposed development, the mitigation strategies that form a part of the Project, and certainty in the likely impacts arising (*Weal v Bathurst City Council & Anor* [2000] NSWCA 88).

The focus on this part of the EIS is to address the risk associated with quarrying activities on the site having regard for the mitigation measures proposed. The following environmental risk analysis was undertaken as part of the EIS assessment. The risk analysis provides a summation of the key activities associated with the proposed operation of the quarry that may impact the local environment, having regard for the mitigation strategies to be implemented, which also form a part of the quarry project to be assessed.

This EIS provides an assessment of the environmental impacts of the proposed quarry on the Project Site, at Rock Flat, NSW in accordance with the Secretary's Environmental Assessment Requirements (SEARS) and after having prioritised all key SEARS issues of most relevance to this quarry development.

The EIS also provides details of the proposed measures at the Project Site to appropriately manage and mitigate potential impacts identified, arising from the proposed quarry expansion.

The mitigation measures proposed for the project are practical, feasible and reasonable from a cost and engineering perspective.

The mitigation strategies outlined includes the environmental management principles which would be followed in the planning, design, construction and operation of the proposal, if approved, including an outline of an ongoing environmental management plan.

The mitigation strategies form a fundamental part of this proposed quarry project, as confirmed by Pepper J in *Friends of Tumblebee Incorporated v ATB Morton Pty Limited (No 2) [2016]* NSWLEC 66 (11 March 2016) at [78] referring to the established case law on this issue per *Newcastle & Hunter Valley Speleological Society Inc v Upper Hunter Shire Council and Stoneco Pty Limited [2010]* NSWLEC 48:

> *"78. Fourth, the description of the development the subject of a development application is not restricted to the nature, extent and other features of the development, but can also include measures that ameliorate or mitigate, prevent, remedy or offset the impacts of the development (Newcastle & Hunter Valley Speleological Society at [82]).This means that ameliorative measures not proposed as part of the development, but that are imposed later as conditions to the consent, are not able to be considered because the statutory inquiry is directed to the likely impact of the proposed development prior to, and not after, the determination of the application (Newcastle & Hunter Valley Speleological Society at [83] and the cases cited thereat)."*

These measures have been proposed in response to the risks identified and significance.

In the case of the Project, the quarry is proposed to be run in a manner similar to that of Schmidt Quarries Nimmitabel quarry operation, utilising similar, proven quarry mitigation and management strategies. [NOTE: Like the quarry resource at Nimmitabel quarry the resource found on the Project Site is also a volcanic plug] In addition, the proposed quarry adopts other, site-specific measures and mitigation strategies that arise from the particular nature of the Project Site and its environment.

For instance, the haul route has been re-designed such that it avoids the habitat of the Grassland Earless Dragon- an appropriate precautionary measure. A further example: acoustic mounding is to be used, even though predicted noise impacts without the use of such mounds would fully comply with the EPA's current *Noise Policy for Industry* (2017).[NOTE 1: The precautionary principle should not be used to try to avoid all risks. A zero risk precautionary standard is inappropriate. Precautionary measures should be taken to avert the anticipated threat of environmental damage, but they should be proportionate- *per* Preston J in the NSW Land & Environment Court case *Telstra Corporation Ltd v Hornsby Shire Council [2006]* NSWLEC 33. NOTE 2: The modified route of the internal haul road in the vicinity of this lizard's habitat follows land under 'improved' pasture. This modified land has a much lower ecological value than the lands containing the habitat of the Grassland Earless Dragon, a principle recognised in *BT Goldsmith Planning Services Pty Ltd v Blacktown City Council [2005]* NSWLEC 210]

These features of the proposed quarry development will reduce the risk of unacceptable impacts arising as a consequence of carrying out quarrying activities on the Project Site. Risk identification involves the identification of risk sources, events, their causes and their potential consequences. Risk is the chance of something happening that would have an impact on the environment or operation of the Project. It is measured in terms of consequence (C) and likelihood (L), as set out in the following tables.

Table 6.1: Qualitative Consequence Rating (C)

Level	Consequence Descriptor	Description
1	Insignificant	Negligible and temporary detrimental impact on the environment Affects an isolated area No remediation costs Reportable to internal management only No operational constraints posed No injuries or health impacts
2	Minor	Minor detrimental impact on the environment Affects a small area Minimal remediation costs Reportable to internal management only No operational constraints posed Minor injuries which would require basic first aid treatment
3	Moderate	Substantial temporary or minor long-term detrimental impact on the environment Moderately large area of impact Moderate remediation cost Reportable to government agencies Further action may be requested by government agency Injuries requiring medical treatment
4	Major	Extensive and/or permanent detrimental impacts on the environment Large area of impact Very large remediation costs Reportable to government agencies Possible prosecution and fine Serious injuries requiring medical treatment
5	Catastrophic	Massive and permanent detrimental impacts on the environment Very large area of impact Massive remediation costs Reportable to government agencies Large fines and prosecution resulting in potential closure of operation Severe injuries or death

(Source: modified after Standards Australia HB 203-2006 and HB 89-2013)

The likelihood of an environmental impact occurring was then rated according to the following. In risk management terminology, the word 'likelihood' is used to refer to the chance of something happening.

Table 6.2: Qualitative Risk Likelihood Rating (L)

Level	Likelihood Descriptor	Description
A	Almost certain	Is expected to occur in most circumstances
B	Likely	Will probably occur in most circumstances
C	Possible	Could occur
D	Unlikely	Could occur but not expected
E	Rare	Would occur but only in exceptional circumstances

(Source: modified after Standards Australia HB 203-2006 Table 4(A) and HB 89-2013)

Based on the above, a risk rating matrix is developed, as set out in the accompanying Table 6.3.

Table 6.3: Risk Rating Matrix

Matrix	Consequences (C)				
Likelihood (L)	**1** Insignificant	**2** Minor	**3** Moderate	**4** Major	**5** Catastrophic
A (Almost Certain)	H	H	E	E	E
B (Likely)	M	H	H	E	E
C (Possible)	L	M	H	E	E
D (Unlikely)	L	L	M	H	E
E (Rare)	L	L	M	H	H

LEGEND	RISK LEVEL
E	**Extreme**- Immediate action required.This level of risk likely to preclude any development proceeding
H	**High**- In-depth assessment required.Ultimately, may result in development not proceeding
M	**Moderate**- Management responsibility (specified).Unlikely to preclude development
L	**Low**- Routine management required only. Unlikely to have significant impacts

(Source: modified after Standards Australia HB 203-2006 Table 4(C) and HB 89-2013)

Environmental risks and impacts of the proposed quarry development for the whole of the Project are summarised in the accompanying Table 6.4, including those potential environmental issues identified in the issued SEARS.[NOTE: The risks have been assessed having regard for the specific nature of the extraction operations proposed on the Project Site, and after incorporating the mitigation measures as described in Sections 2 and 5 of the EIS document. Through the implementation of the various proposed quarry management and mitigation measures above the residual (ie. mitigated) risk rating for the project has been derived, in most cases the potential environmental impacts have been reduced. It is intended that the quarry management and mitigation measures will form part of a quarry management plan, to be prepared following the grant of consent to the Project. The table thus illustrates residual risk remaining, after these mitigation measures have been implemented.]

Table 6.4: Project Risk Analysis Table (with mitigation measures in place)

Environmental Issue	Source of potential environmental impact	Mitigation measures/risk treatment	C	L	Risk Level
Noise, blasting & vibration	Initial site works, including earthworks associated with quarry processing area, bunds, drainage controls and building of internal quarry access route	In the main, the quarry is shielded by existing hills and/or set well back from nearby residences.	1	D	LOW
	Transport of plant & equipment to the site at commencement	Plant & equipment coming from nearby Nimmitabel quarry operations, minimising noise impacts on highway. Set back from local residences	1	D	LOW
	Noise from plant & equipment on local residents	Set well back from residences + use of acoustic bunds to achieve full noise compliance [NOTE: noise would comply with 2017	2	D	LOW
	Noise from quarry truck traffic transporting quarry products off-site	Well buffered from surrounding residences	2	D	LOW
	Noise & vibration from blasting	Will be regularly monitored to ensure that it complies with blasting standards. Each blast event to be within acceptable guidelines	2	C	LOW
Air quality	Dust from processing plant and from quarry trucks on internal haul route	Dust control measures proposed including regular watering of the internal haul route and at quarry processing plant. Some dust generated on site, with minimal off-site impacts	2	B	M-LOW
	Dust from blasting	Dust control measures proposed	2	C	LOW

Environmental Issue cont.	Source of potential environmental impact cont.	Mitigation measures/risk treatment	C	L	Risk Level
Water	Potential for discharge of 'dirty' water from working quarry	Stormwater runoff from active quarry areas (ie. 'dirty' water) is to be held in the quarry sediment basin and then re-used within the quarry and on the haul route for dust suppression purposes. 'Clean' water to be diverted from the quarry site. Bunding for all fuel storage areas proposed.	2	D	LOW
	Potential for reliance on water in watercourses for quarry use	No use of water from local waterways proposed to supply quarry water needs	2	D	LOW
	Potential for erosion impacts and sedimentation of local waterways	Acoustic bunds to be revegetated in initial phases of quarry. Catch drains and silt traps to be installed below bunds	2	D	LOW
	Potential for impact on groundwater, reduced availability of groundwater or impacts on groundwater dependent ecosystems	Drilling of the site reveals no groundwater source around the volcanic plug to be quarried. No use of bores proposed to supply quarry water needs. No impacts on groundwater dependent ecosystems	1	D	LOW
Biodiversity	The impact on threatened fauna from works associated with construction and ongoing use of internal quarry haul route	The route of the internal haul route has been modified, to avoid known habitats of the threatened GED lizard. Use of the road only during daylight hours and not at night	2	D	M-LOW
	Reduction in significant habitats or impacts on significant flora/fauna arising from proposed quarry and/or quarry infrastructure area	No likely impact on threatened or significant habitat on land immediately adjoining active quarry area. Mitigation measures proposed	1	E	M-LOW
Heritage	The impact on archaeological or cultural sites and artefacts or heritage values	None found	1	D	LOW
Traffic & transport	Traffic and road safety impacts	A driver code of conduct, addressing transport of materials to minimise traffic noise and improve traffic safety, is proposed. Highway has adequate capacity to absorb quarry truck traffic proposed	2	D	M-LOW
	Need for upgrading of intersection, adequacy of sight distances	Intersection with Moraro Highway to be upgraded in accordance with RMS requirements- adequate sight distances provided	2	C	M-LOW
	Crossing of disused rail line	Permissible under SEPP (Infrastructure) 2007. No apparent issues raised by John Holland (on behalf of Transport for NSW)	1	D	LOW
Land resources	The potentiation for contamination	Minimal potential for contamination. Consistent with SEPP 55. The hard rock has minimal potential for asbestos	1	D	LOW
	The potential for conflicts with agriculture	The land has a low agricultural suitability	1	E	LOW
	Loss or degradation of soils, erosion potential	Sufficient topsoil available for storage of and use in acoustic bunds.The method of revegetation of the overburden emplacement areas and acoustic bunds would be similar to that employed at the Applicant's Nimmitabel Quarry	1	D	LOW
Waste	Storage and disposal of waste	Collection and storage of waste oil and grease in a bunded areas, with all other waste appropriately stored and/or disposed of	1	D	LOW

Environmental Issue cont.	Source of potential environmental impact cont.	Mitigation measures/risk treatment	C	L	Risk Level
Hazards, risk assessment	Storage of dangerous goods and bushfire hazards	No dangerous goods proposed to be stored on site. The land is not mapped as being bushfire prone, however, various bushfire mitigation measures are proposed	1	D	LOW
Visual	The potential for visual impacts associated with the quarry	The knoll proposed to be quarried is visible from only 2 nearby rural dwellings- in part only. Extraction will occur behind the knoll until level with ridge- thereafter the extraction occurs below the level of the ridge, out of sight of any viewer. Perimeter plantings of pine trees at establishment and bunding/mounding, together with natural topographic barriers, will ensure that visual impacts are acceptable. Additionally, preliminary establishment works may be initially visible from the highway to the east (oblique views only) and from nearest residence to the SE until stabilised with new plantings (short term impacts)	2	C	M-LOW
Rehabilitation	Rehabilitation soils and vegetation	Revegetated areas are to be carefully managed. Overburden emplacement areas and acoustic mounds are to be landscaped during the life of the quarry. There will be sufficient topsoil to undertake a comprehensive rehabilitation of the quarry site and surrounds. Proven rehabilitation methods are to be employed on the site. Native tussock grasses to be planted out in any disturbed areas during the life of the quarry and after quarrying has ceased	2	D	LOW

▪ 6.6 Evaluation of the Project

The EIS has adequately assessed the environmental impacts associated with the proposed quarry development, supported by the accompanying specialist reports, in accordance with the relevant requirements of the EP&A Act, including the objects of the Act and the principles of ecologically sustainable development.

The proposed quarry, having an overall footprint of 14.2ha, including 7.03ha devoted to the actual quarry extraction area, only takes up 0.71% of the total area of the rural property of which it forms a part -the total rural holding having an area of some 2,000ha in total. Moreover, with the progressive rehabilitation of the site and the implementation of the proposed rehabilitation and mitigation measures over the life of the quarry net beneficial biodiversity outcomes are likely to be achieved. Visual impacts are limited. Key habitats are avoided.

The proposed quarry development and mitigation strategies proposed will result in acceptable (generally low, or low-medium) risks. The mitigation strategies proposed reflect current quarry best practice.

Importantly, the proposed quarry development, if approved, will enable Schmidt Quarries to relocate quarrying from their existing Nimmitabel quarry, now exhausted, and generate social and economic benefits by creating ongoing employment for 12 existing quarry employees.

On the basis of the assessment in this EIS the site is suitable for the development, and on balance, the benefits of the proposal outweigh the potential costs.

Consequently, the proposed quarry development is considered to be in the public interest, and should be approved, subject to appropriate conditions of consent.

7. Select References

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8. Glossary of Terms

Term	Meaning
AADT	Annual Average Daily Traffic.
Acoustic	Relating to hearing, noise and sound.
Ambient	Surrounding, background or existing.
Aggregate	Rock crushed to the required size for use in concrete, masonry products, road sealing, pavement materials and other uses.
Air Blast Overpressure	Air vibration or air blasts are the pressure or shock waves that radiate in air from an exploding charge. When a pressure wave passes a given point, the pressure of the air rises rapidly before returning to atmospheric pressure after a period of oscillations. The maximum pressure is the 'Air Blast Overpressure' measured in dB.
AHD	Australian Height Datum. The standard reference level used to express the relative elevation of various features. A height given in metres, AHD is essentially the height above sea level.
Ambient noise	This is the total encompassing sound in a given situation at a given time where no particular sound is dominant. It is composed of sound from all sources near and far, normally experienced in the area. Ambient noise is measured as dB ('A' weighted) over a set period of time.
ANZECC	Australian and New Zealand Environment and Conservation Council.
Attenuation	Reduction in sound level between a noise source and another location.
A-Weighted Sound Level dB(A)	A level of sound pressure in which the sound pressure levels of the various frequency bands have been weighted to accord roughly with human aural system frequency sensitivity.
Batter	The face of the slope eg. quarry walls, banks, cuttings, etc.
Basalt	Fine grained, dark volcanic igneous rock.
Biota	Means the animals and plants, and other organisms, of a geographic region or locality
(Quarry) Bench	A ledge constructed in a batter or natural slope within a quarry. A step in the face of a quarry.
Biodiversity	Biological variety at genetic, species and ecosystem scales. The maintenance of biodiversity, at all levels, is acknowledged internationally as a high conservation priority.
Blasting	The operation of breaking rock in a quarry by means of explosives.
Bund	An earthen mound wall which may be used for noise attenuation or visual screens or for redirecting stormwater/runoff around a part of a site. Bunds may also be used to contain spillage of liquid materials.
Catchment	Drainage area of a river, creek (or working quarry). Can also refer to a visual catchment, which is the area within view of a particular viewing location, or road catchment, which is the area reliant on a particular road in order to gain access to another centre or locality.

Term	Meaning
Crushing	The mechanical process of reducing quarry rock size usually by pressure or impact.
Contour Drain	Drainage channel constructed approximately along the contour, and which is designed to slow down and direct the flow of water across a disturbed area to a sediment trap for sediment removal.
DA	Development Application.
dB (A)	To approximate the human response to sound, noise level meters have weighting networks which correspond approximately with subjective loudness. The 'A-Weighting' is used to simulate human hearing.
DECCW	NSW Department of Environment, Climate Change and Water (now a part of the NSW Office of Environment and Heritage ("OEH")).
Deposited Plan (DP)	Deposited Plans (DP) define legal boundaries of land and often record subdivisions, easements and the like.
Director General	Director General of the NSW Dept. Planning & Infrastructure.
Designated Development	Section 77A of the *Environmental Planning and Assessment Act 1979* states that "*Designated development is development that is declared to be designated development by an environmental planning instrument or the regulations.*" Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* defines the type of development which is classified as designated development.
Drainage Line	A natural depression with no stream bed channel, which may only carry surface water during rainfall events.
Dust or particulate matter	Dust or particulate matter are terms used to define solid or liquid particles that may be suspended in the atmosphere. The potential affect of particulate matter on the environment, human health and amenity depends on the size of the particles, the concentration of particulate matter in the atmosphere and the rate of deposition.
EEC	Endangered Ecological Community
Ecologically Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
EIS	Environmental Impact Statement.
Emission	The release of material into the environment (eg dust).
Environment	A general term for all the conditions (physical, chemical, biological and social) in which an organism or group of organisms (including human beings) exists.
EP&A Act	NSW Environmental Planning and Assessment Act 1979.
EPA	NSW Environment Protection Authority.
EPL	Environment Protection Licence.
Erosion	The process of wearing away of the land surface (whether natural or artificial) by the action of water, wind.

Term	Meaning
Excavator	Item of earth moving equipment either tracked or wheeled fitted with a bucket on an articulated boom and used for digging material from a quarry pit face in front of, or below the machine.
Extraction	A term synonymous with quarrying. Under the Environmental Planning and Assessment Act, 1979, quarrying is defined as "extractive industries".
Flocculation Treatment	The addition of an approved agent to water with high suspended sediment levels that cause the suspended material to clump together and fall out of solution as sediment.
Flora and fauna	Plants and animals.
ha	hectare
Integrated Development	Development which requires development consent and one or more of the approvals listed in Section 91 of the Environmental Planning and Assessment Act 1979.
Habitat	The place where an organism normally lives; habitats can be described by their floristic and physical characteristics.
Haul Road	Road used in quarry for haulage of extractive material from the worked quarry face to processing areas and for general site access to markets beyond the quarry.
Holocrystalline	Volcanic rocks in which mineral grains can be recognised with the unaided eye.
km	Kilometre
L_{Aeq}(time)	Equivalent sound pressure level: the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring.
L_{A90}(time)	The A-weighted sound pressure level that is exceeded for 90 per cent of the time over which a given sound is measured. This is considered to represent the background noise e.g. LA90 (15 min).
Lithosol	An azonal soils having no clearly expressed soil morphology and consisting of a freshly and imperfectly weathered mass of rock fragments; largely confined to steep hillsides or areas where rock tends to outcrop close to the surface.
Local Environmental Plan (LEP)	Local Environmental Plans are planning documents prepared by a Council which detail the zoning of land and the type of development which is permitted with consent in a particular zone. Controls on development are also provided.
m/s	Metres per second
MIC	Maximum instantaneous charge for blasting, measured in kg.
ML	Megalitre: 1,000,000 litres.
Monitoring	The regular measurement of components of the environment to ensure that environmental guidelines standards are being met. eg. monitoring of noise from quarry blasting.

Term	Meaning
OEH	NSW Office of Environment & Heritage
Overburden	Subsoil and decomposed rock overlying the main quarry rock body- a low value quarry material.
Peak Particle Velocity	A measure of ground vibration caused by quarry blasting reported in millimetres/second (mm/sec)
Processing Plant	A combination of crushers, screens, conveyors and chutes typically found in a working quarry.
Quarry Plan of Management/ Environmental Management Plan	A document that details the management measures (including controls, monitoring and other safeguards) to be implemented during a the life of a quarry development.
(Quarry) Processing Plant & Facilities, Quarry Infrastructure Area	In the case of a quarry extraction operation, the combination of crushers, screens, conveyors and the like used to reduce the size of the rock and separate it into various sized products. Used in association with other quarry plant that includes aggregate pre-coating facility, fuel storage, sheds, offices, haul roads, weigh bridge and sediment basins, collectively forming a part of a quarry infrastructure area.
RL	Reduced Level. A height of the land relative to an established datum- usually AHD.
Rehabilitation	The preparation of a final landform after quarrying is completed and its stabilisation with grasses, trees and/or shrubs.
Regional Environmental Plan (REP)	A planning instrument made by the State. Regional Environmental Plans deal with planning issues of regional significance.
River	River has the meaning given under the Water Management Act 2002. In summary, this is "any watercourse, whether perennial or intermittent and whether comprising a natural channel or a natural channel artificially improved".
Road Base	Road pavement usually made up of densely graded crushed rock in varying sizes.
RMS	NSW Roads & Maritime Services (formerly NSW Roads and Traffic Authority- RTA).
Scenic quality/visual	The values of visible components of landscape which contribute to its scenic characteristics.
Screening	A process which separates quarry product into various sizes, usually involving a mechanical vibration of the rock over a series of decks fitted with steel mesh, steel plate and/or polyurethane and/or rubber mats with fixed sized apertures.
Sealing aggregate	Crushed rock usually of uniform size bonded by bitumen on the surface of the road to form a wear surface.
Sediment pond/ basin	Collects waterborne sediment from disturbed areas within the quarry and stores that water while suspended sediments fall out of solution (settle).

Term	Meaning
SEE	Statement of Environmental Effects, required for a development application (DA) lodged pursuant to the provisions of the (NSW) EP&A Act.
Shot rock	Rock won from blasting at a quarry
Soil Landscape	An area of land that has recognisable and describable topography and soils that are capable of being represented on maps and of being described by concise statements. The Soil Conservation Service of NSW has published a Soil Landscapes Series, describing the soils of NSW.
Stakeholder	Persons, groups, government and semi-government agencies, and non-government organisations with a legitimate interest in the process of assessment, its inputs and outcomes, as described in the Director General's Requirements.
State Environmental Planning Policy (SEPP)	A planning instrument made by the State. These Plans deal with planning issues of State significance.
The Site, or Project Site	Refers to the land upon which the proposed development is to take place.
Tertiary	Period of geological time, prior to the Quaternary, 65 million years ago- usually associated with volcanic activity
Threatened species	Species of flora and fauna that are listed as endangered species or vulnerable species.
Weathered Rock	Rock affected to any degree by the processes of chemical or physical weathering.
Vesicles	Found in basalt rock. A small cavity in a volcanic rock that was formed by the expansion of a bubble of gas that was trapped inside the lava. Vesicles are commonly found in volcanic rocks– that is, in rocks that solidified from lava.
Visual Analysis	Landscape analysis based on visual qualities only, excluding consideration of heritage, cultural or social values
Visual Catchment	Land within view-sheds. View-sheds are edges or limits to views from a single place or combination of viewpoints.
Volcanic plug	A volcanic plug, also called a volcanic neck or lava neck, is a volcanic object created when magma hardens within a vent on an active volcano. If a plug is preserved, erosion may remove the surrounding rock while the erosion-resistant plug remains, producing a distinctive upstanding landform.
vpd, vph	Abbreviations of vehicles per day (vpd), vehicles per hour (vph).
Zone	A planning tool used to apply planning policy and provisions of an environmental planning instrument to specific areas of land within a local government area.

APPENDICES

Environmental Impact Statement

Proposed Quarry
Rock Flat, NSW

FEBRUARY 2018