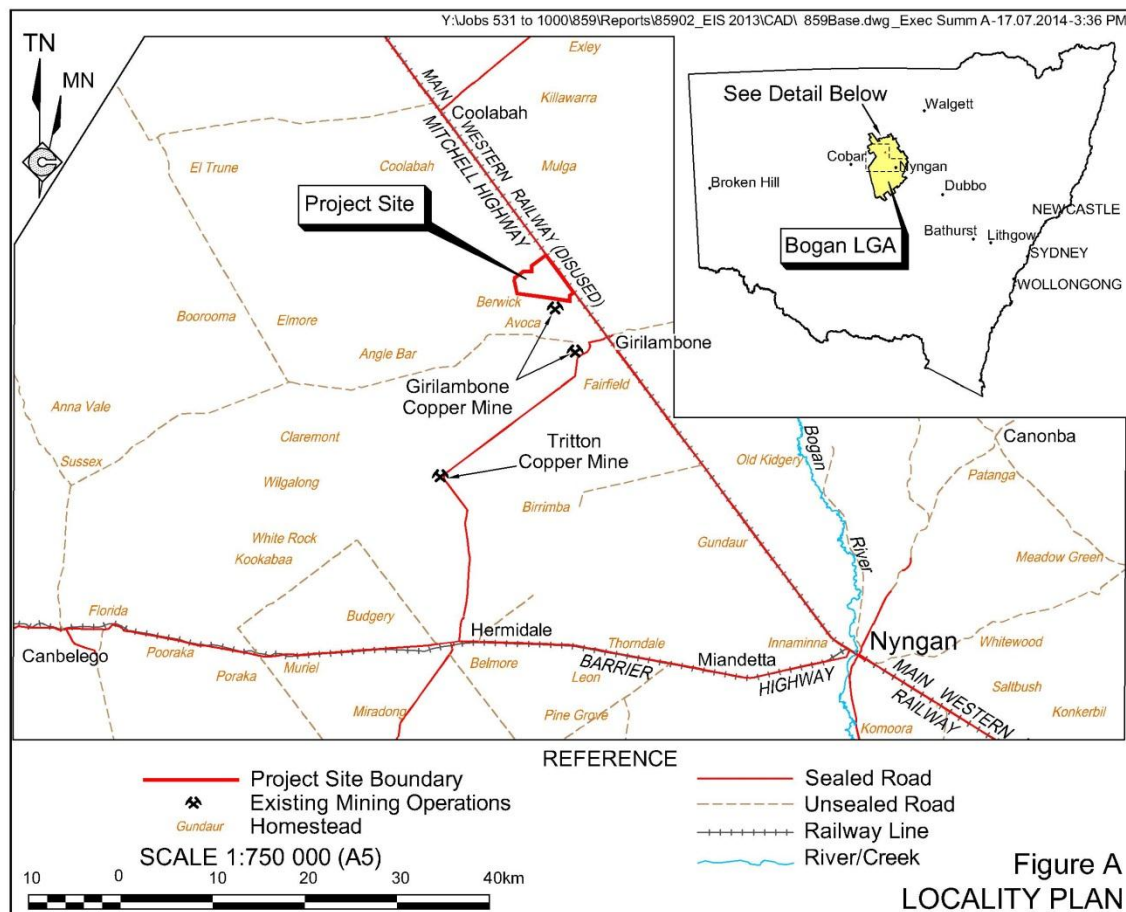


# Executive Summary

## INTRODUCTION

This *Environmental Impact Statement* has been prepared by R.W. Corkery and Co. Pty Limited, to accompany an application for development consent by Tritton Resources Pty. Ltd. (the Applicant), to develop and operate the Avoca Tank Project (the Proposal). The Proposal, which has a projected life of 7 years, would involve the development of a box cut and portal with an associated decline, permitting underground mining operations to occur in the identified mineralised zones. Associated surface infrastructure, including a run-of-mine Pad, waste rock emplacement, hardstand areas, water management structures and internal roads would also be constructed and maintained throughout the life of the Proposal.

The application area for the Proposal (the Project Site) is located approximately 2km north of the Applicant's existing Girilambone Copper Mine (North East Open Cut and Underground Mine), 24km northeast of the Applicant's Tritton Copper Mine, 7km northwest of the village of Girilambone, and approximately 55km northwest of the township Nyngan (**Figure A**). Access to the Project Site would be via the Mitchell Highway, Booramugga and Yarrandale Roads and the Applicant's private haul road from the North East Open Cut and Underground Mine to Booramugga Road.



The Project Site occurs on private land held by Mr P Johnstone. Mr Johnstone has consented to the application for development consent.

The Proposal is classified as;

- “Designated Development” under Clause 25 of Schedule 3 of the *Environmental Planning and Assessment Regulations 2000* as it would result in more than 4ha of disturbance; and
- “Regional Development” under Clause 5 of Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*.

The application is to be determined by the Joint Regional Planning Panel under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). An *Environmental Impact Statement* is required to accompany the application for development consent. Bogan Shire Council will exercise its functions in relation to receipt, notification and assessment of the application and associated fees.

This executive summary introduces the Applicant, provides relevant background information about the Proposal, presents an overview to the Proposal’s design and operational safeguards, as well as a brief description of the local environment and predicted impacts on the surrounding physical, biological and socio-economic environment.

## THE APPLICANT

The Applicant, Tritton Resources Pty Ltd, is a wholly owned subsidiary of Straits Resources Limited (Straits). The Applicant, through its associated companies, has operated the Tritton and Girilambone Copper Mines since 1992.

Straits is an established copper mining and exploration company listed on the Australian Securities Exchange and comprises an experienced Board and Management team focussed on operational excellence and strengthening the Company’s corporate structure.

Straits flagship asset is the Tritton Copper Mine, located approximately 24km southwest of the Project Site and produces approximately 25 000t of copper concentrate and copper cement annually from a combination of the Applicant’s regional mining operations.

## PROPOSAL OBJECTIVES

The Applicant’s objectives in constructing and operating the Proposal are as follows.

- To safely mine the identified copper-gold-silver reserves.
- To operate the Proposal in a manner that would minimise surface disturbance and impacts on surrounding residents and the local environment.
- To implement a level of management control and mitigation measures that ensures compliance with appropriate environmental criteria and reasonable community expectations.
- To develop and operate the Proposal in compliance with all relevant statutory requirements.
- To provide for the ongoing monitoring of local environmental parameters such as noise, water and air quality.
- To create a final landform that is suitable for a continuation of intermittent grazing.

- To achieve the above objectives in a cost-effective manner to ensure security of employment for the Applicant's workforce and the continued economic viability of the Applicant.

## PLANNING CONTEXT

The Project Site is situated within land zoned Zone RU1 – Primary Production under the *Bogan Local Environment Plan 2011 (Bogan LEP)*. *Underground mining is not identified as permissible within Zone RU1. However, Clause 70(1)(b) of the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) (Mining SEPP) identifies that mining is permissible, with consent, on any land where agriculture is permissible. As agriculture is permissible within Zone RU1, underground mining is also permissible, with consent.*

The Proposal would be developed and operated in accordance with a number of State planning instruments and regional strategies, namely;

- *State Environmental Planning Policy (State and Regional Development) 2011;*
- *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries);*
- *State Environmental Planning Policy (Rural Lands) 2008; and*
- *Central Western Catchment Management Authority (CW-CMA) – Catchment Action Plan 2006 – 2016.*

The *Environmental Impact Statement* addresses each of the above documents together with the *Bogan LEP*.

## APPROVALS REQUIRED

In addition to development consent, the Applicant anticipates the following approvals, licences and leases would be required.

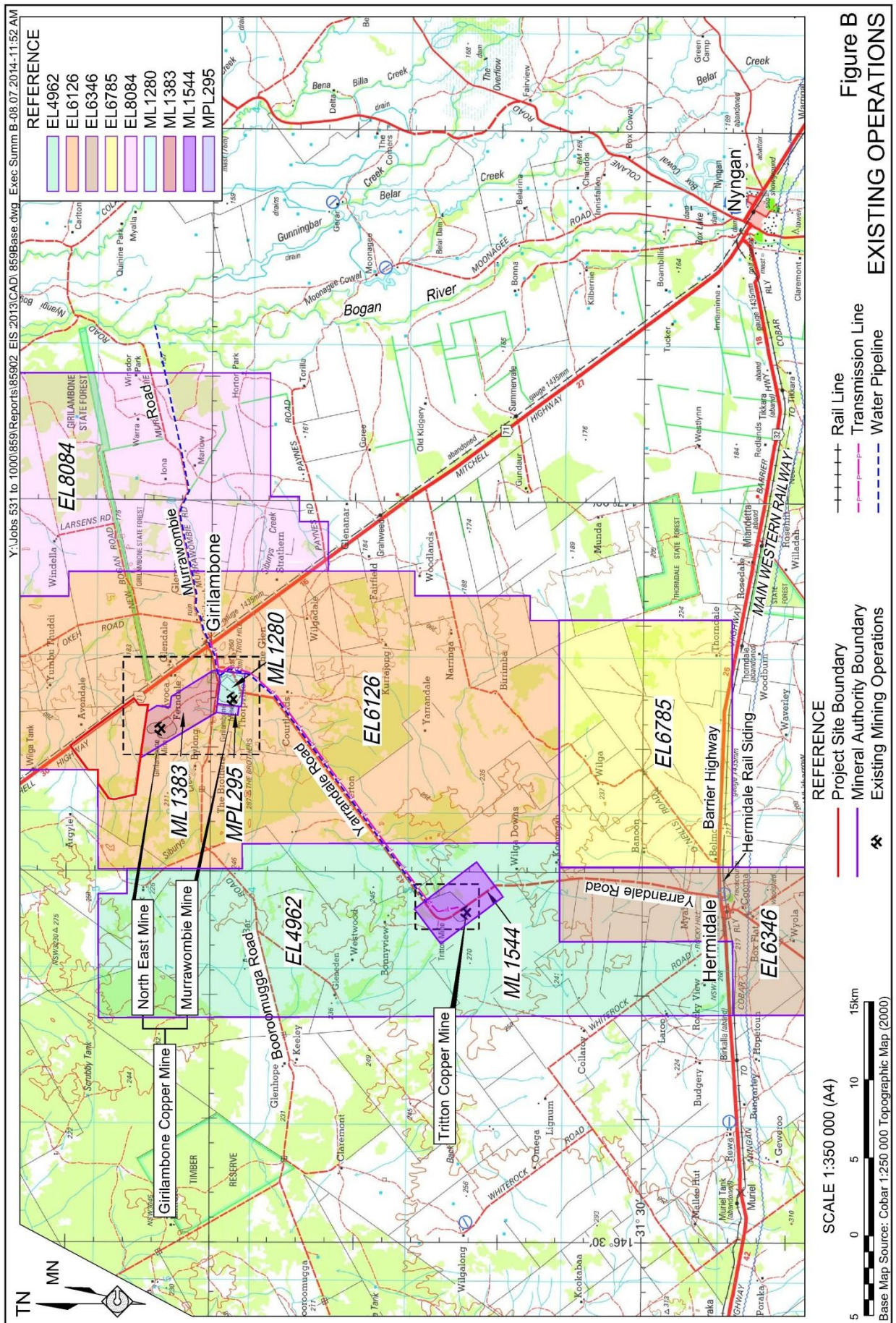
- An Environment Protection Licence (EPL) issued by the Environment Protection Authority (EPA) under Section 47 of the *Protection of the Environment Operations Act 1997*.
- A Mining Lease issued by the Division of Resources and Energy (DRE) under the *Mining Act 1992* for the area nominated.
- A range of Approval's issued by the NSW Office of Water (NOW) under Sections 89, 90 and 91 of the *Water Management Act 2000* for water intersected by the proposed underground mine.

## BACKGROUND

The copper deposits in the vicinity of the Project Site were first discovered in 1879, with mining commencing at the Girilambone Copper Deposit in 1881. In the early 1990's modern mining activities included the establishment of an open cut mining operation, the Murrawombie Mine, with ore processed using conventional heap leach methodology using sulphuric acid (**Figure B**).

The operator at that time, the Girilambone Copper Company (GCC), was the product of a Joint Venture between the Applicant (60%) and Nord Pacific Ltd (40%). GCC commenced open cut mining at the Murrawombie Open Cut in 1992. The operation was placed on care and maintenance in 2008.





The North East Mine, comprising the Hartmans, Larsens and North East Open Cuts, is located approximately 2km to the south of the Project Site and 4km northwest of the Murrawombie Mine (**Figure B**). Mining of the three open cuts was completed by GCC prior to the Applicant assuming control of the company in 2005.

In addition, the Applicant also operates the Tritton Copper Mine located approximately 24km to the southwest of the Project Site (**Figure B**). Operations at the Tritton Copper Mine commenced in 2000 and are ongoing.

Following exploration operations within the Project Site, it was determined that the mineralisation and supporting resource calculations would permit an economically viable mining operation, resulting in the Proposal as described within this document.

## PROPOSAL DESCRIPTION

### Overview

**Figure C** displays the principal components of the Avoca Tank Project which involves the following.

- Construction and use of a box cut, portal, decline, underground workings and two ventilation rises (one equipped as an emergency egress and the other with a ventilation fan at surface).
- Extraction of the economically recoverable copper-gold-silver resources to a depth of approximately 500m below surface using bench stoping and long hole open stope mining techniques.
- Transportation of ore material to the Tritton Copper Mine for processing using road registered road trains via a combination of a private haul road and Booramugga and Yarrandale Roads.

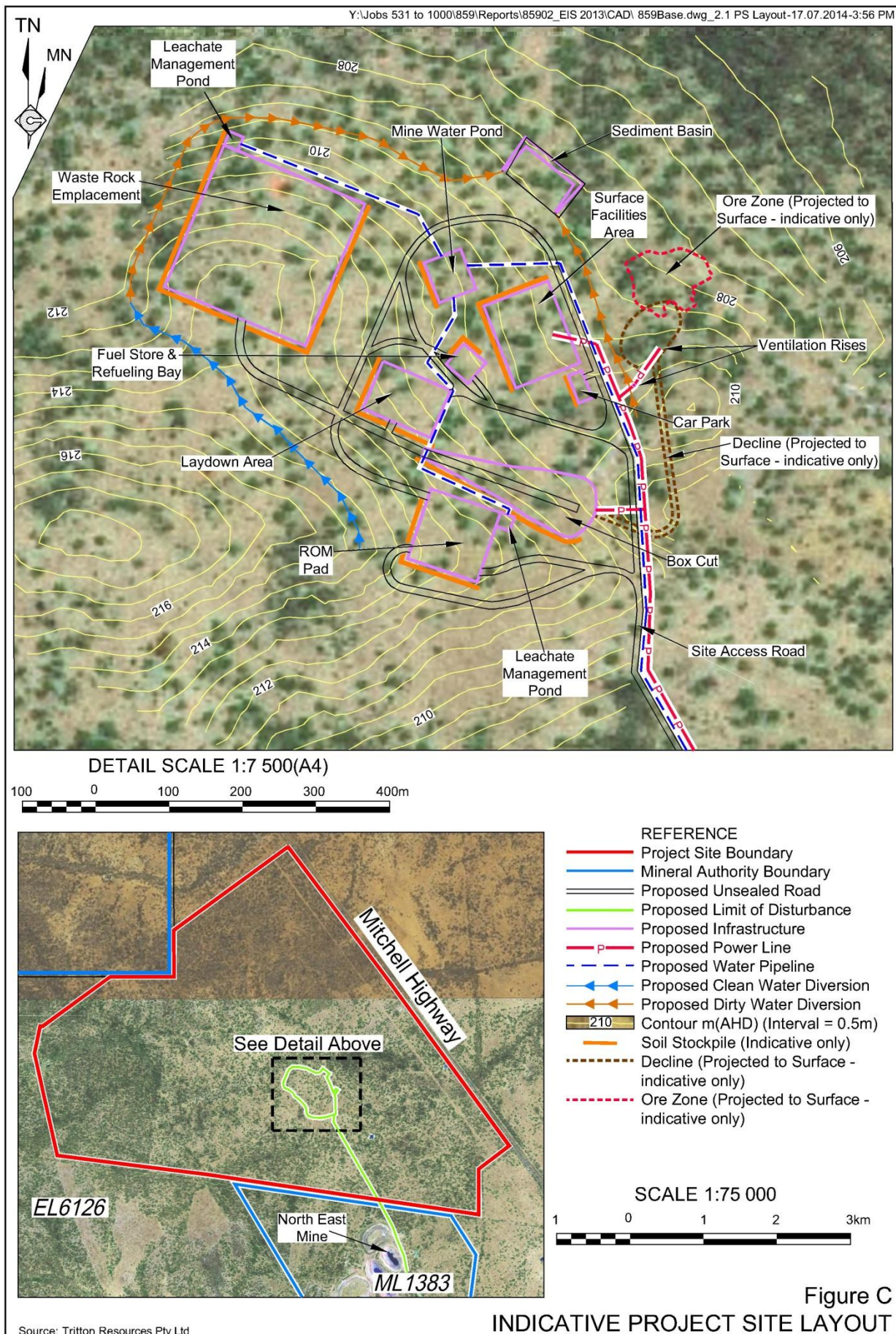
- Establishment of a surface waste rock emplacement for storage of waste rock extracted during construction of the box cut and initial sections of the decline and mine workings.
- Establishment of surface infrastructure, including a mine water pond, run-of-mine (ROM) Pad, laydown area, fuel store and refuelling bay and a hardstand area comprising a workshop, mobile plant parking area, wash down bay and transportable offices, crib room and ablution facilities.
- Extension of infrastructure from the North East Open Cut, including a site access road, water pipeline and electricity transmission line.
- Establishment of ancillary infrastructure.
- Construction and rehabilitation of a final landform that would be geotechnically stable and suitable for a final land use of intermittent grazing and nature conservation.

### Site Establishment and Construction Phase

The Applicant would commence the following key site establishment and construction activities following receipt of development consent and other necessary approvals, licences and leases.

- Construction of the Site Access Road from the existing Girilambone Copper Mine and all other required internal roads.
- Construction of key site water management structures including clean and dirty water diversion channels, the Mine Water Pond, Sediment Basin and leachate management ponds.





- Excavation of the box cut using bulldozers, blasting (as required) and load and haul techniques and placement of that material within the waste rock emplacement.
- Construction of the underground portal from the completed box cut, including the entrance to the decline and associated underground infrastructure, namely power, ventilation, water supply and safety equipment.
- Construction of the underground decline using conventional drill and blast techniques, with fragmented material transported to the surface.

### **Mining and Backfill Operations**

Underground mining operations would utilise open stope mining techniques to extract the ore from the elongate vertical lenses. The ore and associated waste rock would be transported to the surface ROM Pad using conventional underground haul vehicles. Backfilling of underground voids with waste rock would be undertaken to provide for local mine stability and to allow the potential extraction of higher grade resources in localised areas. The Applicant estimates that approximately 25% of the stopes that would be created would be backfilled. The backfilling would utilise material from concurrent operations within the mine, or from material transported from the surface waste rock emplacement.

### **Transport and Processing Operations**

Ore material placed on the ROM Pad would be loaded into two-trailer road trains (approximate 52t capacity) and transported to the Tritton Copper Mine for processing (see **Figure A**) via:

- the proposed Site Access Road;

- the existing private haul road between the North East Open Cut and Murrawombie operations; and
- Booramugga and Yarrandale Roads.

Processing would be undertaken at the existing Tritton Copper Mine processing plant under the existing Development Consent. Processed concentrate would then be transported to the Applicant's Hermidale siding for rail transport to local or international markets.

### **Hours of Operation**

Vegetation clearing, topsoil stripping and rehabilitation operations would occur during daylight hours, seven days per week.

The remaining operations including site establishment, underground mining, ore transportation and maintenance operations would occur 24 hours per day, seven days per week.

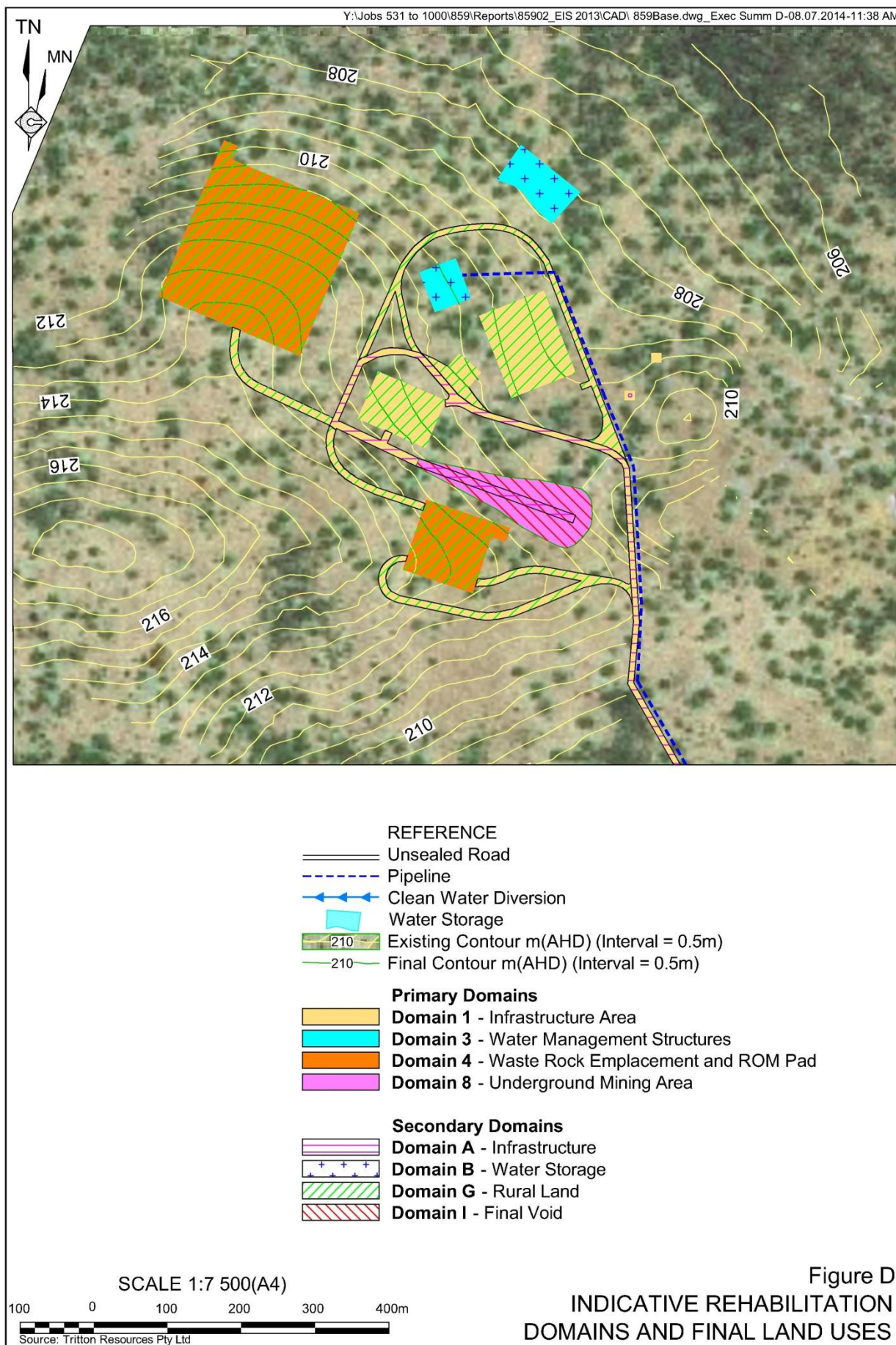
### **Rehabilitation and Final Landform**

**Figure D** presents the rehabilitation domains and indicative final landform for the Project Site, with all infrastructure, with the exception of water management structures (for ongoing rural use) and the Site Access Road removed.

## **ISSUE IDENTIFICATION AND PRIORITISATION**

In order to undertake a comprehensive *assessment* of the Proposal, appropriate emphasis needs to be placed on those issues likely to be of greatest significance to the local environment, neighbouring landowners and the wider community. These issues (and their potential impacts)







were identified through a program of community and government consultation, preliminary environmental studies and literature review. This was followed by an analysis of the risk posed by each potential impact in order to prioritise the assessment of the identified environmental issues within the *Environmental Impact Statement*.

### **Consultation**

Consultation with the local community involved:

- individual discussions with the landowners / residents of properties within and surrounding the Project Site; and
- the establishment and subsequent quarterly meetings of the Community Consultative Committee.

The Applicant and its consultants also regularly consulted with various government agencies and authorities throughout the planning phase of the Proposal.

### **Issue Prioritisation**

Considering the environmental issues raised throughout the consultation process, an analysis of environmental risk for each potential environmental issue, in the absence of any mitigation measures, was then completed. Through a review of the allocated risk ratings and the frequency with which each issue was identified, the relative priority of each issue was determined, with this priority used to provide an order of assessment and depth of coverage within the *Environmental Impact Statement*.

Based on the issues identified and the risk ratings allocated to the potential environmental impacts of these, the following order of priority of environmental issues has been determined.

- |                            |                                |
|----------------------------|--------------------------------|
| 1. Aboriginal Heritage.    | 8. Surface Water.              |
| 2. Ecology.                | 9. Traffic and Transportation. |
| 3. Groundwater.            | 10. Visual Amenity.            |
| 4. Noise.                  | 11. Bush Fire.                 |
| 5. Blasting and Vibration. | 12. Soil and Land Capability.  |
| 6. Historic Heritage.      | 13. Agriculture.               |
| 7. Air Quality.            | 14. Socio-Economic.            |

## **ENVIRONMENTAL FEATURES SAFEGUARDS AND IMPACTS**

The components and features of the existing environment within and surrounding the Project Site have been studied in detail and the Proposal designed to avoid or minimise impacts on that environment. A brief overview of the main components of the surrounding environment, the proposed safeguards and the assessed level of impact are set out in the following sections.

### **Aboriginal Heritage**

The Proposal has the potential to impact on Aboriginal sites as a consequence of surface disturbing activities. Following consultation with registered Aboriginal community stakeholders, two field surveys to identify the type and distribution of Aboriginal sites was undertaken in April and October 2012.

Five Aboriginal heritage sites were identified within the Project Site. In addition, it was determined that a number of previously identified and registered Aboriginal heritage sites had been recorded in incorrect locations. One of these

erroneously registered sites was identified as occurring in close proximity to the Site Access Road. In order to avoid doubt, the Site Access Road was slightly realigned to avoid any potential interactions with the registered site, irrespective of whether artefacts occur within the site or not.

In order to ensure in situ protection of all identified Aboriginal sites, the Applicant would erect a fence with an appropriate buffer around each Aboriginal site and prohibit entry to non-authorised personnel to prevent any potential damage to the sites.

## Ecology

The ecology assessment identified four vegetation communities and a total of 127 flora and 114 fauna species within the Project Site during surveys undertaken throughout 2012.

Of the flora species, namely the Cobar Greenhood Orchid, listed as vulnerable under both the *Threatened Species Conservation Act 1995* (TSC Act) and *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act), was recorded.

Each of the identified vegetation communities is a non-endangered community.

Eight fauna species listed as vulnerable under either the TSC Act or EPBC Act, or migratory under the EPBC Act, were identified during the field surveys.

The Proposal would result in the clearing of approximately 34ha of a non-endangered vegetation community, equating to approximately 2% of the Project Site vegetation. As a result of this, it was determined that a Biodiversity Offset is not required for the Proposal, due to the general principles of 'avoid and minimise' having been adopted in relation to the design of the Proposal. In addition, tests of significance

were undertaken for all species listed under the TSC Act or EPBC Act either identified or having the potential to occur within the Project Site. Those assessments determined that there would be no significant impact on any of the identified species.

## Groundwater

Groundwater in the vicinity of the Project Site is hosted by the Lachlan Fold Belt Murray-Darling Basin fractured rock groundwater source and is generally of poor quality, with electrical conductivities between 20 000µS/cm and 24 000µS/cm.

Within the Project Site, standing water levels in monitoring bores are between 30m and 40m below surface. The closest bore that intersects the fractured rock aquifer that is licenced for stock use is located approximately 15km to the east of the Project Site.

The Applicant determined the measured groundwater inflow to the Tritton Copper Mine over three years to be approximately 111ML/yr. Inflows to the North East and Murrawombie Mines were estimated to be 104ML/yr and 130ML/yr.

Anticipated groundwater inflows to the proposed mine were estimated semi-quantitatively using two equation-based methodologies, with inflows of between 392ML/yr and 567ML/yr predicted. Similarly, the extent of groundwater drawdown was estimated to be between 20.4km and 94.5km from the proposed mine.

It is noted, however, that these estimates are likely to significantly overestimate the actual impacts. As a result, the anticipated groundwater inflows to the proposed mine are expected to increase from nil initially to a rate similar to that observed at the Tritton Copper Mine, namely approximately 111ML/yr at the end of the life of the Proposal. Similarly, the extent of



groundwater drawdown is expected to be limited to significantly less than the identified 20.4km

## **Noise**

The sources of noise around the Project Site are typical of a rural environment with contributions from farming activities, insect noise, livestock, wind through vegetation and vehicles on local roads.

The criteria for noise generated by the Proposal are the default *Industrial Noise Policy* criteria as follows.

- Site establishment and mining operations – 35dB(A) ( $L_{Aeq(15min)}$ ).
- Night-time sleep disturbance – 45dB(A) ( $L_{Amax}$ ).
- Road traffic noise - 55dB(A) (daytime) and 50dB(A) (night-time) ( $L_{Aeq(1hr)}$ ).

Noise modelling undertaken as part of the noise impact assessment confirmed that all privately-owned residences would comply with the relevant criteria throughout all phases of the Proposal.

## **Blasting and Vibration**

The criterion for blasting and vibration would be as follows.

- Air blast overpressure – 115dB(L).
- Ground vibration – 5mm/s Peak Particle Velocity (PPV).

A blasting assessment was undertaken using a highly conservative Maximum Instantaneous Charge of 1000kg. The results of the assessment confirmed compliance with the criteria at all surrounding privately-owned residences.

## **Historic Heritage**

A non-Aboriginal heritage survey was undertaken concurrently with the Aboriginal heritage field survey. Three historic heritage sites were identified as occurring within the Project Site.

The sites would be left in situ with protection fencing provided, with no disturbances predicted to the sites from proposal-related activities.

## **Air Quality**

Due to the nature of the proposed activities and the proposed management measures and based upon dust monitoring at the Applicant's existing mining operations, the potential impact on air quality at surrounding privately-owned residences would be negligible.

## **Surface Water**

Surface water within the Project Site is typically only present immediately following substantial rainfall. Surface water flow is anticipated to be primarily sheet flow and is likely to have elevated suspended sediment loads.

Rainfall within undisturbed sections of the Project Site (clean water) would be diverted around the proposed areas of disturbance. Rainfall within disturbed sections of the Project Site would be captured (dirty water) within the water management system and utilised for mining or dust suppression purposes. Contaminated water, or water potentially laden with salt, chemicals or hydrocarbons, would be retained and used for mining-related purposes or pumped back to the North East Open Cut and would not be permitted to flow off site.

Make up water used for the Proposal (that is not sourced preferentially from the Site's water management system) would be

sourced from the Applicant's existing licenced water supply at the Girilambone Copper Mine. In light of the above, there would be no significant surface water-related impacts.

## **Traffic and Transportation**

The Applicant proposes to construct a Site Access Road from its existing Girilambone Copper Mine, to permit access to the Applicants internal road network and ultimately the public Booramugga and Yarrandale Roads. Those roads would be utilised to transport ore from the Proposal's ROM Pad to the processing plant at the Tritton Copper Mine using road-registered two trailer road-trains.

The Proposal would result in approximately 50 road-train movements per day. These movements would essentially replace existing ore transportation movements associated with the Applicant's Girilambone Copper Mine. As a result, no adverse traffic and transportation impacts are anticipated.

## **Visual Amenity**

The existing visual amenity surrounding the Project Site is typical of rural areas with views of native vegetation, cleared areas and intermittent agricultural and mining operations.

Activities within the Project Site would not be visible from surrounding residences and publically accessible vantage points.

## **Bush Fire**

Taking into account the vegetation, slopes within the Project Site and the size of cleared areas around proposed infrastructure, a bush fire hazard assessment determined that the Proposal is classified as

a medium category of bush fire attack, consistent with 'Category 1 bush fire prone land', as identified in the Bogan LEP.

Following the implementation of the proposed management measures, it was determined that the Proposal would not present a risk or be at risk from a significant bush fire-related attack.

## **Soil and Land Capability**

The stripping, handling and storage of soils within the Project Site would be undertaken in a manner that would ensure that the soils are available for rehabilitation activities to permit the proposed future land use of the Project Site, namely continued intermittent agricultural use.

## **Agriculture**

Cleared land within the Project Site has been previously used for intermittent sheep and cattle grazing. However, agricultural activities have not been undertaken within the Project Site since at least to 2004.

Taking into account the limited agricultural activities within and surrounding the Project Site, and the fact that the Proposal would result in limited disturbance, either directly or indirectly, the proposed activities are likely to have no or negligible adverse impacts on agricultural activities in the vicinity of the Project Site.

## **Socio-Economic**

The Proposal would result in a range of socio-economic benefits to the community surrounding the Project Site. These benefits would include the following.

- Continued employment for approximately 318 persons, of which more than half would continue to reside



within the Bogan Local Government Area with a large proportion of the remainder residing in surrounding areas.

- Continued contribution to the local, Regional, State and National economies, including contributions of approximately \$15.8M and \$10M annually within the Bogan LGA through wages and salaries and purchase of goods and services respectively, with additional indirect contributions.
- Continued support for local community organisations and services.

Assessment of the potential socio-economic impacts demonstrates the beneficial impacts of the Project far outweigh any minor adverse impacts associated with the operations.

## **PROPOSAL EVALUATION AND JUSTIFICATION**

The Avoca Tank Project has been evaluated and justified principally through consideration of its potential impacts on the environment and potential benefits to the local and wider community.

An evaluation of the Proposal has been undertaken by firstly re-assessing the risks posed to the local environment by Proposal-related activities following the implementation of all operational controls, safeguards and/or mitigation measures, and secondly through consideration of the principles of ecologically sustainable development. This evaluation has found that, with the implementation of the proposed operational controls, safeguards and/or mitigation measures, the residual risk posed by each potential environmental impact has been reduced to either moderate or low, and therefore acceptable. Further, the design of the Proposal has addressed

each of the sustainable development principles, and on balance, it is concluded that the Proposal achieves a sustainable outcome for the local and wider environment.

The Proposal and associated activities have been assessed in terms of a wide range of biophysical, social and economic issues. Potential residual impacts can be justified in terms of the positive economic and social benefits to the local surrounding towns, villages and regional centres, Bogan LGA, NSW and Australia, the market opportunities for copper exports and the principles of ecologically sustainable development.

## **CONCLUSION**

The Proposal has been, to the extent feasible, designed to address all issues raised by the local community and all levels of government, as well as the principles of ecologically sustainable development. The Proposal provides for the development, mining and transportation of copper/gold/silver ore for processing at the Applicant's existing Tritton Copper Mine, which would continue to be significant in generating further employment opportunities and maintaining stimulus to the local economies. The post-mining landform would also provide for the re-establishment of intermittent agricultural activities.

In light of the conclusions included throughout the *Environmental Impact Statement*, it is assessed that the Proposal could be constructed and operated in a manner that would satisfy all relevant statutory goals and criteria, environmental objectives and reasonable community expectations.

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