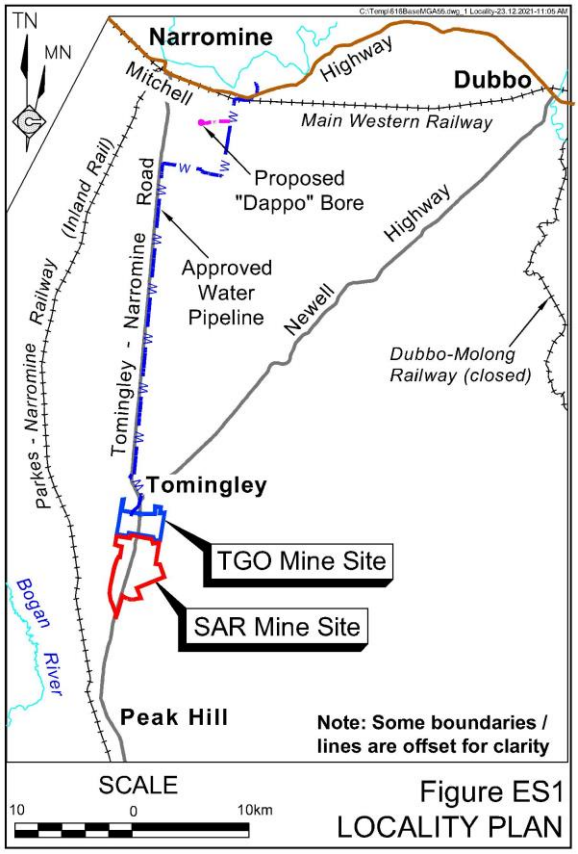
Executive Summary

Introduction

Tomingley Gold Operations Pty Ltd (The Applicant) proposes to extend the existing Tomingley Gold Operations Gold Mine (the TGO Mine) located immediately to the south of Tomingley village in central western NSW (the TGO Mine Site) to incorporate mining of the San Antonio and Roswell (SAR) deposits (**Figure ES1**). The proposed activities are referred to as the Tomingley Gold Extension Project or the Project. Development consent is sought for:

- all currently approved activities associated with the TGO Mine; and
- those activities required for the mining of the SAR deposits.



The Project would comprise the following core components (**Figure ES2**).

- The realignment the Newell Highway and Kyalite Road, including the intersections of the Newell Highway and Kyalite Road, McNivens Lane and Back Tomingley West Road.
- Surface and underground mining operations within the SAR Mine Site, including the delivery of waste rock and ore to the TGO Mine Site for disposal, stockpiling and/or processing.
- Continued operation of the TGO Mine beyond the approved end of mine life on 31 December 2025, including construction and use of:
  - Stages 3 to 9 of Residue Storage Facility 2;
  - a SAG Mill and associated modification to the crushing circuit within the TGO Processing Plant; and
  - use of the Caloma 1 and 2 Open Cuts for in-pit placement of waste rock.
- The connection of an existing bore field to the Applicant's existing and approved water supply pipeline that runs from Narromine to the TGO Mine Site.

It is proposed that a total of approximately 14.8 million tonnes (Mt) of ore would be produced by the Project and processed on site to produce approximately 765 000oz of gold during the life of the Project. Approximately 144Mt of waste rock would be extracted.

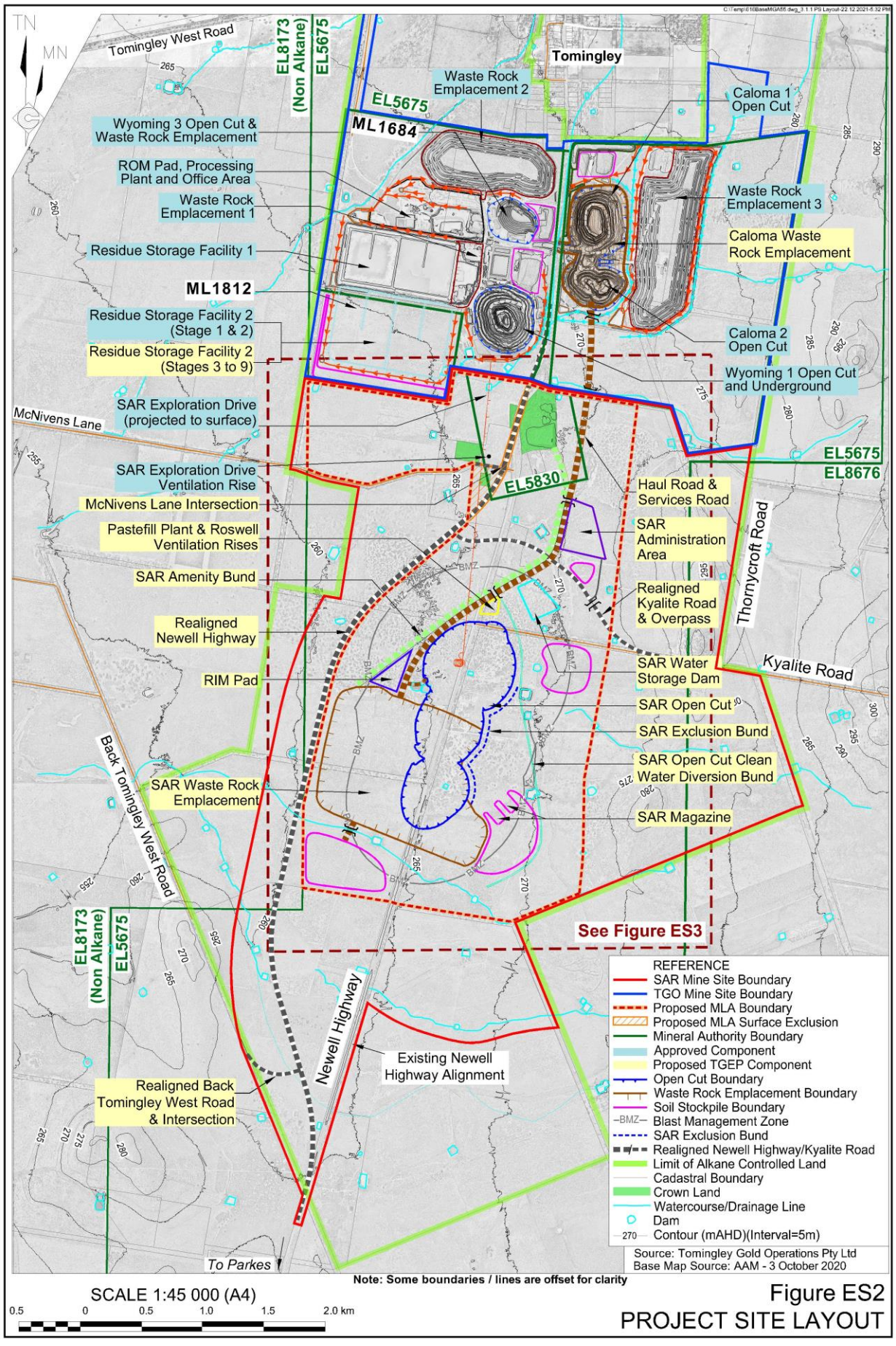


Figure ES2
PROJECT SITE LAYOUT

The EIS prepared to support the application has been prepared in accordance with the:

- EIS Guidelines dated July 2021;
- Secretary's Environmental Assessment Requirements dated 22 November 2021 and requirements of other relevant government agencies; and
- conditional Gateway Certificate issued on 15 November 2021.

The Applicant

The Applicant, Tomingley Gold Operations Pty Ltd, is the operator of the TGO Mine and is a subsidiary company of Alkane Resources Ltd (Alkane). Alkane is an Australian, publicly listed mining and exploration company which has been in existence since 1969. Alkane developed and is currently overseeing the operation of the TGO Mine. Alkane also developed and operated the Peak Hill Gold Mine on the outskirts of Peak Hill (**Figure ES1**) from 1996 to 2005 and has now largely rehabilitated that mine site. Alkane also discovered the Dubbo Project and McPhillamys Gold Project, both of which are being developed by others.

The Objectives of the Project

Consistent with the objectives of the approved TGO Mine, the objectives of the Project would be as follows.

- To safely and economically mine the identified gold reserves.
- To operate the Project in a manner that would minimise surface disturbance and impacts on surrounding residents and the local environment.
- To comply with statutory requirements, appropriate environmental criteria and reasonable community expectations.
- To create a final landform that is suitable for a post-mining land use of agriculture and nature conservation, as well as other alternate uses, pending receipt of further development consent.
- To continue to maintain an open and honest relationship with and to work cooperatively with the surrounding community.
- To achieve the above objectives in a cost-effective manner to ensure security of employment of employees and contractors and the continued economic viability of the Applicant, its suppliers and partners.

Strategic and Statutory Context

State and Local Planning Context

The *Environmental Planning and Assessment Act 1979* (EP&A Act) provides the framework for the assessment and determination of development applications in NSW. As the capital investment value for the Project would exceed the $30 million threshold under Clause 8 of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011*, the Project is classified as State Significant Development and this development application is made under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979*.

The Project has been designed with recognition of a number of relevant State planning instruments and regional strategic documents as well as the requirements of the *Narromine Shire Local Environmental Plan (LEP) 2011*.

The Narromine LEP identifies that the Project Site is primarily located within land zoned RU1 – Primary Production as well as land zoned as SP2 – Infrastructure. Mining is permissible with consent within these zones.

It is considered that the Project would be consistent with the objectives and requirements of the EP&A Act, Narromine LEP, other regional strategic and planning documents and State and Commonwealth legislation.

Approvals Required

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

- An Environment Protection Licence under the *Protection of the Environment Operations Act 1997*.
- A Mining Lease under the *Mining Act 1992*.
- Water Access Licences for the extraction of groundwater under the relevant water sharing plans and the *Water Management Act 2000*.
- Permits under the *Roads Act 1993* to undertake the proposed relocation and intersection upgrade works.
- Appropriate approvals and licences from SafeWork NSW for the on-site storage and use of explosives and other reagents and chemicals.

Other Agreements

The Project has or would require the following agreements in order to proceed as proposed.

- A Planning Agreement with Narromine Shire Council. The Applicant is currently negotiating with Council to extend the existing TGO Planning Agreement to cover the Project.
- The Applicant has signed Memoranda of Understanding with 18 residents within Tomingley village. Additional Memoranda would be negotiated with the owners of selected residences as required.

Project Background

Gold was first discovered in the local area in 1879 with the Tomingley Goldfield proclaimed on 19 June 1882 and Tomingley village proclaimed on 15 June 1894. The most significant of the local workings was the Myall United Gold Mine (later referred to as the McPhail Mine) and associated village of Myall (also known as McPhail) (**Figure ES2**). Mining ceased at the McPhail mine by 1913, with subsequent re-treatment of the tailings occurring in the 1920's and again in the late 1990s.

In 2001, the Applicant entered into an agreement with Compass Resources NL in relation to EL 5675 and Golden Cross NL in relation to EL 5830 to earn 100% of both tenements (**Figure ES2**). The Applicant identified the Wyoming 1 deposit in 2001, the Wyoming 3 deposit in 2002, the Caloma 1 deposit in 2006 and the Caloma 2 deposit in 2010. Project Approval MP 09_0155 for the TGO Mine was granted on 24 July 2012 and the Project was transitioned to a State Significant Development on 31 August 2018.

Gold deposits within the Project Site are interpreted as orogenic gold systems positioned within a major north-south orientated structural zone. In addition to the TGO and SAR Deposits, a number of exploration targets exist within the Project Site and the Applicant's Exploration Licence package. These prospects will be the subject of further exploration drilling over the life of the Project and may be the subject of subsequent applications for development consent should that exploration prove successful.

The Applicant has completed a number of Joint Ore Reserve Committee (JORC) compliant resources and reserves statements for TGO and SAR. In summary, the estimated

mineral resources for the TGO and SAR Deposits is approximately 1.6 million ounces of gold.

Project Description

Overview

Figures ES2 and **ES3** displays the indicative Project Site layout which includes the following principal components.

- The realigned Newell Highway, Kyalite Road and associated intersections.
- The SAR Open Cut, consisting of the North, Central and South Pits.
- The SAR Waste Rock Emplacement, with a geomorphic design with slopes of 1:6 (V:H) or less and a maximum height of approximately 70m.
- The Caloma Waste Rock Emplacement which would backfill the existing Caloma 1 and 2 Open Cuts.
- Residue Storage Facility 2 which would be increased in capacity from the currently approved Stage 2 to Stage 9.
- The SAR Administration Area consisting of administration and workshop infrastructure and services/
- The SAR Amenity Bund, Haul Road and Services Road, SAR Pastefill Plant and Roswell Ventilation Rise and SAR Water Storage Dam.

The above components would be supported by a range of on-site and off-site infrastructure. The on-site infrastructure would comprise haul roads, water management structures, power/water reticulation, workshops, stores, compounds and offices/amenities. The off-site infrastructure would comprise relocated power and telecommunications infrastructure and the addition of an existing bore field to the Applicant's water supply pipeline for the delivery of water to the TGO Mine Site.

Site Establishment and Construction Stage

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

Off-site Road Network

The realigned Newell Highway and Kyalite Road would be constructed off-line during the initial stages of the site establishment and construction stage. The key activities that would be undertaken during this period would include the following.

- Construction of temporary works depots, including a temporary intersection on the Newell Highway
- Construction of the relocated Newell Highway and associated intersections.
- Construction of the relocated Kyalite Road, including an overpass over Kyalite Road Overpass.

SAR Mine Site

Site establishment and construction activities within the SAR Mine Site would include but not be limited to the following.

- Installation of environmental controls, vegetation clearing and soil stripping.
- Pre-strip waste rock from the SAR Open Cut to provide materials for site civil works and permit early access to the ore.
- Civil works to allow for the construction of the SAR Administration Area, Pastefill Plant, SAR Amenity Bund, Haul Road and Services Road and the initial embankment of the SAR Waste Rock Emplacement.
- Construction of various site infrastructure, including water management infrastructure.

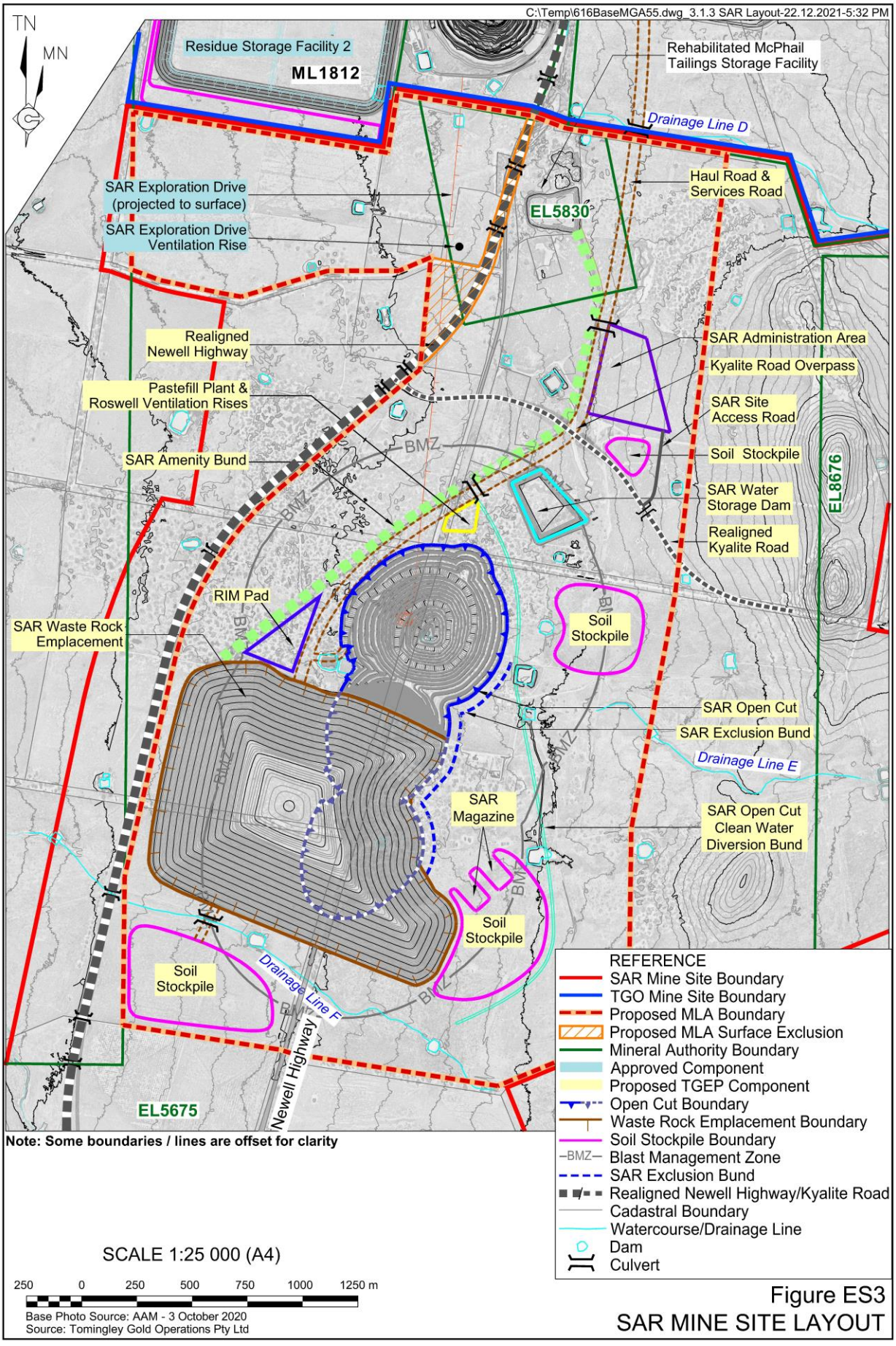


Figure ES3
SAR MINE SITE LAYOUT

Water Supply Bore and Pipeline

The Applicant would construct a replacement bore and water supply pipeline on the "Dappo" property to connect to the existing approved water supply pipeline. The additional bore and pipeline would provide additional raw water for mining-related purposes.

Realigned Public Roads

The current alignment of sections of the Newell Highway and Kyalite Road are within the proposed SAR Open Cut (**Figure ES2**). The Applicant proposes to realign the Newell Highway and Kyalite Road to ensure that the realigned roads are outside the blast management zone for the SAR Open Cut and therefore do not need to be closed during surface blasting operations. The design of the realigned roads would be in accordance with the *Austroads Guide to Road Design* and has been the subject of extensive consultation with Transport for NSW and Narromine Shire Council.

The realigned Newell Highway would comprise the following.

- Signposted speed limit of 110km/h.
- One overtaking lane of 1 500m length in each direction.
- All intersections channelised.
- Flood protection greater than 1% Annual Exceedance Probability (or 1 in 100 years).

The realigned Kyalite Road would comprise the following.

- Signposted speed limit of 100km/h.
- An overpass over the proposed Haul Road and Service Road suitable for a b-triple truck.
- Sealed from the Newell Highway to 30m east of the intersection with the SAR Site Access Road. Unsealed east of that point.

Mining Operations

Open Cut Mining Operations

Following removal of vegetation and soil materials, mining would commence with the removal of any friable weathered materials. These materials would be directly extracted using an excavator or ripped and pushed up using a bulldozer and loaded into haul trucks using an excavator or front-end loader or using scrapers. Extracted waste rock and ore would be transported to the active Waste Rock Emplacements, low grade ore stockpile, ROM Pad or other locations where waste rock is being used for construction of infrastructure.

Following removal of the friable weathered materials, the bulk of the ore and waste rock would require blasting.

Underground Mining Operations

Underground mining operations associated with the Wyoming 1 and Caloma 1 and 2 deposits within the TGO Mine Site would continue as currently approved.

Access to the SAR Underground Mine would be via the existing and approved SAR Exploration Drive, which runs south from the Wyoming 1 Underground Mine towards the SAR Deposits (**Figures ES2** and **ES3**). A portal may be established in the SAR Open Cut late in the life of the Project once open cut mining operations are complete.

Underground mining would, consistent with the TGO Mine, utilise long hole open stoping method, or similar. No surface subsidence would occur within the SAR Mine Site, with the exception of potential breakthrough of the underground workings into the base of the proposed SAR Open Cut North Pit.

Surface infrastructure to support the SAR Underground Mine would include the approved SAR Exploration Drive and proposed Roswell Ventilation Rises and the SAR Pastefill Plant (**Figures ES2** and **ES3**). Residue for the pastefill plant would be

sourced from the Residue Storage Facilities and transported to the SAR Mine Site by truck or pumped as a slurry.

Waste Rock Management

Material containing insufficient quantities of gold to justify processing would be managed as waste rock. Approximately 144Mt of waste rock would be produced over the life of the Project, with a maximum annual production of 32.1Mt in Financial Year 2025.

A geochemical assessment of waste to be produced throughout the life of the Project identifies that the vast majority of water rock is non-acid forming. Any potentially acid forming waste rock material would be placed within the in-pit Waste Rock Emplacements.

Initially, waste rock would be used to construct site infrastructure, including but not limited to the SAR Amenity Bund, Haul Road, Services Road and the SAR Water Storage Dam.

Following completion of the site establishment activities, waste rock would be placed within the Caloma or SAR Waste Rock Emplacements.

The Caloma Waste Rock Emplacement would completely backfill the Caloma 1 and 2 Open Cuts to surface (**Figure ES2**).

The SAR Waste Rock Emplacement would backfill the SAR Open Cut South and Central Pits, with the out-of-pit component established with side slopes of 1:6 (V:H) or less and a maximum height of 70m (**Figure ES3**). The outer sections of each lift of the SAR Waste Rock Emplacement would be constructed, shaped and rehabilitated initially as an amenity bund, with subsequent waste rock placement occurring behind the outer amenity bund.

Processing Operations

Processing operations would be undertaken using the existing, approved Processing Plant.

The Applicant proposes to install a Semi-autogenous Grinding (SAG) Mill adjacent to the existing Ball Mill, as well as other minor adjustments to the crushing circuit, to enable the processing of lower-grade ores and to increase the maximum total throughput from the existing and approved 1.5Mtpa to 1.75Mtpa.

The Project would produce and process approximately 14.8Mt of ore and 1.6Mt of low grade over the life of the Project, with the maximum annual rate of processing being 1.75Mt.

Residue Management

The Applicant would continue to use the existing and approved Residue Storage Facility 1 and would construct the approved Residue Storage Facility 2 to Stage 2.

Development consent is sought to construct Stages 3 to 9 of Residue Storage Facility 2. The additional stages would increase the maximum elevation of Residue Storage Facility 2 from 272m AHD to 286m AHD, 0.5m lower than the maximum elevation of Residue Storage Facility 1. The capacity of the Facility would increase from approximately 7.4Mt to 15Mt.

Water Management Strategy

The Applicant would continue to operate the existing TGO water management infrastructure for the life of the Project.

A range of water management infrastructure would be constructed within the SAR Mine Site as follows (**Figure ES3**).

- SAR Water Storage Dam to contain sediment-laden (dirty) and salt-laden (mine) water for reuse for construction and mining-related purposes.
- SAR Open Cut and SAR Administration Area Clean Water Diversions to divert water from undisturbed sections of the SAR Mine Site around active mining areas.

- Sediment Basins to contain dirty water for pumping to the SAR Water Storage Dam to prevent off-site discharge of polluted water.

The Applicant would ensure that all dirty, mine and process (chemical-laden) water would be retained on site.

The water balance for the Project identifies that the existing TGO water supply is adequate for the proposed mining operations under average rainfall conditions. However, under dry conditions or in the event that groundwater inflows are less than anticipated, additional water supply may be required.

As a result, the Applicant proposes to replace an existing bore on the "Dappo" property, located approximately 5km to the southeast of Narromine (**Figure ES1**). The Applicant would subdivide the existing Water Access Licence for that bore and would purchase 400ML of that allocation. A pipeline would be constructed to link the proposed "Dappo" bore to the existing TGO water supply pipeline.

Transportation and Traffic

Access to the TGO Mine Site would continue to be via the existing TGO Site Access Road.

Access to the SAR Mine Site during site establishment and construction stage would be provided by temporary construction site access points on the Newell Highway and McNivens Land and Back Tomingley West Road.

Access to the SAR Mine Site during the operational phase of the Project would be via the SAR Site Access Road. The SAR Haul Road and Services Road would provide direct access between the SAR and TGO Mine Sites.

Construction-related traffic would be primarily restricted to the Newell Highway and short sections of Back Tomingley West Road and McNivens Lane and would include heavy vehicles transporting road construction materials to site.

Operational traffic would be primarily limited to light vehicles transporting personnel to and from the TGO and SAR Mine Sites via Tomingley West Road and Kyalite Road respectively.

Hours of Operation and Project Life

Table ES1 presents the proposed operating hours throughout the remainder of the Project life.

Table ES1
Hours of Operation

Activity	Days	Hours[1]
Construction and site preparation, including public road construction		
• Out of hours operations[2]	7 days	24hrs
• All other construction operations	Monday to Saturday[1]	7:00am to 10:00pm
Mining operations	7 days	24hrs
Waste rock management		
Processing operations		
Transportation operations		
Maintenance		
Rehabilitation operations		7:00am to 6:00pm

1 Public Holidays excluded.
2 As identified by the Interim Construction Noise Guideline and generally include less noise activities.

The TGO Mine is approved to continue until 21 December 2025. Based on the current known mineral resources, the Applicant anticipates that mining operations would continue until 31 December 2032. Rehabilitation operations would be expected to be completed by 31 December 2034.

Employment and Economic Contributions

The Applicant currently directly employs approximately 220 persons on a full-time equivalent basis. The Project is expected to increase this to approximately 363 persons in Financial Year 2025, plus contractors, with employment decreasing after that as production rates decrease.

The Project would generate the following economic contributions over the operational phase of the Project to 31 December 2032, of which the vast majority would be retained within the local and regional areas. This would further support the economy of Narromine, Dubbo Regional and Parkes Local Government Areas and ongoing employment of numerous, non-Mine personnel.

- Capital expenditure in NSW - $100.58 million.
- Operating expenditure in NSW - $432.31 million.
- NSW and Local government taxes, royalties and duties - $90.94 million.

Rehabilitation and Final Landform

Rehabilitation of all areas disturbed by mining-related activities would be an integral part of the Project. Emphasis would be placed upon progressively creating final landforms, wherever practicable, and re-establishing soil profiles and vegetation essential to achieving the preferred final land use(s) during and following the cessation of operations.

The nature of the Project dictates, that the disturbed areas associated with SAR Open Cut, processing area and Residue Storage Facility would remain active throughout the mine life and, as a consequence, the opportunity to undertake progressive rehabilitation of these components would be minimal.

Notwithstanding the above, the Applicant would undertake progressive rehabilitation of the outer face of the SAR Waste Rock Emplacement.

Figure ES4 presents the final landform and land uses across the Project Site at the end of the Project life. In summary, the final landform would comprise the following.

- Two bunded and fenced final voids.
- Three fully backfilled open cuts.
- Three shaped and rehabilitated waste rock emplacements.
- A capped, free-draining integrated Residue Storage Facility

All infrastructure not required for the final land use would be removed or reduced in area or width and would be shaped and revegetated as required. Realigned public roads would be retained.

The final land uses would include agriculture and nature conservation. The Applicant would actively investigate alternate final land uses including commercial, industrial or other uses that would continue to generate economic benefit following the life of the Project.

Consultation

Community consultation continues to be a critical component of the successful operation of the TGO Mine.

Consultation has been undertaken to inform the community and government agencies about the Project and to gain an understanding of the issues that need to be considered by the Applicant and addressed in the Environmental Impact Statement.

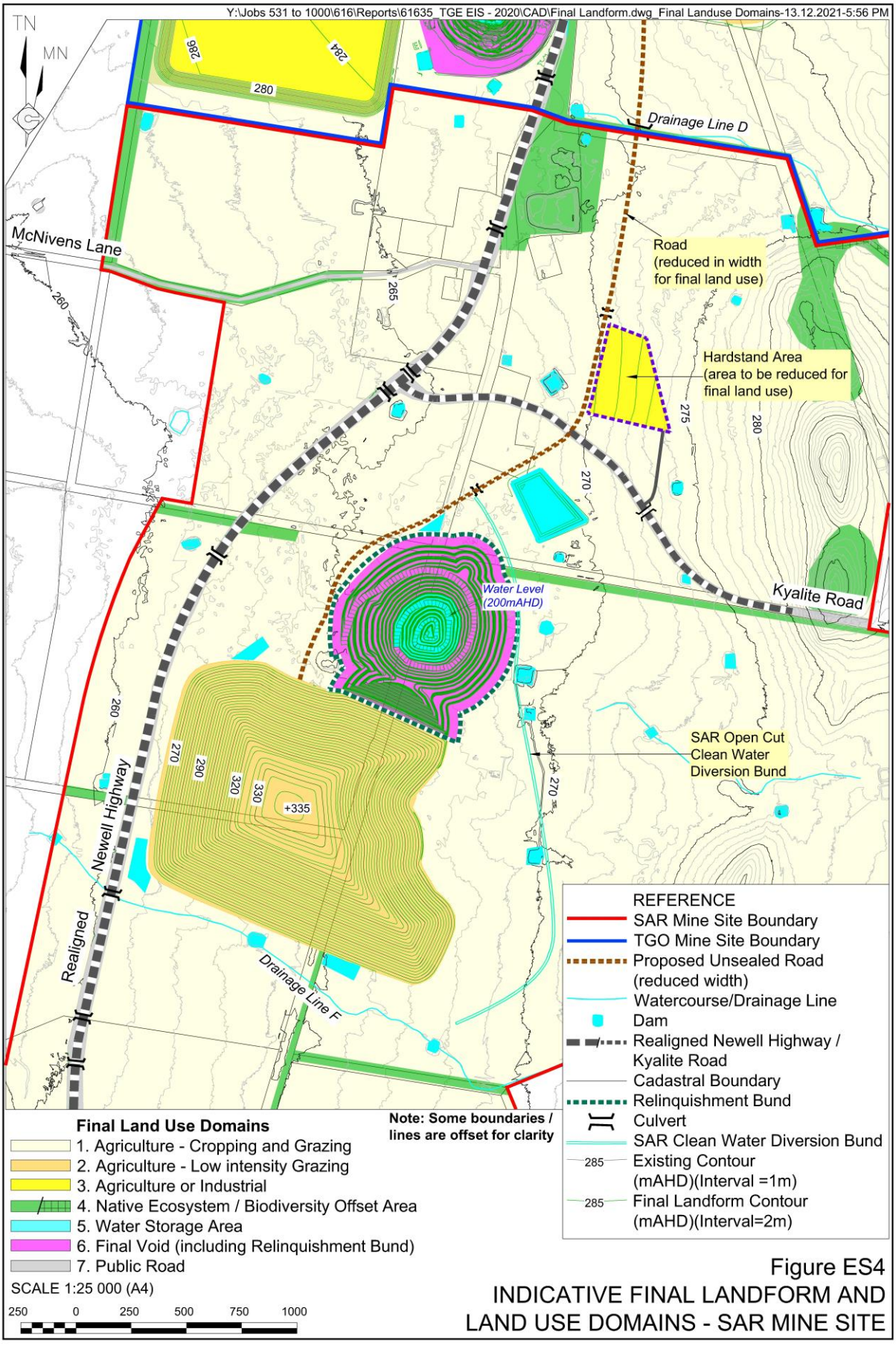


Figure ES4
INDICATIVE FINAL LANDFORM AND LAND USE DOMAINS - SAR MINE SITE

The Applicant has undertaken extensive community consultation throughout the design stages of the Project and during the environmental and social assessments for the *Environmental Impact Statement.* Consultation has been undertaken using a range of forums and formats including, but not limited to, a program of individual landowner consultation, distribution of newsletters / Project information sheets, maintaining Project information on the Applicants' website, a series of Community Information Days and a Community Consultative Committee (CCC).

Environmental features Safeguards and Impacts

The components and features of the existing environment within and in the vicinity of the Project Site have been studied in detail and used to inform the design of the Project to avoid or minimise potential impacts

The following provides a brief overview of the main components of the existing environment, the proposed safeguards to be implemented to minimise adverse effects and the assessed level of impact(s) arising from the Project.

Traffic and Transportation

The Project would involve significant changes to the layout of the local road network in the vicinity of the Project Site, resulting in minor increases in travel times for users of the Newell Highway and Kyalite Road. However, the proposed design of the realigned roads and associated intersections would significantly increase the safety and flood immunity of the local road network, providing long-term benefits to road users and the local community.

An *Integrated Transport Assessment* (Constructive Solutions, 2021b) was undertaken for the Project that considered traffic and transport related impacts associated with the construction and operation of the Project.

The principal Project-related traffic and transportation impacts would be associated with the realignment of the Newell Highway, Kyalite Road and associated intersections. As the proposed road designs are consistent with the *Austroads Guide to Road Design* and would be approved by the relevant roads authority, there would be no unacceptable road design or operational impacts.

Additional traffic generated by the Project would principally comprise light vehicles used to transport personnel to the Project Site. Heavy vehicles use of the public road network would not be a significant feature of the Project.

Notwithstanding the above, the Project would result in minor additional travel time for users of the Newell Highway and residents along Kyalite Road travelling to the south. This would, however, be offset by substantial safety and intersection improvements. As a result, on balance the Applicant contends that the Project would not result in unacceptable adverse traffic and transportation-related impacts.

Visibility

The development of the Project would result in changes in the visual landscape in the vicinity of the Project Site. However, the limited visibility of the mining activities within the Project Site and the range of visual controls would achieve an acceptable level of impact. The SAR Waste Rock Emplacement has been designed using geomorphic landform design principles to represent a natural landform which, while highly visible from most vantage points in the vicinity of the SAR Mine Site, would be actively and progressively rehabilitated over the life of the Project

The potential for lighting impacts on the local environment has been assessed to be negligible. In addition, the impacts of sky glow on the local environment were assessed to be insignificant.

The visibility assessment of the Project established that key infrastructure within the SAR Mine Site, namely the SAR Waste Rock Emplacement, would be highly visible from much of the area surrounding the Project Site, including from privately-owned land and residences, as well as for users of the local road network. Two principal matters relating to visibility impacts were addressed by the visibility assessment; driver distraction and impacts to existing visual amenity.

Users of the realigned Newell Highway and Kyalite Road would have views of the Project Site; however, direct views of the principal mining related activities within the Project Site would largely be reduced or prevented by the SAR Amenity Bund, the progressively rehabilitated outer face of the SAR Waste Rock Emplacement and both existing and proposed vegetation visibility screens.

The most visible feature of the Project would be the SAR Waste Rock Emplacement. Visual impacts would be managed through the progressive revegetation of the outer face of the emplacement. The geomorphic design of the SAR Waste Rock Emplacement would provide a natural looking feature in the landscape. Other visual controls would also assist to manage the visual impacts of the Project including the retention and establishment of tree screens adjacent to local roads.

A lighting and night glow assessment (LAS, 2021) determined that the Project would comply with the limits for dark rural environments and would not impact on the operation of the Siding Spring Observatory.

Noise and Blasting

During the initial two years of mining operations within the SAR Open Cut, minor exceedances of the Project Noise Trigger Levels of up to 2dB(A) could occur at approximately 22 privately-owned residences within Tomingley village. The Applicant has previously negotiated Memoranda of Understanding with 18 of those residents to install mitigation in each of the residences, including air conditioning (and payments for running costs), double glazing and insulation. The Applicant would offer similar mitigation to the four remaining residents who have not already received mitigation.

No Project-related road traffic noise or blasting-related impacts are predicted to occur.

The design of the Project, the selection of the type and number of mobile equipment used on site and operational hours have largely been influenced by the noise assessment for the Project. Key design features that have been refined through this process include the following.

- The construction of physical elements within the Project Site to reduce the propagation of noise, including the SAR Amenity Bund, the outer face of the SAR Waste Rock Emplacement and the construction of an acoustic barrier for the Haul Road within the TGO Mine Site.
- Land preparation activities, which may occur prior to the construction of landform noise mitigation elements, would be restricted to daytime operations when required.
- Installation of additional noise monitoring terminals that would monitor noise in real-time and enable the Applicant to actively manage noise emissions to ensure compliance at surrounding residences.

The noise assessment undertaken by MAC (2021) has concluded that Project-related noise levels experienced at surrounding residences would be low and would be mainly audible during periods of adverse weather conditions, i.e. gentle winds towards residences or evening or night-time temperature inversion.

The Applicant maintains several Memoranda of Understanding with surrounding Residences relating to potential noise impacts from approved operations within the existing TGO Mine Site. MAC (2021) has predicted that the Project Noise Trigger Levels would be exceeded at four private Residences during the evening and night with a negligible exceedance of 1dB(A) to 2dB(A) during the initial two years of mining operations within the SAR Open Cut only. Mitigation would be offered to each of the affected residents.

Overall, whilst noise from the Project Site activities would be periodically audible by local receptors, the magnitude of the noise would be at a level recognised by the EPA's policy as being acceptable to most people and unlikely to cause annoyance.

Road traffic noise levels would be less than the relevant assessment criteria.

Blasts would be designed to ensure that both ground vibration and airblast overpressure levels comply at all privately-owned Residences. Blasts would be periodically heard but their effects would be within both comfort and damage criteria.

Air Quality and Greenhouse Gas

Air quality modelling for the Project predicts that there would be no exceedance of annual average air quality criteria at any privately-owned residences as a result of the Project. However, modelling indicates that additional exceedances of the PM_{10} 24-hour average criterion of 50µg/m^3 are predicted. The Applicant proposes to implement a range of control measures, including installation of two additional real-time PM_{10} monitors that would permit active management of particulate emissions. Air quality modelling indicates that in all cases, with the exception of those days when the background 24-hour average dust level is greater than 47.5µg/m^3, that the proposed management and mitigation measures would be effective in reducing potential air quality impacts from Project-related activities.

The calculated annual average Scope 1 greenhouse gas emissions represent, as a maximum, approximately 0.04% of total greenhouse gas emissions for NSW and 0.01% of total greenhouse gas emissions for Australia.

Through detailed and conservative modelling, the air quality assessment (Northstar, 2021) has predicted that there would be a limited number of exceedances of the relevant air quality criteria 24-hour average PM_{10} at privately-owned residences or receptors. These would be the only exceedances of the air quality-related criteria for the Project.

It should be noted, however, that the air quality assessment was based on background data from 2017 collected by the Applicant. That data includes mining operations within the TGO Mine Site at a scale that would not be occurring during the life of the Project.

The existing real-time air quality monitoring network would be retained and expanded and would enable proactive management of the location and intensity of activities and/or increased controls to minimise emission of particulate matter when existing levels are approaching the relevant criteria. Northstar (2021) identify that with the implementation of the above mitigation measures, that exceedances were predicted to occur only on days where existing background levels were already at 95% of the relevant criteria.

Based upon conservative assumptions, the total estimated greenhouse gas (GHG) emissions over the Project life represent approximately 0.04% of total GHG emissions for NSW and 0.01% of total GHG emissions for Australia. The GHG emission estimates are conservative as they do not account for the offset of emissions through the increase in vegetative biomass through progressive rehabilitation, nor for improved carbon storage in soils as a result of improved agricultural practices. The Applicant is currently reviewing options to install solar power generation to offset power consumption within the TGO Mine Site. No decision has been made in relation to that proposal and subsequent approval under the EP&A Act would be required prior to installation. Notwithstanding this, potential exists to further mitigate greenhouse gas emissions from the Project.

Surface Water Resources

Potential impacts relating to surface water including erosion and sediment control, water availability and water quality, and flooding have been addressed through the design of the Project. The surface water assessment concludes that with water diversion around the Project Site, effects to downstream flows are predicted to be minimal. The potential for impacts for surface water quality would be managed over the life of the Project and monitored in accordance with an approved Water Management Plan. The design of the proposed realigned Newell Highway is such that the flood immunity would significantly increase from the existing 20% Annual Exceedance Probability (AEP) event to that of a 1% AEP event. Minor changes to overland flow paths and timing of flow peaks are expected and have been discussed with affected landholders. A range of mitigation measures have been agreed to manage anticipated impacts.

The outcomes of the Surface Water Assessment (Jacobs, 2021a and 2021b) have been used to refine the design of the Project to maximise the quantity of water that can practically be diverted around disturbance areas and away from the Project Site. Dirty or mine affected water would be retained and recycled on site and would not affect downstream water quality. Jacobs (2021a) states that there would be no significant impacts to surface water quality from the construction, operation and decommissioning of the Project that would not be managed through the appropriate application of surface water management and mitigation measures.

The Project would result in changes to the existing surface water and flooding environment. During the operational phase of the Project, the proposed realignment of the Newell Highway would achieve 1% AEP flood immunity, with some areas anticipated to reach a 0.1% AEP flood immunity. Compared to the maximum 20% AEP flood immunity of the current Newell Highway within the Flood Study Area, this represents a significant increase in flood immunity.

Jacobs (2021b) determined that the Project would result in minor changes to the distribution of overland flows as follows (**Figure ES5**).

- Peak flood levels upslope of the proposed Haul Road and Services Road and the realigned Newell Highway would be higher than currently. This is primarily as a result of construction of the proposed roads resulting in ponding of water where no water previously ponded.
- Peak overland flow levels immediately south of the Wyoming 1 Open Cut are expected to be lower than currently, primarily because the Newell Highway would not be overtopped during a 5% AEP rainfall event and peak flows would therefore be lower and later than is currently the case.

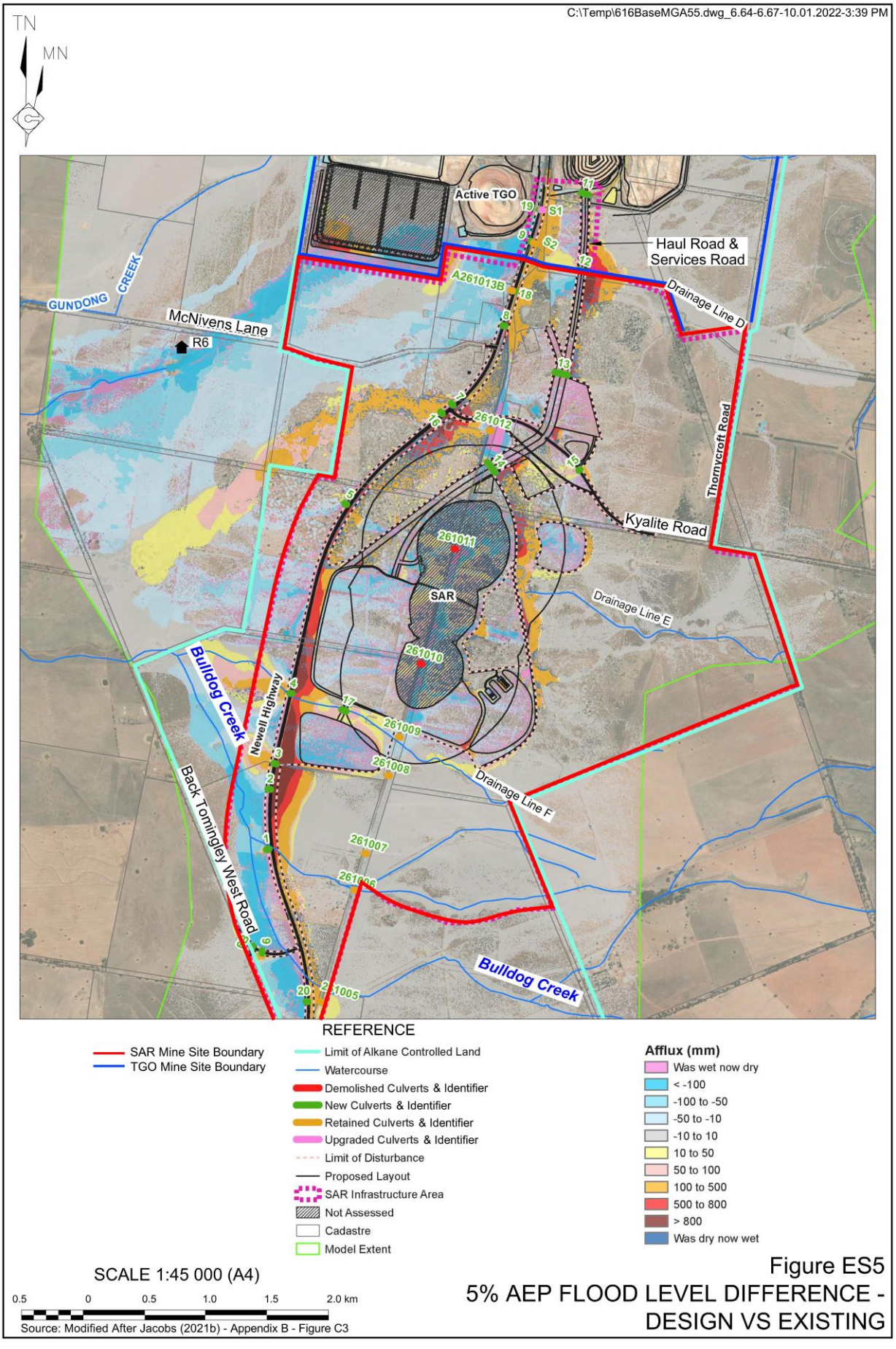


Figure ES5
5% AEP FLOOD LEVEL DIFFERENCE - DESIGN VS EXISTING

- Peak overland flow levels south and west of the approved Residue Storage Facility 2 are expected to be lower than before the facility was constructed. This is partly as a result of the construction of the approved Residue Storage Facility 2 directing water further south and partly as a result of the Highway no longer overtopping. The Applicant has discussed this matter with the owners of both properties potentially impacted and has agreed to construct diversion banks to re-establish existing flows.
- Peak overland flood levels downslope of the proposed intersection of the Newell Highway and Kyalite Road are expected to be higher than currently. This is primarily the result of additional water being diverted to the north around the SAR Open Cut and passed through culverts to the south of the intersection. The Applicant has discussed these additional flows with the single landholder potentially affected and has agreed to relocate gate access to paddocks to facilitate access during periods of overland flow.
- Peak overland flood levels to the southwest of the SAR Open Cut are expected to be higher than currently. This is primarily the result of additional water being diverted to the south around the SAR Open Cut. The anticipated additional flood height would be restricted to the Applicant's own land.
- Peak overland flood levels within the named Bulldog Creek downstream of the realigned Highway would be approximately 100mm lower than currently. This is primarily because the Newell Highway would not be overtopped during a 5% AEP rainfall event and peak flows would be lower than is currently the case.
- Overland flood levels at the point where Bulldog Creek crosses Back Tomingley West Road would be largely unchanged as a result of the Project because surface water flows merge at this point, resulting in a negligible change to water levels once each of the flood paths have merged.

Groundwater Resources

Based on the outcomes of the groundwater modelling and assessment, it is considered that potential impacts to the groundwater setting are generally understood and would be acceptably managed through the implementation of the Water Management Plan that includes a program for ongoing groundwater monitoring and management. To address uncertainty around long-term groundwater impacts and licencing requirements, a robust groundwater monitoring program would be implemented to allow for review and revision of groundwater model during 2024.

A Groundwater Assessment has been prepared by Jacobs (2021c) to assess the possible risks associated with the Project to groundwater resources including impacts to water supply bores, streamflow and natural ecosystems that are dependent on groundwater. A numerical groundwater model has been developed that simulates the regional groundwater system and known influences on the existing hydraulic behaviour of the system.

The principal changes to the groundwater setting would be caused by groundwater inflows to the existing and proposed workings and subsequent localised drawdown to the regional water table.

Based on modelling predictions, the key residual impacts to the groundwater system as a result of the Project include the following.

- The principal impacts of the Project would be restricted to the underlying fractured rock aquifer. The perched

alluvial aquifers, which support local groundwater use would not be impacted.

- During the Project life, groundwater inflow rates are predicted to be between 0.5ML/day to 2.5ML/day, with a peak of 3.04ML/day. Annual inflow rates are predicted to increase from approximately 230ML in 2021 to approximately 427ML in 2025, before further increasing to approximately 767ML in 2026.

- Post-mining inflows would progressively decrease over time as an equilibrium is reached in the final void lakes, with a final water level approximately 20m to 25m below that of the pre-mining groundwater levels. Water quality within the final voids would progressively decrease with time.

- The extent of the 2m drawdown contours within the underlying fractured rock aquifer would not encroach on any registered groundwater production bores, either at the end of mining operations or 200-years post mining **(Figure ES6**).

The Applicant has committed to obtaining adequate water licences to account for the anticipated inflow of 427ML in 2025. In the interim, the Applicant would collect additional groundwater monitoring data and would review and revise the groundwater model in 2024 to determine the likely peak groundwater inflows during the remaining life of the Project. Additional allocations would be obtained if required.

Based on the outcomes of the groundwater modelling and assessment, it is considered that potential impacts to the groundwater setting are well understood and would be acceptably managed.

Soils and Land Capability

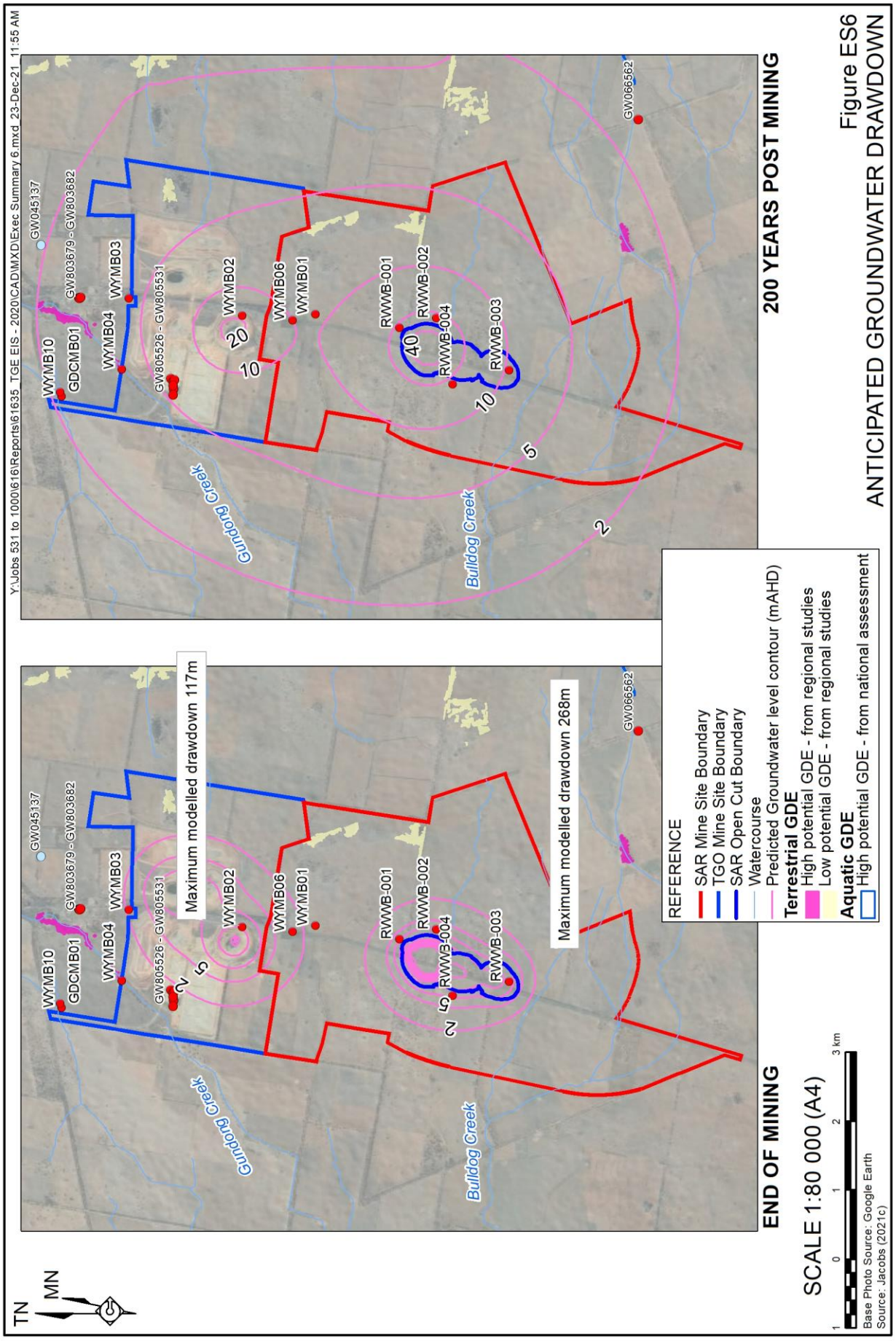
The proposed use of appropriate soil stripping, handling and stockpiling procedures would maximise the value of soils as a resource for rehabilitation purposes and minimise losses through erosion. There is no indication that soil conditions would constrain rehabilitation success.

A *Land and Soil Capability Assessment* (SSM, 2021a) was undertaken to guide the management of soils and to determine potential impacts to soils and land capability resulting from the Project. A total of six soil mapping units (SMUs) were identified within the SAR Mine Site with land and soil capability (LSC) Classes of 4 and 6. Two of the identified soil units were classified as Biophysical Strategic Agricultural Land . As a result, an application for a Gateway Certificate was prepared and a conditional Certificate was issued on 15 November 2021.

The Applicant would implement a range of soil stripping and soil stockpile management measures to maintain soil health and structure, ameliorate soil deficiencies and ensure that adequate topsoil and subsoil resources are available for progressive rehabilitation and closure activities.

Agricultural Resources, Land Uses and Enterprises

The *Agricultural Impact Statement* prepared for the Project TGO (2021a) determined that whilst the Project would remove agricultural land, proposed increases in agricultural productivity as a result of a range of improvements in land management, would ensure that the Project would only have minor to negligible impacts on land used for agriculture during Project life, and would in fact result in a net increase in the productivity of the land overall.


Y:\Jobs 531 to 1000\616\Reports\61635_TGE EIS - 2020\CAD\MXD\Exec Summary 6.mxd 23-Dec-21 11:55 AM
200 YEARS POST MINING
END OF MINING
Maximum modelled drawdown 117m
Maximum modelled drawdown 268m
Gundong Creek
Bulldog Creek
WYMB10
GDCMB01
WYMB04
WYMB03
WYMB02
WYMB06
WYMB01
RWWB-001
RWWB-002
RWWB-004
RWWB-003
GW045137
GW803679 - GW803682
GW805526 - GW805531
GW066562
REFERENCE
SAR Mine Site Boundary
TGO Mine Site Boundary
SAR Open Cut Boundary
Watercourse
Predicted Groundwater level contour (mAHD)
Terrestrial GDE
High potential GDE - from regional studies
Low potential GDE - from regional studies
Aquatic GDE
High potential GDE - from national assessment
TN
MN
SCALE 1:80 000 (A4)
Base Photo Source: Google Earth
Source: Jacobs (2021c)
Figure ES6
ANTICIPATED GROUNDWATER DRAWDOWN

Biodiversity

Of the four vegetation communities detected within the proposed limit of disturbance, two were identified as Threatened Ecological Communities (TEC). The Applicant substantially revised the Project design to avoid these TEC to the extent practicable. Notwithstanding this, a total of 11.48ha of TEC would be disturbed. The Applicant would retire the required 1 724 Ecosystem Credits through a combination of mechanisms under the BC Act.

No impacts to aquatic and/or groundwater dependent ecosystems are predicted to occur.

Comprehensive field surveys undertaken by AREA (2021) identified four vegetation communities within the proposed limit of disturbance, as follows.

- PCT 55 – Belah woodland.....43.78ha
- PCT 82 - Western Grey Box - Poplar Box - White Cypress Pine tall woodland 22.77ha
- PCT 201 – Fuzzy Box Woodland 10.80ha
- PCT 27 – Weeping Myall open woodland.....0.68ha

Two of these, namely PCT201 and PCT27 are identified as TEC under the NSW *Biodiversity Conservation Act 2016*, with PCT27 also identified under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*

Two threatened species, namely the Grey-crowned Babbler and the Superb Parrot were also observed.

AREA (2021) identified that the following Ecosystem Credits would be required for each of the vegetation communities identified. No Species Credits would be required.

- PCT 55 – Belah woodland.....552
- PCT 82 - Western Grey Box - Poplar Box - White Cypress Pine tall woodland 733
- PCT 201 – Fuzzy Box Woodland..... 426
- PCT 27 – Weeping Myall open woodland..... 13

In addition, PCT 201 - Fuzzy Box Woodland was assessed as a candidate for Serious and Irreversible Impacts. AREA (2021) undertook included detailed and targeted field and desktop assessments for this community and assessed the Applicant's ongoing Fuzzy Box management and replanting program. The Applicant contends that the Project would not result in Serious and Irreversible Impact on the Fuzzy Box Woodland TEC.

A range of management and mitigation measures have been proposed to avoid impacts to biodiversity, primarily through impact avoidance via Project design and the payment of offsets into the Biodiversity Offsetting Fund. In the long-term, the final rehabilitated landform of the SAR Mine Site would further strengthen the existing and approved biodiversity offsetting and management program of the TGO Mine Site.

Aboriginal Heritage

The Project would require the salvage of items or sites of Aboriginal cultural heritage significance from 12 identified sites that would or are likely to be disturbed due to Project operations. An additional six sites were identified that would be protected over the key development periods from inadvertent harm.

OzArk (2021a) prepared an *Aboriginal Cultural Heritage Assessment Report* for the Project in consultation with Registered Aboriginal Parties (RAPs). The survey identified 39 Aboriginal sites, comprising:

- two scarred trees;
- eight artefact scatters; and
- twenty-nine isolated finds.

Twelve sites would be disturbed by the Project, comprising:

- three scarred trees (two of which were identified by previous surveys);
- three artefact scatters; and
- six isolated finds.

Each would be salvaged in accordance with an *Aboriginal Heritage Management Plan* to be prepared in consultation with the RAPs and Heritage NSW.

A further six identified sites, whilst not directly impacted, would require protection from inadvertent disturbance via the installation of protective barriers.

Historic Heritage

No listed historic heritage sites are located in the vicinity of the Project Site; however, three sites were identified as having potential local heritage significance. The mitigation of the loss or harm to these objects would be managed based on the perceived risk of harm and in accordance with Local and State Government requirements, including programs of test excavations and archival recordings.

The Aboriginal and Historical Cultural Heritage Assessment undertaken by OzArk (2021a) identified four sites of potential historical heritage significance within the vicinity of the Project Site including the following.

- The "Rosewood" homestead and trotting stud.
- The ruins of "Old Thornycroft".
- The historic mining village of McPhail.
- The McPhail Mine.

It was concluded that the sites were of low significance on all criteria except for the potential for local heritage values. None of the sites would meet the thresholds for consideration of State heritage significance.

"Rosewood" homestead would be removed following photographic archival recording.

To further investigate the potential impact of the Project on McPhail village, the Applicant would undertake test-pitting within selected sections of the footprint of the realigned Newell Highway in the vicinity of the former the village.

Public Safety Hazards

The SEPP 33 Screening Study for Dangerous Goods identified that the storage and use of explosives within the SAR Mine Site required assessment in a Preliminary Hazard Analysis (PHA). That assessment determined that offsite risks associated with these materials are considered to be acceptable.

Similarly, a bush fire assessment undertaken by RWC assessed that it is likely that the Project would be able to operate with suitable Asset Protection Zones around key Mine Site components and comply with all requirements stipulated by the RFS.

Economic Considerations

The Economic Assessment has analysed the Project using both Cost Benefit Analysis and Local Effects Analysis methodologies.

In summary, the results of the Cost Benefit Analysis conclude that the Project is estimated to deliver the net economic benefits of $633.17 million[1]. Over the life of the Project, the Project would result in an average annual increase in regional production of $176.7 million, or 22.7% of the annual output of the Narromine Local Government Area.

[1] All figures have been discounted to 2021 dollars

Royalties to the State Government over the life of the Project are expected to be $43.8 million, with a further $47.14 million in other payments.

The Local Effects Analysis also considered the impacts at a local scale. In terms of employment, during operation the Project would provide an average of 179 additional full-time equivalent jobs, plus contractors. In addition, the Project would allow for the continuation of existing employment levels at the TGO Mine.

Social Considerations

A comprehensive program of community engagement and research has identified the anticipated and likely social benefits and risks of the Project. A range of feedback has been received indicating both support for and concern in regard to the Project. Overall, the local communities identified a range of substantial benefits that would arise from the Project, including economic benefits, local job creation and continued community support and finding. However, a range of perceived adverse impacts were also identified, including amenity (visual, noise and air quality) and ongoing challenges of being "heard" by the Mine and not being able to have a say on decisions negatively affecting daily life.

A range of community engagement and enhancement strategies are proposed to maximise the social benefit of the Project and minimise adverse social impacts.

The Social Impact Assessment has assessed both the positive and adverse social impacts of the Project. The predicted adverse impacts are primarily expected to be direct and localised relating to:

- way of life (how people work, rest and play); and
- surroundings including aesthetic values and/or amenity (social amenity).

The Applicant would seek to minimise these impacts through open, honest and proactive consultation with the local community and, where appropriate, adaptation of its operation or mitigation measures to address reasonable community concerns.

The Project would, however, result in very substantial positive impacts in the wider community in terms of continuation of employment, workforce and supplier expenditure, and community investment, with many of these benefits also expected to be experienced by the local community.

Environmental Management and Ongoing Consultation

Environmental Management

Responsible environmental management of the Project would be undertaken as an integral component of the overall management of the approved activities. All personnel would be inducted and trained in environmental management, consistent with their role and responsibilities.

The implementation and management of environmental management practices within the Project Site would be undertaken by suitably experienced employee of the Applicant whose principal function would be to coordinate the on-site environmental requirements, including compliance with commitments and procedures.

The Applicant intends to prepare all relevant environmental management documentation required by the NSW Government following the granting of development consent and a mining lease. This documentation would include the range of management and monitoring plans, a *Rehabilitation Management Plan* and ongoing annual documentation and be based on the existing and approved management plans for the TGO Mine Site. The Applicant would also continue to maintain a register to

comprehensively record all enquiries, complaints, the results of any investigations and responses.

Ongoing Community Consultation

The Applicant is committed to continuing to maintain and further develop Company-community relationships through regular and effective engagement and communication throughout the site establishment and construction stage and the operation of the Project. Components of the program would involve the following.

- Regular one-on-one consultation with surrounding landholders and stakeholders.
- Regular provision of environmental monitoring results via the Company website.
- Provision of site visits to view construction activities and operations.
- Continued operation of the CCC and publishing of meeting minutes on the Company website.
- Use of local community noticeboards.
- Regular information provision and community engagement including newsletters.

The Environment and Community Manager would continue to be responsible for maintaining and forging strong relationships with surrounding landholders and residences.

Project Evaluation and Justification

The evaluation of the Project was undertaken in light of the following.

- The Applicant's approach to project design and consideration of alternatives, including engagement with the community on the alternatives considered.
- The commitments made by the Applicant that relate to reducing the potential impacts of the Project, ongoing management in an environmentally and socially responsible manner and final rehabilitation of the Project Site.
- Design and planning of the Project in accordance with the principles of ecologically sustainable development.
- Consistency with State, regional and local planning matters and the objects of the EP&A Act, the principal legislation guiding development in NSW.
- The achievement of the objectives of the Project.

The design, scale and location of the Project has also been justified in terms of the outcomes of biophysical, social and economic assessment and consideration of the predicted residual impacts.

The Project has been subject to detailed review, refinement and assessment during design and planning, and the preparation of this EIS. It is concluded that the Project as proposed, would enable the Applicant to maximise the efficient mining for gold while mitigating the identified potential environmental and social impacts and maximising economic and social benefits. Importantly, it has been recognised that some people in the community may experience impacts that are greater than others or that the opportunities of the Project may not be evenly distributed.

The Applicant recognises the significant value of the existing relationships with the local community and the importance of establishing and maintaining a relationship of mutual trust with the community that would be achieved through accountability and transparency. This would be achieved through meaningful engagement throughout the Project life and monitoring of the environmental and social outcomes with results made available to the public.

Consequences of Not Proceeding with the Project

The consequences of not proceeding with the Project relate principally to the lost opportunity to mine the gold resources identified within the Project Site. The Applicant is confident that it has presented a Project that not only seeks the efficient development of the Project but has taken into consideration the likely experience of the mining activities for the local community and the predicted short-, medium- and long-term environmental outcomes. It is concluded that the Project, as presented, provides an acceptable balance of environmental, social and economic outcomes.

The demand for gold products correlates directly with need. The Economic Impact Assessment for the Project has identified that the Project would provide benefits to NSW of approximately $633.17 million. This benefit would be lost should the Project not proceed.

Mining provides additional economic opportunities as it is often connected to other industries (manufacturing, retail and service-based industry) and often provides the training and education that is eventually of benefit to other aspects of the community. These opportunities would be lost if the Project were not to proceed.

Should the Project not proceed, not only would the anticipated broader economic benefits associated with local employment and procurement of services and consumables not be achieved, but local enhancement projects and other community benefits would be cease once the TGO Mine reaches the end of the approved mine life on 31 December 2025.

Should the Project not proceed it is also likely that future exploration by the Applicant and others in the region would be reduced and subsequently the attractiveness of mineral development in the region.

It is anticipated that the Project would improve outcomes for local people seeking employment in the mining industry. The community anticipation of this benefit has been reflected in the outcomes of community engagement both by the Applicant and for the Social Impact Assessment, where both recognition of the existing benefits as well as enquiries for future opportunities were heard. Therefore, should the Project not proceed, these anticipated employment benefits would not eventuate resulting in both economic and potentially social and mental health impacts as a result of lost opportunity.

It is also accepted that should the Project not proceed; a range of residual environmental and social impacts would be avoided.

Public interest

In accordance with Section 4.15(1e) of the EP&A Act, evaluation of a development application by a consent authority must consider the public interest. Based on the assessments undertaken for the Project, it is considered that the EIS has been thorough in its consideration of matters relating to the public interest.

Consultation and engagement throughout the development of the EIS has identified a range of supportive feedback as well as legitimate concerns relating to the Project. As a result, the Applicant has proposed a range of measures to mitigate social impacts and enhance opportunities. Furthermore, the Project would be developed in accordance with the principles of ecologically sustainable development and the relevant planning considerations at both State and local government levels that need to be satisfied for the Project. The outcomes of environmental, economic and social assessments for the Project have confirmed that the Project would operate in accordance with the legislation, policies and guidelines developed to ensure responsible environmental practices for

development. It is therefore concluded that should it be approved, the Project would operate in accordance with the public interest.

Conclusion

This EIS has described the identified mineral resources in detail and explained the procedures necessary to develop the Project Site in a suitable manner. Each component of the assessment has been accompanied by a description of the environmental management commitments that have been proposed in order that:

- predicted residual environmental impacts remain acceptable;
- ongoing management, monitoring and reporting ensures that compliance is maintained;
- there are measures in place to ensure the community is aware of how environmental risks are being managed; and
- in the case of social commitments, benefits are distributed as equitably as possible.

Where uncertainty remains regarding the potential for residual risk of environmental impacts, the Applicant has committed to appropriate and tailored environmental monitoring to ensure that during the ongoing development and operation of the Project, the Applicant can predict, plan and proactively respond to predicted or realised impacts. Notwithstanding the above, the assessment of impacts for the Project has determined that environmental aspects have been mitigated to the maximum extent practicable and the Applicant contends that these would not result in unacceptable or unreasonable impacts.

Planning and design of the Project has been an iterative process that has involved refinements in response to the outcomes of assessment and the feedback from community engagement. The Applicant considers that the scale of the Project would be sufficient to provide a boost to the local economy but not cause substantial adverse environmental or social impacts. The Project, as presented, provides an acceptable balance of environmental, social and economic outcomes

The Applicant recognises the importance of establishing and maintaining a relationship of mutual trust with the community that would be achieved through accountability and transparency. This would be achieved through meaningful engagement throughout the Project life and monitoring of the environmental and social outcomes, with results made available to the public. In addition, the legacy of the Project has been considered with regards to the rehabilitation and final land use options and mechanisms to preserve the existing character of Tomingley village while providing sufficient economic stimulus to support existing businesses and a reasonable level of growth.

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