



TOMINGLEY
GOLD OPERATIONS PTY LTD
(A wholly owned subsidiary of Alkane Resources Ltd)

ABN: 53 149 040 371

Tomingley Gold Mine Modification Report

Project Approval No. 09_0155

Modification 4



Prepared by:



R.W. CORKERY & CO. PTY. LIMITED

February 2020

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Prepared for:

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February 2020



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EXECUTIVE SUMMARY

This *Modification Report* has been prepared by RW Corkery & Co. Pty. Limited on behalf of Tomingley Gold Operations Pty Ltd (the Proponent) to support the application to modify Project Approval (PA) 09_0155 for the Tomingley Gold Mine (the Proposed Modification). The Proposed Modification seeks consent for the following.

- Construction of Stages 7 to 9 of the Residue Storage Facility, comprising an additional 2.36Mt of capacity and an increase in height of 6m.
- Importation of waste rock and a bulk sample from proposed underground exploration to the south of the Mine Site and use of the Mine Site and associated infrastructure to support underground exploration operations south of the Mine Site.

No other changes to the approved Mine are proposed.

This application is made under Section 4.55(2) of the *Environmental Planning and Assessment Act 1979* and the Minister for Planning is the consent authority. The Proponent contends that the Proposed Modification complies with all preconditions for granting approval, including being substantially the same as the development approved under MOD 3 (when the consent was transitioned from a Part 3A approval to a State Significant Development).

The Proponent has undertaken consultation with Department of Planning, Industry and Environment, Narromine Shire Council, Environment Protection Authority and Transport for NSW. The Proponent has also consulted extensively with the community. No substantial issues of concern have been raised in relation to the Proposed Modification.

The Proponent contends that the environmental impacts of the Proposed Modification would be no greater than the impacts of the Mine as approved. Mitigation measures for the proposed activities would be consistent with those implemented for the approved Mine.

The Proposed Modification would secure the following for the remainder of the approved life of the Mine, namely until 31 December 2022.

- Direct employment for approximately 133 people, with wages and salaries of approximately \$10.3 million per year.
- Injection of approximately \$4 million to \$5 million per year into the local and regional economy, with an additional \$7 million to \$8 million per year into the State and Federal economies. This expenditure is likely to generate additional economic activity and flow on effects, providing further employment opportunities.
- Payment of approximately \$3.1 million per year in taxes, royalties, rates and other contributions.
- Ongoing support for training and education of employees and others in the vicinity of the Mine Site, including the Aboriginal community.
- Continued support for local sporting and other organisations.



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1. INTRODUCTION

1.1 SCOPE

This *Modification Report* has been prepared by RW Corkery & Co. Pty. Limited on behalf of Tomingley Gold Operations Pty Ltd (the Proponent) to support the application to modify Project Approval (PA) 09_0155 for the Tomingley Gold Mine (the Proposed Modification). The Tomingley Gold Mine (the Mine) is located immediately to the south of the village of Tomingley in central western NSW (see **Figure 1**). The Mine is operated by Tomingley Gold Operations Pty Ltd, a wholly owned subsidiary of Alkane Resources Ltd (Alkane).

PA 09_0155 has been modified three times previously as follows.

- MOD 1 (November 2013) - to adjust a range of commitments made during the original application which were no longer appropriate.
- MOD 2 (April 2015) – to permit enhancement of the approved and constructed amenity bund and a cut back of the approved Caloma 1 Open Cut.
- MOD 3 (July 2019) – to permit establishment of the Caloma 2 Open Cut, underground extraction from the Caloma 1 and 2 deposits and amendments to waste rock, surface water and soil management.

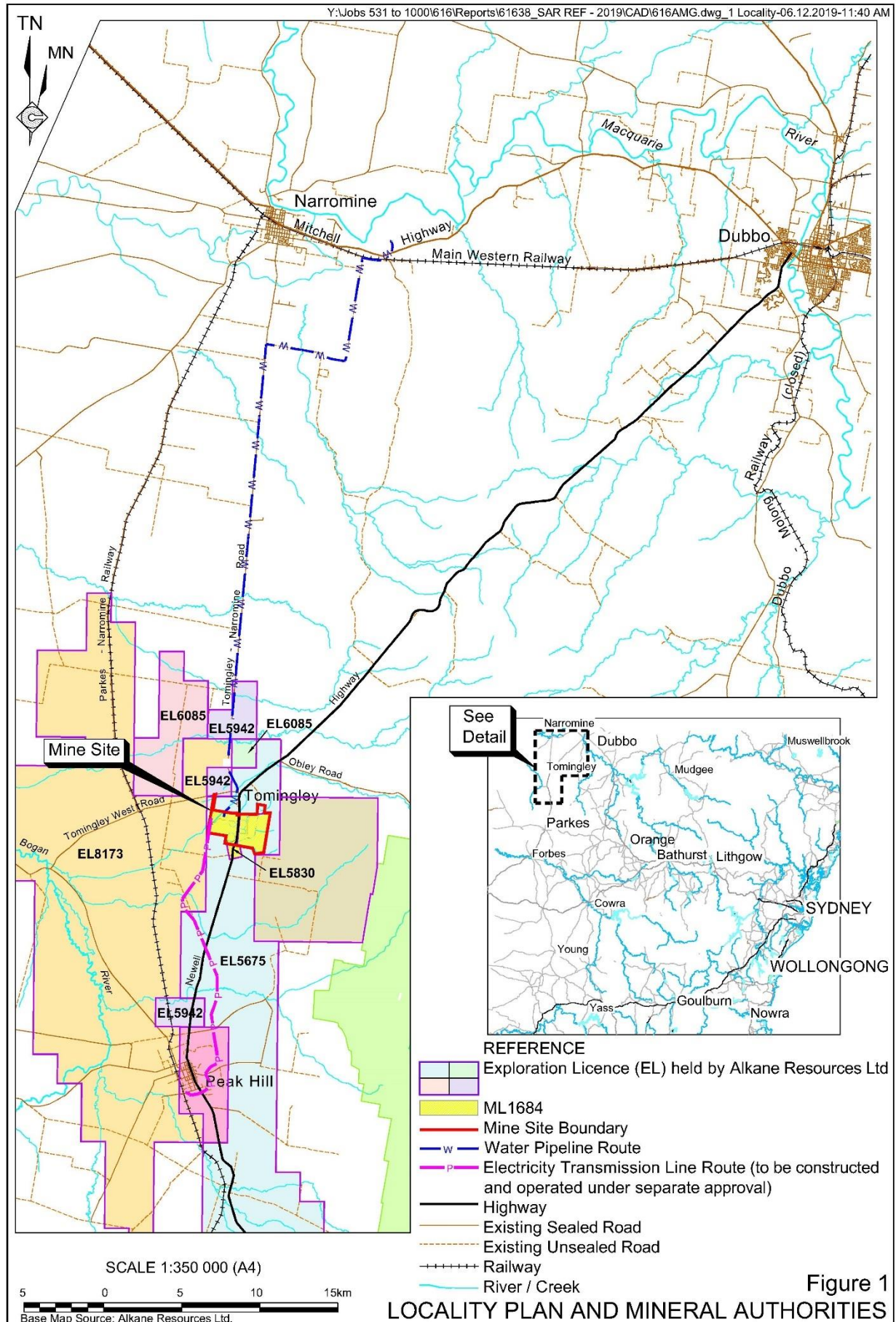
The Proposed Modification seeks consent for the construction of Stages 7 to 9 of the Residue Storage Facility. This would require the following.

- An increase the capacity of the Residue Storage Facility from approximately 6.57Mt to approximately 8.93Mt.
- An increase in the approved maximum elevation of the Residue Storage Facility of 6m from 280.5m AHD to 286.5m AHD.
- An increase in the approved footprint of the Residue Storage Facility of from approximately 50ha to approximately 55ha.

The Proposed Modification also seeks consent for the importation of waste rock and a bulk sample from the proposed underground exploration drive to the south of the Mine Site and use of the Mine Site and associated infrastructure to support underground exploration operations south of the Mine Site.

No other changes to the approved Mine are proposed.

The application to modify PA 09_0155 is made under Section 4.55(2) of the *Environmental Planning & Assessment Act 1979 (EP&A Act)*. This *Modification Report* has been prepared to support that application and is generally consistent with the draft document *Preparing a Modification Report* published by the NSW Department of Planning, Industry and Environment and dated June 2019 and addresses matters listed in correspondence from the Department of Planning, Industry and Environment received on 20 January 2020.

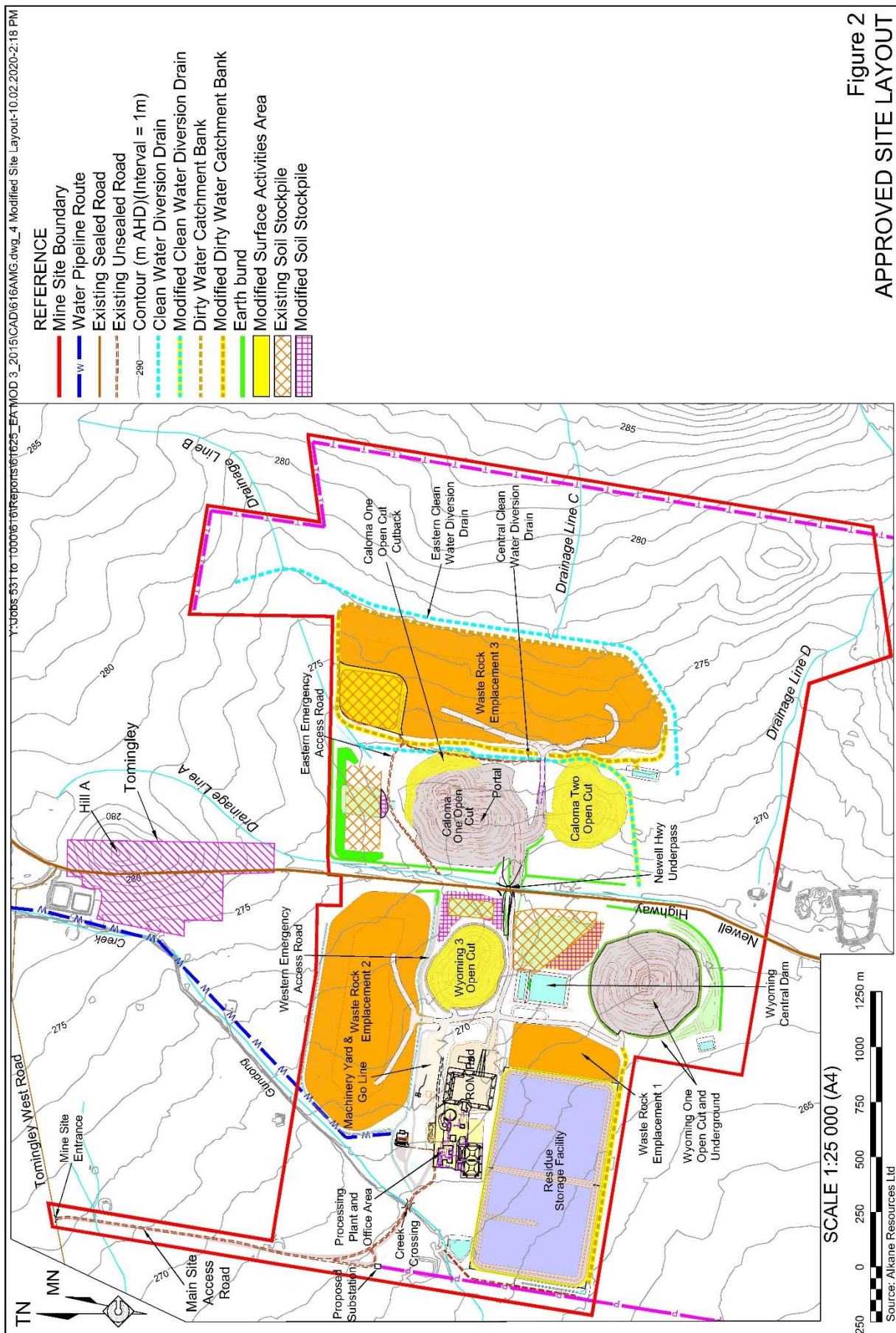


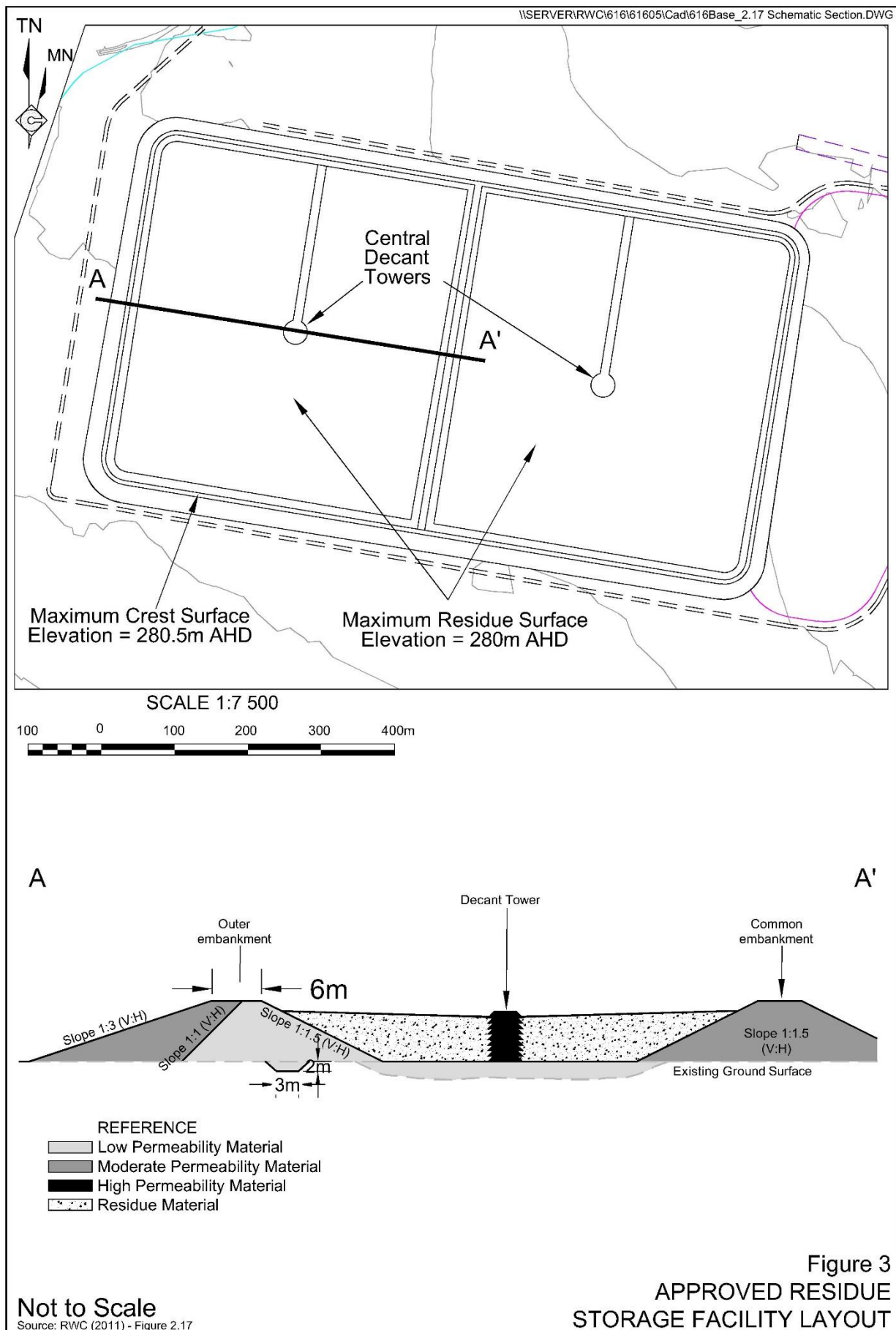
1.2 BACKGROUND

1.2.1 Approved Activities

Activities approved under PA 09_0155, as modified, include the following (**Figure 2**).

- Establishment of infrastructure required for the Project, including a water supply pipeline, an underpass beneath the Newell Highway, and revegetated amenity bunds.
- Extraction of waste rock and ore from four open cut areas, namely:
 - Caloma 1 and 2 Open Cuts; and
 - Wyoming 1 and 3 Open Cuts.
- Extraction of waste rock and ore from the Wyoming 1 and Caloma 1 and 2 underground mines.
- Construction of three out-of-pit waste rock emplacements, namely Waste Rock Emplacements 1, 2 and 3, and one in-pit emplacement, namely Wyoming 3 Open Cut.
- Construction and use of various haul roads, including an underpass under the Newell Highway, and a run-of-mine (ROM) pad.
- Construction and use of a processing plant and office area, incorporating a crushing and grinding circuit, a standard carbon-in-leach processing plant, site offices, workshops, ablutions facilities, stores, car parking, and associated infrastructure.
- Construction and use of the Residue Storage Facility to Stage 6, with a maximum elevation of 280.5m AHD an approximate storage capacity of 6.57Mt of residue. **Figure 3** presents the layout of the approved Residue Storage Facility.
- Construction and use of ancillary infrastructure, including:
 - surface water management structures;
 - a water pipeline from a licensed bore 7km east of Narromine;
 - electrical, telecommunication and other infrastructure; and
 - ancillary infrastructure.





1.2.2 Operation of the Mine

Construction of the Mine commenced in February 2013 with open cut mining commencing in November 2013. Open cut mining was completed in January 2019. During 2019, the Proponent processed previously stockpiled low-grade ore. The Proponent has placed the Processing Plant into care and maintenance from mid-December 2019 for a period of approximately 8 weeks.

Underground mining development from a portal in the Wyoming 1 Open Cut commenced in January 2019, with ore production from stopes commencing in December 2019. Processing of underground ore is expected to commence following restarting of the Processing Plant in February 2020.

Finally, the Proponent constructed and commenced filling Stage 6, the last approved stage, of the Residue Storage Facility, in July 2019.

Table 1 presents the publicly available production figures for the Mine for each financial year to June 2019. In summary, approximately 5.78Mt of ore was processed between the commencement of mining operations and 30 June 2019. The maximum annual rate of processing was 1.14Mt in 2015, less than the approved maximum rate of processing of 1.5Mtpa.

Table 1
Previous Production Statistics

Production	Units	Financial Year ending 30 June						Total
		2014	2015	2016	2017	2018	2019	
Waste mined	bcm	4,635,684	5,730,661	6,199,820	7,679,110	3,165,414	657,647	28,068,336
Ore mined	t	545,550	1,286,291	1,285,454	1,222,868	1,589,811	400,187	6,330,161
Ore milled	t	359,096	1,140,704	1,096,105	1,087,983	1,092,602	998,703	5,775,193

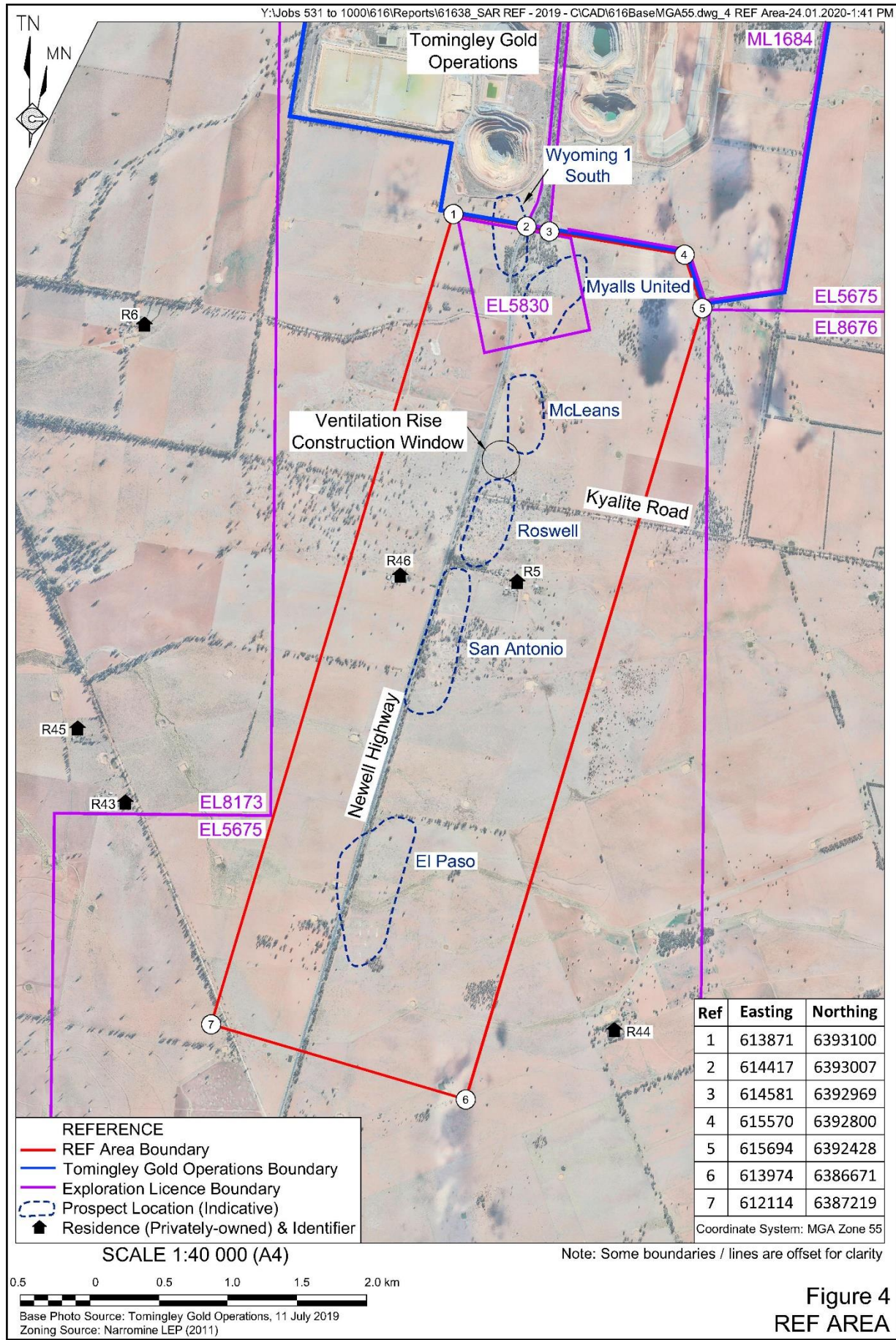
Source: Alkane Resources Ltd – June Quarterly Reports for each financial year

1.2.3 Associated Activities

The Proponent and Alkane continue to undertake a range of activities, primarily within Exploration Licences (EL) 5830 and 567, intended to extend the life of the Mine (**Figure 4**).

As indicated in RWC (2011), Alkane have been undertaking mineral exploration within and surrounding the Mine Site and have identified a series of prospects to the south of the Mine Site. Of particular interest are the San Antonio and Roswell (SAR) Prospects (**Figure 4**). Additional prospects include Wyoming South, Myalls United, McLean's and El Paso. These prospects are likely, with further drilling and testing, to contain ore that may be economically mined and processed using the facilities within the Mine Site.

The exploration and approval-related activities that are currently being undertaken and are proposed to be undertaken by Alkane and the Proponent include the following. The following is provided for information only and, except where described in Section 2.3, does not form a component of the Proposed Modification.



Surface mineral exploration¹

A 60,000m resource drilling program has been approved by the Resources Regulator under the *Mining Act 1992*. A portion of the assays have been received, with results indicating that the mineralisation comprises a series of sheet-like lenses striking approximately north-north east and dipping steeply to the east. Drilling is now largely complete on the Roswell Prospect and is continuing on the San Antonio Prospect. An initial inferred Mineral Resource estimate for the Roswell Prospect was released on 28 January 2020. That estimate identified an Inferred Mineral Resource of 7.02Mt at 1.97g/t gold for 445,000 ounces. A mineral resource estimate for the San Antonio Prospect expected to be released in March.

Underground mineral exploration

As a result of the steep dip of the mineralisation, drilling the deeper sections of the above prospects from surface is difficult and costly. As a result, Alkane has prepared a Review of Environmental Factors (REF) to support an application to the Resources Regulator under the *Mining Act 1992* to construct an exploration decline within the REF Area (**Figure 4**). The proposed activities would include the following.

- Development of an exploration drive within EL5830 and EL5675 from the existing Wyoming One underground workings.
- Establishment and use of ancillary infrastructure, including a ventilation rise. The ventilation rise would be the only surface disturbance associated with the proposed activities.
- Drilling of approximately 72 000m of exploration drill holes.
- Extraction of one or more bulk samples totalling no greater than 20 000t combined.

These activities are classified as activities permissible without development consent under Clause 6(a) of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*. Approval is, however, required under Part 5 of the *Environmental Planning and Assessment Act 1979* from the Resources Regulator. An application for that approval has been submitted to the Resources Regulator and is in progress.

The proposed exploration decline would be accessed from the approved Wyoming 1 underground workings and personnel and equipment would access the exploration decline via the Mine Site. Exploration activities for which approval is sought under the Proposed Modification include the following (see Section 2.3).

- Receipt of waste rock from the exploration decline.
- Receipt and batch processing of up to 20,000t of ore.
- Use of Mine Site infrastructure and equipment to support the proposed exploration operations.

¹ Information sourced from announcements made by Alkane to the Australian Stock Exchange, available from its website (<http://www.alkane.com.au/media-research/asx-announcements/>).

SAR Project Approvals

The Proponent anticipates that adequate Mineral Resources and Ore Reserves will be identified within the REF Area to permit mining of one or more of the prospects. A pre-Scoping Meeting with the Department of Planning, Industry and Environment was held on 30 January 2020 and the following information is based on information provided to the Department prior to that meeting.

The proposed mining operations would be undertaken in two stages as follows.

- Stage 1 - Underground Mining, comprising the following.
 - Extraction of ore by underground mining methods utilising the proposed exploration decline.
 - Transportation of extracted ore to the Mine Site via the decline for processing within the existing Processing Plant.
 - Construction and use of an additional Residue Storage Facility (to cater for both Stage 1 and Stage 2 ore). The location of this Residue Storage Facility has yet to be determined.
- Stage 2 – Open Cut Mining, comprising the following.
 - Extraction of ore and waste rock by open cut mining methods.
 - Transportation of extracted ore and waste rock to the Mine Site via a private haul road located to the east of the Newell Highway, to join with the existing haul road network in the vicinity of the Caloma 2 Open Cut.
 - Placement of waste rock within one or more of the existing open cuts. Once the initial sections of the SAR Open Cut are complete, waste rock would be placed within those sections. If required, an out-of-pit Waste Rock Emplacement may also be established.
 - Processing of the transported ore within the existing Processing Plant.
 - Placement of resulting residue within the Residue Storage Facility constructed during Stage 1.

Stage 2 mining operations would also require the following ancillary activities.

- Construction of a private haul road from the proposed open cut(s) to the Tomingley Gold Mine Site.
- Relocation of the Newell Highway and Kyalite Road.
- Relocation of a range of services, including fibre optic cables and power lines.
- Construction of a mine laydown and office area.
- Construction of surface water management structures.

1.3 NEED FOR THE MODIFICATION

1.3.1 Production Schedule to End of Life

Table 2 presents the processing schedule from 1 July 2019 to the current end of the approved life of the Mine on 31 December 2022, including actual tonnes processed between 1 July and 30 November 2019. In preparing the schedule from 1 December 2019 onwards, the Proponent has modelled a range of processing rates to reflect potential mining scenarios. **Table 2** presents the maximum reasonable and feasible mining and processing schedule as of 16 December 2019. In summary, based on the known mineralisation within the approved mining areas of Wyoming 1 and Caloma 1 and 2, approximately 2.48Mt of ore would be mined and approximately 2.96Mt of ore would be processed during the period 1 July 2019 to 31 December 2022. It is noted that the difference between these figures represents previously stockpiled low-grade material that has been and would be processed during this period.

Table 2
Maximum Mining and Processing Schedule to End of Approved Life

Production	Units	Financial Year ending 30 June			31 December 2022	Total
		2020	2021	2022		
Ore mined	t	451,868	812,250	812,250	406,125	2,482,493
Ore processed	t	978,741	812,250	812,250	406,125	2,955,289

Source: Tomingley Gold Operations Pty Ltd – revised mine schedule dated 16/12/2019

1.3.2 Mineral Resources and Ore Reserves

Throughout the life of the Mine, the Proponent has successfully added to the mineral resources and ore reserves associated with the Mine.² **Table 3** presents a summary of the published annual Mineral Resource and Ore Reserve statement for each Financial Year since 2013. The Proponent notes that:

- mining commenced in 2013 with an Ore Reserve of 3.6Mt;
- approximately 6.3Mt has been mined; and
- remaining Ore Reserves at 30 June 2019 were 1.4Mt.

² The JORC Code (2012) defines these terms as follows.

- A ‘Mineral Resource’ is a concentration or occurrence of solid material of economic interest in or on the Earth’s crust [with] reasonable prospects for eventual economic extraction.
- An “Ore Reserve” is the economically mineable part of a ... Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted.

Table 3
Summary of Mineral Resource and Ore Reserve Statements

Production	Units	Financial Year ending 30 June						
		2013	2014	2015	2016	2017	2018	2019
Mineral Resource								
Measured	t	5,649,549	5,461,000	4,720,000	2,849,000	3,697,000	1,554,000	1,317,000
Indicated	t	1,521,417	2,740,000	2,552,000	3,714,000	2,685,000	3,972,000	3,869,000
Inferred	t	5,414,659	5,267,000	3,979,000	3,060,000	2,845,000	1,257,000	1,253,000
Total	t	12,585,626	13,468,000	11,251,000	10,324,000	9,227,000	6,783,000	6,439,000
Ore Reserves								
Proved	t	3,300,000	3,971,000	3,775,000	2,571,000	2,077,000	1,513,000	722,000
Probable	t	300,000	635,000	588,000	1,742,000	602,000	694,000	688,000
Total	t	3,600,000 ¹	4,606,000	4,363,000	4,312,000	2,678,000	2,206,000	1,409,000
Source: Alkane Resources Ltd – Annual Report to Shareholders for each financial year								

In order to achieve this, the Proponent has converted approximately 4.1Mt of Mineral Resource to Ore Reserve during that period.

The Proponent anticipates that this rate of conversion of Mineral Resource to Ore Reserve will continue for the remainder of the life of the Mine. As a result, with 1.4Mt of Ore Reserve and 6.4Mt of Mineral Resource reported for 30 June 2019, the Proponent contends that there is adequate ore within the approved mining areas to support the maximum mining and processing schedule identified in **Table 2**.

1.3.3 Justification of the Proposed Modification

The Proponent anticipates that approximately 2.96Mt of ore will be processed between 1 July 2019 and the approved end of life of the Mine on 31 December 2022. The existing, approved Residue Storage Facility had, on 1 July 2019, a remaining approved capacity in Stage 6 of approximately 1.01Mt. As a result, an additional 1.95Mt of residue storage capacity will be required to enable to the continues operation of the Mine until the approved end of life. The Proposed Modification would provide storage capacity for an additional 2.36Mt of residue. The Proposed Modification would therefore permit continued operation of the Mine from the approved mining areas until the approved end of life at a mining rate that is less than the approved mining rate of 1.5Mtpa.

2. DESCRIPTION OF THE MODIFICATION

2.1 OVERVIEW OF THE PROPOSED MODIFICATION

The Proposed Modification seeks consent for the construction of Stages 7 to 9 of the Residue Storage Facility. This would require the following. **Figure 5** presents the proposed layout of the modified Residue Storage Facility.

- An increase the capacity of the Residue Storage Facility of 2.36Mt from approximately 6.57Mt to approximately 8.93Mt.
- An increase in the approved maximum elevation of the Residue Storage Facility of 6m from 280.5m AHD to 286.5m AHD.
- An increase in the approved footprint of the Residue Storage Facility of 5ha from approximately 50ha to approximately 55ha.

The Proposed Modification also seeks consent for the importation of waste rock and one or more bulk samples from proposed underground exploration drive to the south of the Mine Site and use of the Mine Site and associated infrastructure to support those underground exploration operations.

No other changes to the approved Mine are proposed.

Table 4 presents a comparison of the approved and modified Mine and Residue Storage Facility. **Appendix 1** presents a more detailed comparison of the Project as originally approved and the changes associated with each of the subsequent modifications.

2.2 MODIFIED RESIDUE STORAGE FACILITY

2.2.1 Introduction

A concept design for the modified Residue Storage Facility has been prepared by GHD, with the resulting report referred to hereafter as GHD (2019). A copy of that report is presented as **Appendix 2**. It is noted that, consistent with industry practice, that report presents a conceptual design for the Residue Storage Facility. The Proponent would complete the detailed Residue Storage Facility design following the granting of consent for the Proposed Modification. The detailed design would be consistent with the conceptual design presented in this document and would be compliant with all requirements of the Australian National Committee on Large Dams, the NSW Dam Safety Committee and currently accepted practice for Australian dam engineering.

This section presents a description of the current, approved Residue Storage Facility, as well as the modified Facility.

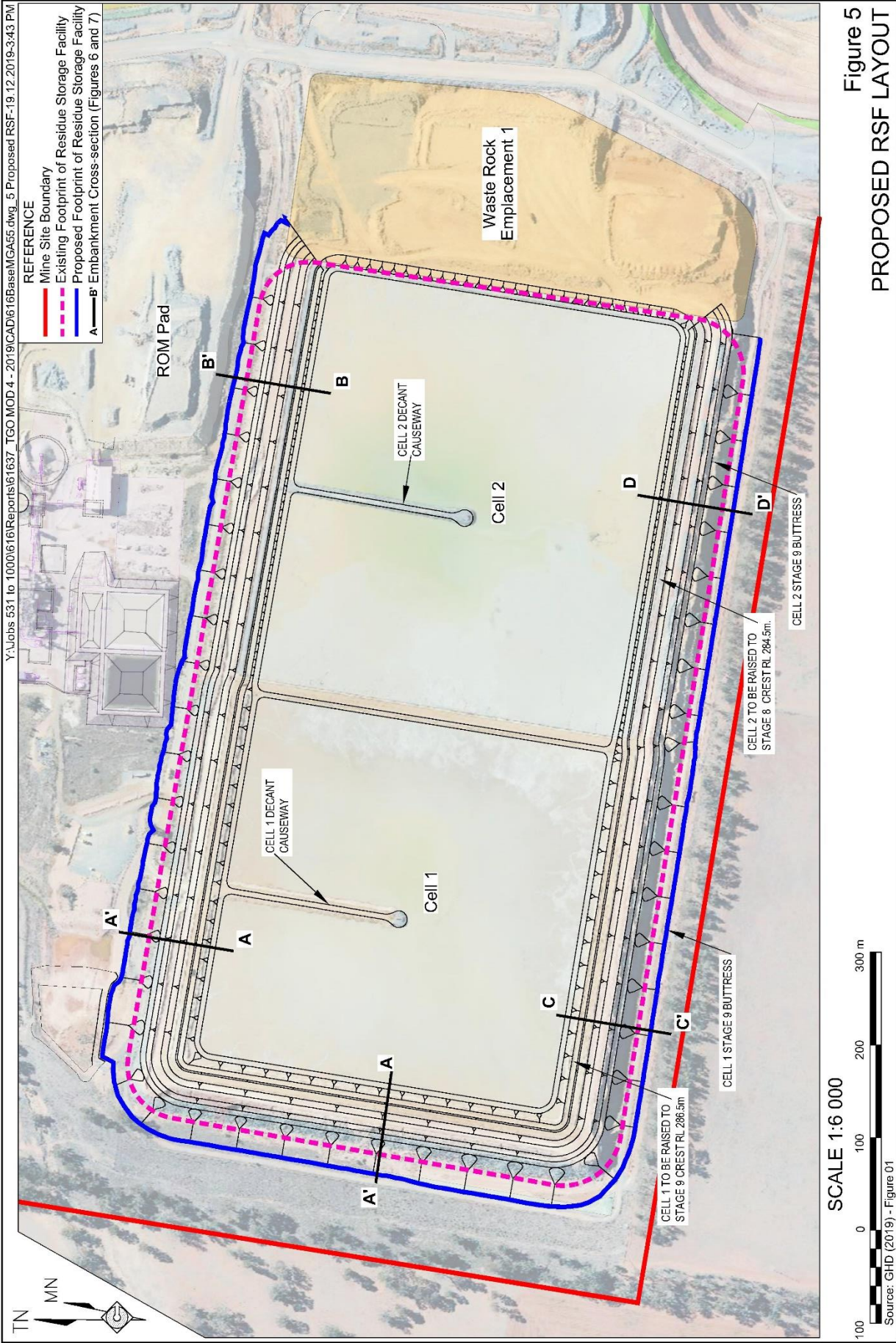


Table 4
Comparison of the Approved and Modified Mine and Residue Storage Facility

Element	Currently Approved	Proposed
Overall Operation		
Mine Site area	Approximately 776ha	
Mining operations	4 x open cuts (Wyoming 1, Wyoming 3, Caloma 1 and Caloma 2) 3 x underground ((Wyoming 1, Caloma 1 and Caloma 2)	
Waste rock management	3 x out of pit Waste Rock Emplacements (WRE1, WRE1 and WRE3) 1 x in-pit Waste Rock Emplacement (Wyoming 3) Underground stope backfilling	
		Importation of up to 335,000t of waste rock from the proposed exploration drive
Processing operations	ROM Pad Crushing and grinding circuits Gravity separation and cyanide leaching circuits	
		Batch processing of up to 20,000t of bulk sample from the proposed exploration drive
Processing rate	Annual - Up to 1.5Mtpa Life of Mine – no limit specified	
Residue Management		
- Maximum Capacity - Maximum Design Stage - Maximum elevation - Maximum footprint - Compliant with all ANCOLD and NSW DSC requirements	6.57Mt Stage 6, Cell 2 280.5m AHD Approximately 50ha Yes	8.93Mt Stage 9, Cell 1 286.5m AHD Approximately 55ha Yes
Transportation	Up to 8 heavy vehicle movements per day	
Hours of operation	- Vegetation clearing and topsoil stripping 6am to 6pm, 7 days - Construction 24-hours, 7 days - Mining, maintenance, processing 24-hours, 7 days - Rehabilitation 7am to 10pm, 7 days	
Project Life	Until 31 December 2022	
Employment (employees and contractors)	Up to approximately 130 full time equivalent ¹	
Economic Contributions		
Wages and salaries	Up to approximately \$13 million per annum	
Goods and services	Up to approximately \$34 million per annum	
State Taxes and Royalties	Up to approximately \$2 million per annum	
Planning agreement	\$118,750 per annum	

2.2.2 Existing Residue Storage Facility

The existing Residue Storage Facility is described in Section 2.7.2.1 of RWC (2011). In summary, key features of the approved RSF include the following (**Figure 3**).

- Crest elevation280.5m AHD
- Crest width 6m
- Slope of outer face 1:3 (V:H)
- Slope of inner face 1:1.5(V:H)
- Key trench up to 2m deep, base 3m wide, side slopes = 2:1 (V:H)
- Maximum elevation of residue 280.0m AHD
- Design storage capacity approximately 4.8Mm³

The foundation of the Residue Storage Facility was investigated by DE Cooper & Associates Pty Ltd. A total of 25 test pits were excavated and determined that the foundation comprises stiff clay with some traces of sand. The hydraulic conductivity of the foundation was determined to be low to very low, with permeability testing returning results between 2.3×10^{-8} m/s and 1×10^{-9} m/s. DEC (2009) recommended ripping, moisture conditioning and compacting the foundation. The NSW Dam Safety Committee accepted that Residue Storage Facility design presented by DEC (2009) met the requirements of the committee, as they were at that time.

The approved Residue Storage Facility includes six lifts or Stages, with each constructed using upstream lifts, namely construction of the subsequent lift on previously deposited residue. A number of buttresses have been constructed at Stages 4 and 6.

The approved design of the Facility included a storage volume of 4.8Mm³. DEC (2019) assumed an average settled residue density of 1.45t/m³, resulting in a storage capacity of 6.96Mt for the approved facility. GHD (2019) estimate the actual storage capacity of the Facility, taking into account slight variations in the as constructed design and a slightly lower settled residue density of 1.4t/m³ (see Section 2.2.3), is 6.57Mt.

Construction of the final stage of the facility, namely Stage 6, commenced in early 2019 and began accepting residue in early July 2019.

The Facility operates as a subaerial residue deposition facility, with residue deposited from spigots around the perimeter of the Facility. Residue is deposited onto a “beach”, with supernatant water permitted to flow to one of two central decant towers from where it is pumped to either the Process Water Pond or the Wyoming Central Dam (**Figure 2**).

The Proponent manages dust emissions from the Facility through the management of the residue discharge cycles to maintain a damp surface. Where required, chemical polymer dust suppressants are applied to the surface of the tailings to prevent dust lift off.

The Proponent ensures that the concentration of weak acid dissociable (WAD) cyanide in residue discharged to the Residue Storage Facility is less than 20mg/L 90% of the time, with a maximum concentration of 30mg/L at all times.

The Proponent monitors groundwater in the vicinity of the Residue Storage Facility within 11 shallow monitoring bores. Groundwater monitoring results are described in more detail in Section 6.4.1, however, GHD (2019) state the following.

- There is no evidence of leachate from the Facility in shallow groundwater surrounding the Facility.
- A rising trend in groundwater levels in the vicinity of the Facility is likely attributable to factors other than leakage from the Facility.

As a result, the existing Residue Storage Facility has not resulted in adverse environmental impacts and there have been no reportable environmental incidents associated with the operation of the Facility.

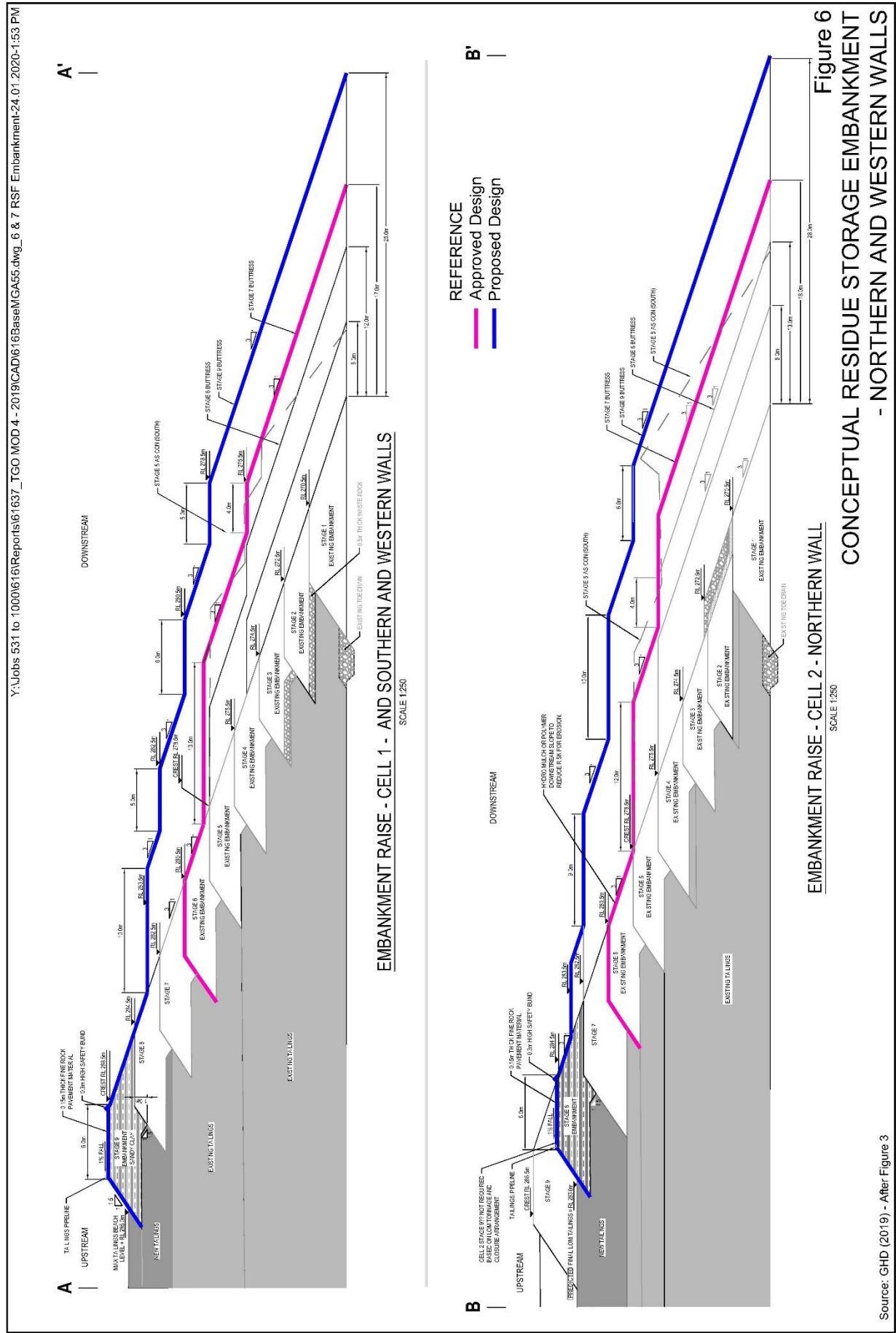
2.2.3 Design of the Modified Residue Storage Facility

GHD (2019) presents the conceptual design for the modified Residue Storage Facility. In summary, the proposed Residue Storage Facility would have the following design criteria (**Figures 5 to 7**).

- Maximum crest elevation 286.5m AHD
- Maximum elevation of residue 286.0m AHD
- Crest width, including safety bund 6m
- Slope of outer face 1:3 (V:H) (northern and western walls)
..... 1:2.5 (V:H) (southern walls)
- Slope of inner face 1:1.5(V:H)
- Cumulative maximum capacity 8.93Mt
- Dambreak Consequence Category (ANCOLD) Significant
- Environmental Spill Consequence Category (ANCOLD) Significant
- Decant systemmaintain current central decant towers
- Decant pond capacity 1:10,000-year AEP flood event
- Spillway.....not required, designed for no spill

In determining the cumulative storage capacity, GHD undertook aerial surveys of the Facility in on 31 December 2015 and determined that the facility contained 1.539Mm³ of residue and that 2.127Mt of residue had been placed into the Facility. As a result GHD (2019) assumed a settled residue density of 1.4t/m³.

The proposed Residue Storage Facility would be constructed in three stages, namely Stages 7 to 9, with Stages 7 and 8 comprising two cells, with a single cell only proposed for Stage 9.



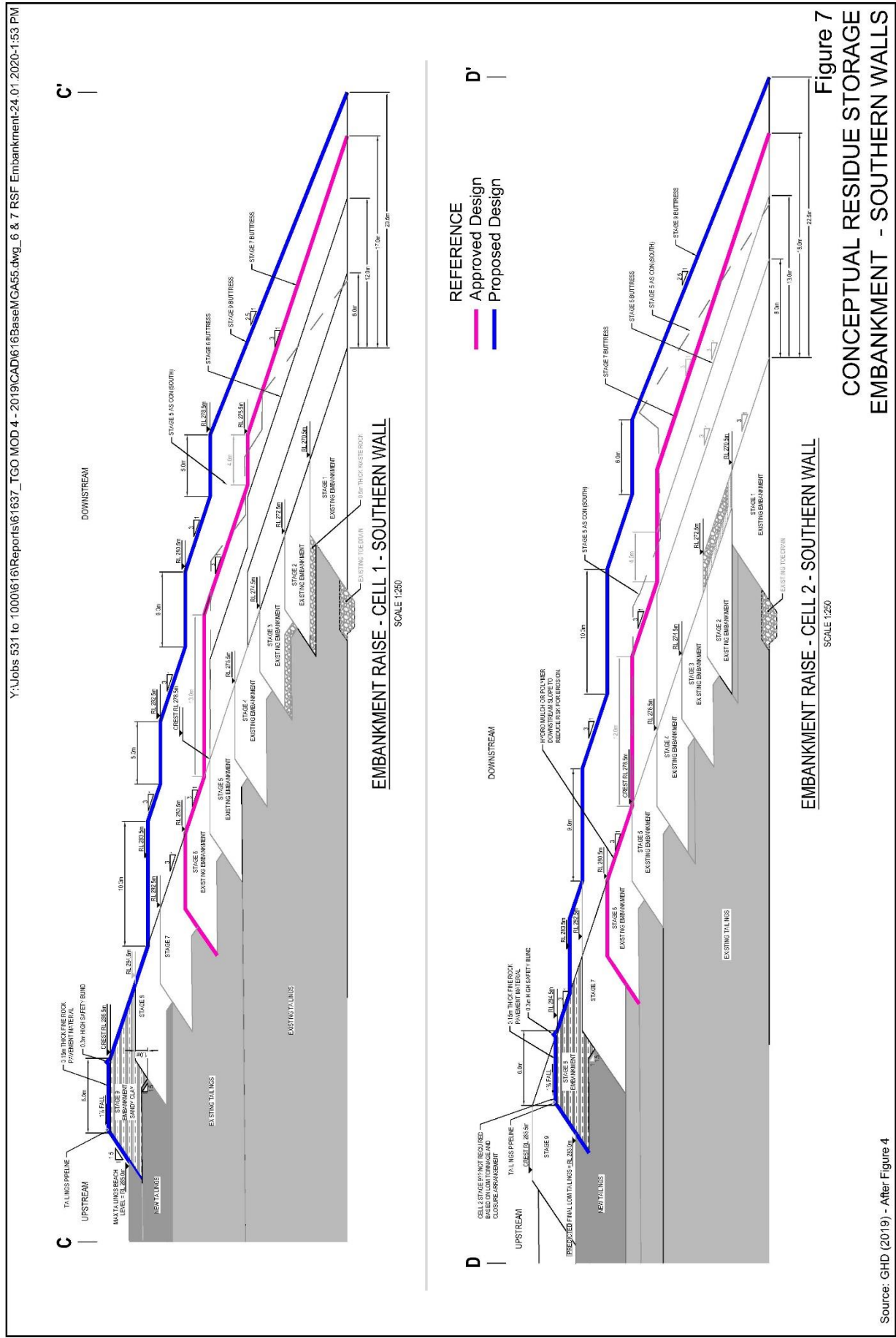


Table 5 presents the anticipated storage capacity for each Stage.

Table 5
Estimated Residue Storage Facility Capacity

Construction Activity	Incremental Storage (Mt)	Additional Cumulative Storage (Mt)	LOM Cumulative Storage (Mt)
Cell 2 Stage 6 (as approved)	-	-	6.57
Stage 7 Cell 1	0.47	0.47	7.04
Stage 7 Cell 2	0.51	0.98	7.55
Stage 8 Cell 1	0.45	1.43	8.00
Stage 8 Cell 2	0.50	1.93	8.50
Stage 9 Cell 1	0.43	2.36	8.93
Source: GHD (2019) – After Table 7-1			

The modified Residue Storage Facility would be constructed using waste rock material sourced from existing Waste Rock Emplacements or from ongoing mining operations. Each Stage, with the exception of the eastern embankment, would be constructed using upstream lifts whereby the embankment for the subsequent Stage would be constructed on the surface of the residue emplaced during the previous Stage. The eastern embankment would utilise the existing WRE1.

The perimeter service road and seepage collection drain would be relocated to accommodate the larger footprint of the Residue Storage Facility, with the southern face of the Facility to be constructed with a slope of 1:2.5 (V:H) to permit a minimum of approximately 10m between the toe of the Facility and the Mine Site boundary. The GHD (2019) contends that this is an adequate distance to construct the required infrastructure.

2.2.4 Stability Analysis

GHD (2019) undertook an analysis of the stability of the Stage 7 and Stage 8 and 9 Raises. The detailed results of those assessments are presented in Sections 3 and 4 of GHD (2019) and may be summarised as follows.

- Stage 7 – requires an 18m buttress from the toe of the Stage 1 embankment, noting that a 13m buttress already exists for the approved Stage 6 (see **Figures 6 and 7**).
- Stage 8 and 9
 - Northern and western walls - require a 26m and 28m buttress for cells 1 and 2 respectively, noting that 12m and 13m buttresses already exist for the approved Stage 6 (see **Figures 6 and 7**).
 - Southern wall – requires a 20.5m and 22.5m buttress for Cells 1 and 2 respectively, noting that 12m and 13m buttresses already exist for the approved Stage 6 (see **Figures 6 and 7**). In order to achieve the proposed 1:2.5 (V:H) outer face, the Proponent would utilise higher strength material for the construction of the buttress, including unweathered waste rock or compacted clay fill.

GHD (2019) note that the detailed design for the Residue Storage Facility would further clarify the buttress requirements but that a minimum 10m buffer between the toe of the buttress and the Mine Site boundary would be maintained.

2.2.5 Water Balance Analysis

GHD (2019) undertook an analysis of the water balance for the Residue Storage Facility under mean, as well as 5th and 95th percentile rainfall conditions. The detailed results of that analysis are presented in Section 5 of GHD (2019). In summary, GHD (2019) determined that even under 95th percentile wet rainfall years, the volume of water within the process water system would remain very substantially under the maximum capacity of approximately 575ML.

2.2.6 Seepage Analysis

GHD (2019) also undertook an analysis of expected seepage from the modified Residue Storage Facility. The detailed results of those assessments are presented in Sections 3 and 4 of GHD (2019) and may be summarised as follows.

- Three aquifers exist in the vicinity of the Residue Storage Facility as follows.
 - Shallow alluvium, typically associated with creeks and water courses.
 - Deep alluvium, typically up to 100m deep overlying the basement bedrock.
 - Fractured rock aquifer, typically below 80m deep and characterised by low yields and poor-quality groundwater.

As indicated in Section 2.2.2, groundwater monitoring results indicated that there is no evidence of supernatant water from the Residue Storage Facility in shallow groundwater surrounding the Facility.

GHD (2019) undertook a one-dimensional calculation of vertical advective flow from the decant pond to the underlying foundation of the facility for the current Stage 6 and proposed Stage 9. Three scenarios were modelled as follows.

1. Seepage from decant pond to the base the residue.
2. Seepage from decant pond to shallow groundwater assuming a foundation permeability of 1×10^{-8} m/s.
3. Seepage from decant pond to shallow groundwater assuming a foundation permeability of 1×10^{-9} m/s.

Table 6 presents the results of that analysis. In summary, the modelling indicates that the Proposed Modification would result in a marginal reduction in the seepage rate from the decant pond for Scenarios 1 and 2 and a marginal increase in the rate for Scenario 3.

Table 6
Results of Seepage Analysis

Scenario	Stage 6		Stage 9	
	Calculated seepage volume (kL/d)	Seepage time (years)	Calculated seepage volume (kL/d)	Seepage time (years)
Scenario 1	23.1	33.4	22.8	52
Scenario 2	22.7	57.1	22.6	70
Scenario 3	4.9	265.7	6.9	230

Source: GHD (2019) – After Table 6.1

2.3 SUPPORT ACTIVITIES FOR ADJACENT UNDERGROUND EXPLORATION

As identified in Section 1.2.3, Alkane has submitted an application under the *Mining Act 1992* for the development of an exploration decline to permit exploration of the SAR Prospects from underground, as well as extraction of one or more bulk sample(s) up to a combined 20,000t. The proposed exploration decline would be developed from the approved Wyoming 1 underground workings and all waste rock and the bulk sample would be transported via the proposed decline to the Mine Site, with no surface transportation.

While the majority of exploration-related activities would be undertaken within the EL5830 and EL5675, the following activities would be undertaken within the Mine Site.

- Receipt of up to up to 335,000t or 161,250 loose cubic metres*³ of waste rock. This material would be managed in accordance with the approved waste rock management procedures and would be placed within;
 - completed stopes within the Wyoming 1 underground mine; or
 - transported to surface and stored within the Wyoming 1 Open Cut pending transportation back underground for backfilling completed stopes; or
 - placed permanently into WRE1 or the Wyoming 3 Open Cut.
- Receipt of up to 20,000t of ore for testing and batch processing within the processing plant, with the resulting residue placed within the Residue Storage Facility.

³ Anticipated tonnes based on the following assumptions.

- Decline length = up to 4000m
- Decline width = 5m
- Decline height = 6m
- Ventilation rise length = 250m
- Ventilation rise diameter = 4.5m
- Density of insitu waste rock = 2.7t/m³
- Anticipated tonnes of waste rock

$$= ((4,000 \times 5 \times 6) + (\pi \times 2.25^2 \times 250)) \times 2.7$$

$$= (120,000 + 3,976) \times 2.7$$

$$= 334,735\text{t}$$
- Anticipated volume of waste rock

$$= ((4,000 \times 5 \times 6) + (\pi \times 2.25^2 \times 250)) \times 1.3 \text{ swell factor}$$

$$= (120,000 + 3,976) \times 1.3$$

$$= 161,168 \text{ loose cubic metres}$$

- Use of Mine Site infrastructure and equipment to support the proposed exploration operations, including:
 - ventilation, power, water and other services;
 - mobile plant and other equipment; and
 - surface facilities, including offices, workshops, store rooms and amenities.

The Proponent contends that importation of waste rock from the proposed exploration decline would not result in significant impacts for the following reasons.

- The proposed importation of 355,000t of waste rock would represent 1.5% of the 28Mt of waste rock mined to 30 June 2019.
- The imported waste rock would be indistinguishable from waste rock extracted within the Mine Site. Namely waste rock sourced from the exploration decline would be development waste from the same geological units at those that occur with the Mine Site. The imported waste rock would be non-acid forming.
- The imported waste rock would be managed in accordance with the Proponent's existing waste rock management procedures.
- The proposed importation would result in no additional surface activities with the potential to adversely impact on the environment.

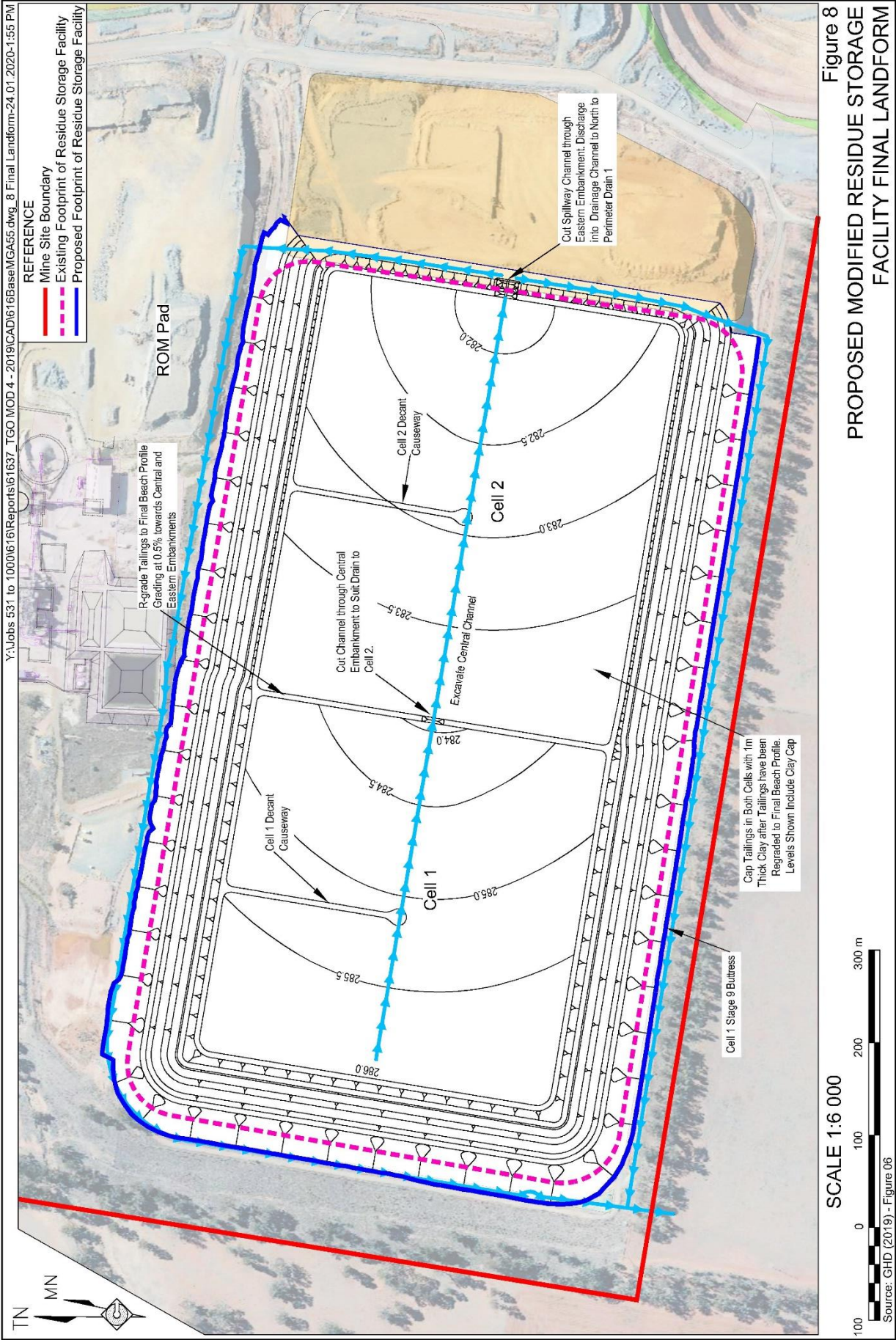
In addition, the Proponent contends that importation and batch processing of 20,000t of ore as one or more bulk sample(s) not result in significant impacts for the following reasons.

- The bulk sample(s) would represent 0.2% of the approximately 8.6Mt of ore to be processed throughout the life of the Mine.
- The resulting residue would be managed with and would be indistinguishable from the residue produced by the approved Mine.

2.4 SITE DECOMMISSIONING AND REHABILITATION

Decommissioning of the Residue Storage Facility would be broadly consistent with Section 2.14 of RWC (2011). **Figure 8** presents the indicative final landform for the modified Residue Storage Facility. In summary, the following procedures would be implemented during decommissioning and rehabilitation of the Facility. A detailed closure plan would be presented in the MOP to be prepared following receipt of consent for the Proposed Modification.

- On completion of placement of residue, the decant ponds would be emptied and the tailings surface permitted to dry out. Chemical dust suppressants would be utilised to prevent dust lift-off as required.
- The residue surface would be regraded to permit surface water to flow from west to east.
- Channels would be cut through the central and eastern embankments to permit surface water to flow from Cell 1 to Cell 2 and then to perimeter drains.



- Perimeter drains would be established to direct water from the surface of the Residue Storage Facility to natural ground level, then to a suitable storage facility prior to the completion of revegetation operations.
- The upper surface of the facility would be capped indicatively with 1m of clay and revegetated to grassy woodland as indicated in the currently approved MOP.
- Consistent with the approved Mine, once the revegetation operation are complete and testing indicates that discharged water would not pollute surrounding waters, surface water would be permitted to be discharged from the Mine Site.

3. STRATEGIC CONTEXT

3.1 STRATEGIC PLANS

3.1.1 Central West and Orana Regional Plan 2036

The *Central West and Orana Regional Plan 2036* (the Plan) published by the NSW Department of Planning and Environment in June 2017 sets out the NSW Government's blueprint for the future of the Central West and Orana Regions to 2036. The Plan covers an area including Nyngan and Condobolin in the west, Cowra in the South, Oberon and Lithgow in the east and Coonamble and Coonabarabran in the north. The Plan identifies four goals, each with multiple sub-goals of directions, as follows. The following also identifies how the Proposed Modification is consistent with each of those goals.

Goal 1 - The most diverse regional economy in NSW

The Plan identifies that agriculture, manufacturing and mining are the Regions' traditional industries. However, health, education and tourism sectors present new opportunities for economic growth. The Proposed Modification would be consistent with the following Directions.

- Direction 1: Protect the region's diverse and productive agricultural land.
The Proposed Modification would not disturb additional agricultural land or adversely impact on such land.
- Direction 6: Expand education and training opportunities
The Proposed Modification would permit the Proponent to continue to employ employee apprentices and trainees and contribute to training programs for the local community, including the Aboriginal community through its partnership with the Peak Hill local Aboriginal community.
- Direction 7: Enhance the economic self-determination of Aboriginal communities.
The Proponent has a long history of working with the Peak Hill Aboriginal community to promote training and business opportunities
- Direction 8: Sustainably manage mineral resources.
The Proposed Modification would ensure that capacity constraints within the Residue Storage Facility do not limit the Proponent's ability to continue to operate the Mine until the currently approved end of life on 31 December 2022.

Goal 2 - A stronger, healthier environment and diverse heritage

The Plan identifies that the Regions have some of Australia's most unique ecological systems and that achieving environmentally sustainable development will balance rural and urban compatibility issues. The Proposed Modification would be consistent with the following Directions.

- Direction 13: Protect and manage environmental assets
The Proposed Modification would not result in disturbance of additional undisturbed land. Similarly, the Proposed Modification would not result in additional groundwater, surface water, air quality or other impacts.

- Direction 16: Respect and protect Aboriginal heritage assets
The Proposed Modification would not result in disturbance of additional undisturbed land or Aboriginal objects.

Goal 3 - Quality freight, transport and infrastructure networks

The Plan identifies that the Central West and Orana are a major exporter of agricultural, mining and other value-added products and relies on efficient freight and transport infrastructure. The Proposed Modification would not result in changes to the road network or off-site transportation.

Goal 4 - Dynamic, vibrant and healthy communities

The Plan identifies that Central West and Orana is home to some of the most diverse communities in NSW. Population growth will not be evenly distributed, with larger towns such as Orange, Bathurst, Mudgee and Dubbo expected to grow, while the population of other smaller towns and villages is likely to remain relatively stable or in some cases decline. These smaller communities can grow and prosper by leveraging economic opportunities and jobs from an increasing number of value-adding investments.

The Proposed Modification would be consistent with the following Directions.

- Direction 23: Build the resilience of towns and villages.
The Proposed Modification would ensure continued operation of the Mine at least until the approved end of life on 31 December 2022. This would help support the small villages and towns surrounding the Mine Site, including Tomingley, Peak Hill and Narromine, and provide additional economic activity in those communities.
- Direction 24: Collaborate and partner with Aboriginal communities.
The Proponent has a long history of collaborating with the Peak Hill Aboriginal community. The Proposed Modification would provide the resources for that ongoing collaboration to continue.

3.1.2 Narromine Shire Community Strategic Plan 2027

The *Narromine Shire Community Strategic Plan 2027* provides the community vision and aspirations for the future of the Narromine Shire and a long-term framework to guide and influence delivery of that vision. The Plan lists a number of relevant guiding principles. The following also identifies how the Proposed Modification is consistent with each of those principles.

Principle 1 - Vibrant communities

The Proposed Modification would ensure that the Proponent can continue to offer a range of training and education opportunities for its employees and others consistent with Action 1.3 of the Plan.

Principle 2 - Growing our economy

The Proposed Modification would ensure continued operation of the Mine at least until the approved end of life on 31 December 2022. This would be consistent with each of Actions identified under this Principle.

Principle 3 - Protecting and enhancing our environment

The Proposed Modification would not result in disturbance of additional undisturbed land. Similarly, the Proposed Modification would not result in additional groundwater, surface water, air quality or other impacts. As a result, the Proposed Modification would be consistent with Actions 3.1, 3.2 and 3.3 of the Plan.

3.2 COMMUNITY VIEWS

Section 5.2 provides an overview of the community engagement that has been undertaken by the Proponent and Alkane in relation to the Mine, the Proposed Modification and associated activities. In summary, no issue or concerns have been received in relation to the Proposed Modification. Indeed, a number of community members expressed surprise that a modification was required at all.

3.3 ECONOMIC AND SOCIAL TRENDS

The Australian Bureau of Statistics⁴ provided a range of data in relation to economic and social trends within the Dubbo Statistical Area. This area includes the towns of Narromine, Dubbo, Wellington, Gilgandra and Coonabarabran, as well as the village of Tomingley. That data identifies the following economic and social trends surrounding the Mine Site.

- Industry - agriculture is an important industry employing 10.8% of the workforce in 2016, down from 11.3% in 2011. Mining, while employing 1.1% of the workforce in 2016, up from 0.9% in 2011 in an important and growing contributor to the economy. As a result, the Proposed Modification would continue to support the local economy through the provision of jobs in this important industry.
- Income – the median income, excluding welfare payments, within the Dubbo Statistical Area was \$44,078 in 2016. This compares with substantially higher salaries paid by the Proponent to its workers, the majority of whom live locally. As a result, the Proposed Modification would continue to support the local economy through the provision of wages and other benefits.

Anecdotally, the Proponent understands that the ongoing drought is having a significant impact on rural communities surrounding the Mine Site, including reduced employment, consumption and economic activity and the associated social impacts that that entails. The Proposed Modification would ensure that the Proponent is able to continue to employ local workers and contribute to a local, diverse economy. Should the Proponent cease to operate the mine when the currently approved Residue Storage Facility is at capacity, there would be substantial economic and social disruption.

⁴URL - https://itt.abs.gov.au/itt/r.jsp?RegionSummary®ion=10503&dataset=ABS_REGIONAL_ASGS2016&geoconcept=ASGS_2016&measure=MEASURE&datasetASGS=ABS_REGIONAL_ASGS2016&datasetLGA=ABS_REGIONAL_LGA2018®ionLGA=LGA_2018®ionASGS=ASGS_2016 – Accessed 4 December 2019

3.4 ENVIRONMENTAL TRENDS

The Proponent notes that the ongoing drought is having a substantial impact on the natural environment surrounding the Mine Site. However, the Proposed Modification would not result in disturbance of additional undisturbed land or significant additional groundwater, surface water, air quality or other impacts (see Section 6).

3.5 STRATEGIC SUPPORT FOR THE PROJECT

In light of the above, the Proponent contends that there is strong strategic support for the continued operation of the Mine and, therefore, for the Proposed Modification which would permit continued operation until the currently approved end of life on 31 December 2022.

4. STATUTORY CONTEXT

4.1 POWER TO GRANT APPROVAL

At the time of the approval of PA 09_0155, State Environmental Planning Policy (Major Development 2005) identified the Mine as a Major Project for which project approval under Part 3A of the EP&A Act was required. On 31 August 2018, the Mine was transitioned to a State Significant Development by a notice published in the NSW Government Gazette. As a result, this application is therefore made under Section 4.55(2) of the *Environmental Planning and Assessment Act 1979*. Section 4.5 addresses the matters that the consent authority is required to take into consideration under that Section.

4.2 CONSENT AUTHORITY

In accordance with Clause 8A(1) of the *State Environmental Planning Policy (State and Regional Development) 2011* if any of the following criteria are exceeded the consent authority is the Independent Planning Commission.

- Narromine Shire Council provides a submission objecting to the application.
- Objections are received from 25 persons or more.
- The Proponent has disclosed a reportable political donation of \$1,000 or more.

In the event that none of the above criteria are exceeded, the Minister for Planning is the consent authority. The Proponent understands that in these circumstances, the Minister has delegated their powers to determine the application to a senior officer of the Department of Planning, Industry and Environment.

4.3 PERMISSIBILITY

The Mine Site lies within land zoned RU 1 – Primary Production or, for those section of the Mine Site within the Newell Highway road reserve, SP2 Infrastructure, under the *Narromine Local Environment Plan 2011* (“Narromine LEP”).

All land that would be disturbed by the Proposed Modification is zoned RU1. Open cut mining is permissible with consent within that zone. Underground mining is permissible in accordance with Clause 7(1)(a) of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*.

4.4 OTHER APPROVALS

Table 7 presents the existing approvals held for the Mine and identifies where modifications to those approvals would be required or where new approvals would be necessary.

Table 7
Existing and Additional Approvals

Approval	Modification/ New Approval Required?	Justification/ Comment
EPL20169	No	No changes to scheduled activities
ML1684	No	No changes to mining operations. However, an amended MOP will be required prior to commencing Stage 7 of the Residue Storage Facility or importing waste rock from the proposed exploration decline.
Groundwater 80BL24528 – 80BL24532, 80BL620426 (monitoring bores)	No	Existing bores will remain in use and no additional bores are required
Controlled Works Approval (boundary diversion structure) 80CW809661	No	No changes to the approved diversion
Water Supply Works and Water Use Approval 80CA719513 / WAL 35321 (Upper Bogan River Water Source – 22ML/year)	No	No changes to the proposed water supply system
Groundwater Works Approval 80WA705442 (Lower Macquarie Zone 6 Groundwater Source)	No	No changes to the proposed water supply system
Water Access Licence WAL20270 (1 000ML/year)	No	No changes to the proposed water supply system
Water Access Licence WAL28643 (NSW Murray Darling Basin Fractured Rock Aquifer) (220ML/year)	No	No changes to the proposed water supply system
Notification of Dangerous Goods NDG200150	No	No changes to chemical or reagent practices

4.5 PRE-CONDITIONS TO GRANTING APPROVAL

Table 8 presents the pre-conditions that apply to the Proposed Modification.

4.6 MANDATORY MATTERS FOR CONSIDERATION

Table 9 presents the mandatory matters for consideration that apply to the Proposed Modification.



Table 8
Preconditions to the Granting of Approval

Section/ Clause	Precondition	Relevance
Environmental Planning and Assessment Act 1979		
4.55(2)	A consent authority may, ... modify the consent if (a) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified (if at all), and	As a former Part 3A Project, the relevant reference point for comparison is MOD3 of the Project. The Proposed Modification would be substantially the same as the MOD3 Project for the following reasons. • The modified Residue Storage Facility would be 6m higher and approximately 5ha larger than the approved Residue Storage Facility. • Importation of an additional approximately 335,000t of waste rock and 20,000t of bulk sample would be insignificant when compared to the volume of a waste rock and ore already mined (28Mt and 6.3Mt respectively – See Table 1) and that would be mined prior to the end of the mine life. • All other aspects of the Mine would remain as approved, in particular the ongoing mining areas, mining rate and life of the mine would remain as approved.
	(b) it has consulted with the relevant [government authorities]	This is a matter for the Department of Planning, Industry and Environment
	(c) it has notified the application in accordance with— i) the regulations, if the regulations so require, or ii) [not relevant]	This is a matter for the Department of Planning, Industry and Environment
	(d) it has considered any submissions made ...	This is a matter for the Department of Planning, Industry and Environment, however, the Proponent anticipates preparing a Submissions Report to provide a response to any submissions received.

Table 9
Mandatory Matters for Consideration

Page 1 of 7

Section/ Clause	Matter for Consideration	Relevance/Comment
Environmental Planning and Assessment Act 1979		
1.3	Relevant objects of the Act	The Proposed Modification would promote the social and economic welfare of the community by permitting extraction of a known, State-owned resource, with the associated economic benefits to the community and State. The Proposed Modification would also facilitate exploration for mineral deposits that may be the subject of future mining operations. These benefits would be achieved without additional adverse social or environmental impacts
	to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,	
	to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,	Section 7.2 addresses matters relevant to Ecologically Sustainable Development
	to promote the orderly and economic use and development of land,	The Proposed Modification would be undertaken in an orderly way to maximise the economic benefit to the community and State while minimising other adverse outcomes.
4.15	to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,	The Proposed Modification would not result in significant adverse environmental outcomes. Section 6 presents a detailed analysis of the key environmental aspects that may be affected by the Proposed Modification.
	Relevant environmental planning instruments	See Mining SEPP, SEPP44 and Narromine LEP below
	Relevant development control plans	Nonrelevant
	Any planning agreement	A Planning Agreement exists between the Proponent and Narromine Shire Council, including the following terms. Recurring payments are subject to CPI increases from 2013/2013. All payments continue until 31/12/2022. - Community contribution.....\$53,750pa - Road maintenance\$45,000pa - Council environmental expertise\$20,000pa - Water supply study \$30,000 to \$50,000 - Raw water for Tomingley village2MLpa - Transfer water infrastructure at end of life The Proponent does not propose to amend the Planning Agreement





Table 9 (Cont'd)
Mandatory Matters for Consideration

Section/ Clause	Matter for Consideration	Relevance/Comment
<i>Environmental Planning and Assessment Act 1979 (Cont'd)</i>		
4.15 (Cont'd)	The regulations	The Regulations have been considered throughout this document.
	The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,	Section 6 presents an assessment of relevant impacts on the natural and built environment and social and economic impacts.
	The suitability of the site for the development,	The Mine Site is an approved Mine and is suitable for the development
	Any submissions made in accordance with this Act or the regulations,	This is a matter for Department of Planning, Industry and Environment, however, the Proponent anticipates preparing a <i>Submissions Report</i> following completion of the exhibition period.
	The public interest.	This is addressed in Section 7.8. In summary, however, the Proponent contends that the Proposed Modification is in the public interest
<i>State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007</i>		
12AB	Non-discretionary development standards for mining <u>Cumulative noise level.</u> The development does not result in a cumulative amenity noise level greater than the acceptable noise levels, as determined in accordance with Table 2.1 of the Industrial Noise Policy, for residences that are private dwellings	No changes to the approved noise emissions are anticipated.
	<u>Cumulative air quality level.</u> The development does not result in a cumulative annual average level greater than 30µg/m ³ of PM ₁₀ for private dwellings.	No changes to the approved dust emissions are anticipated.

Table 9 (Cont'd)
Mandatory Matters for Consideration

Page 3 of 7

Section/ Clause	Matter for Consideration	Relevance/Comment
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Cont'd)		
12AB (Cont'd)	<u>Airblast overpressure.</u> Airblast overpressure caused by the development does not exceed: (a) 120 dB (Lin Peak) at any time, and (b) 115 dB (Lin Peak) for more than 5% of the total number of blasts over any period of 12 months, measured at any private dwelling or sensitive receiver.	Open cut blasting operations have ceased and no airblast overpressure impacts would occur
	<u>Ground vibration.</u> Ground vibration caused by the development does not exceed: (a) 10mm/sec (peak particle velocity) at any time, and (b) 5mm/sec (peak particle velocity) for more than 5% of the total number of blasts over any period of 12 months, measured at any private dwelling or sensitive receiver.	No changes to the approved ground vibration emissions are anticipated
	<u>Aquifer interference.</u> Any interference with an aquifer caused by the development does not exceed the respective water table, water pressure and water quality requirements specified for item 1 in columns 2, 3 and 4 of Table 1 of the Aquifer Interference Policy for each relevant water source listed in column 1 of that Table.	No significant changes to the approved groundwater and aquifer interference impacts are anticipated
12	Consideration is given to: the existing uses and approved uses of land in the vicinity of the development;	The existing and approved use of the Mine Site is Mining. The Proposed Modification is consistent with that use. Surrounding land uses include residential and rural land uses and the Mine has co-existed with those uses since 2013.





Table 9 (Cont'd)
Mandatory Matters for Consideration

Section/ Clause	Matter for Consideration	Relevance/Comment
<i>State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Cont'd)</i>		
12 (Cont'd)	the potential impact on the preferred land uses (as considered by the consent authority) in the vicinity of the development; and	Section 6 presents an assessment of relevant impacts on the natural and built environment and social and economic impacts surrounding the Mine Site. The Proposed Modification would not significantly impact on those land uses.
	any ways in which the development may be incompatible with any of those existing, approved or preferred land uses.	The Proposed Modification would not be inconsistent with existing land use within the Mine Site and would therefore not be incompatible with surrounding land uses.
	The respective public benefits of the development and the existing, approved or preferred land uses are evaluated and compared.	The Proposed Modification would permit the continued operation of the Mine until the approved end of life on 31 December 2022. The public benefit of the Proposed Modification would not adversely impact on the public benefit associated with the surrounding residential and rural land uses.
	Measures proposed to avoid or minimise any incompatibility are considered.	Section 2 and 6 present measures proposed to avoid or minimise any incompatibility.
13	Consideration is given to whether the development is likely to have a significant impact on current or future mining, petroleum production or extractive industry and ways in which the development may be incompatible. Measures taken by the Proponent to avoid or minimise any incompatibility are considered. The public benefits of the development and any existing or approved mining, petroleum production or extractive industry must be evaluated and compared.	Clause 13 is not considered relevant on the basis that the Mine has already been approved and as such the compatibility of the Mine with other mining, petroleum production or extractive industry has already been considered
14	Consideration is given to ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure: impacts on significant water resources, including surface and groundwater resources, are avoided or minimised;	Sections 6.3 and 6.4 address matters related to surface water and groundwater respectively.

Table 9 (Cont'd)
Mandatory Matters for Consideration

Page 5 of 7

Section/ Clause	Matter for Consideration	Relevance/Comment
<i>State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Cont'd)</i>		
14 (Cont'd)	impacts on threatened species and biodiversity are avoided or minimised; and	Section 6.5 addresses matters related to biodiversity.
	greenhouse gas emissions are minimised and an assessment of the greenhouse gas emissions (including downstream emissions) of the development is provided.	Section 6.8 addresses matters related to air quality.
15	The efficiency of resource recovery, including the reuse or recycling of material and minimisation of the creation of waste, is considered	The Proposed Modification would ensure that the maximum benefit is obtained from a State-owned resource within the approved life of the Mine.
16	The following transport-related issues are considered. - The transport of some or all of the materials from the site by means other than public road. - Limitation of the number of truck movements that occur on roads within residential areas or roads near to schools. The preparation of a code of conduct for the transportation of materials on public roads.	The Proposed Modification would not change or impact on transport-related matters.
17	The rehabilitation of the land affected by the development is considered including: - the preparation of a plan that identifies the proposed end use and landform of the land once rehabilitated; - the appropriate management of development generated waste; - remediation of any soil contaminated by the development; and - the steps to be taken to ensure that the state of the land does not jeopardize public safety, while being rehabilitated or at the completion of rehabilitation.	The Proposed Modification would not materially change the approved rehabilitation to be undertaken. A new or amended MOP would be submitted for approval following receipt of development consent.





Table 9 (Cont'd)
Mandatory Matters for Consideration

Section/ Clause	Matter for Consideration	Relevance/Comment
State Environmental Planning Policy No 44—Koala Habitat Protection		
5	Land to which the Policy applies	The Narromine Local Government Area is identified in Schedule 1 of the SEPP. As a result, the SEPP is relevant
7	Step 1—Is the land potential koala habitat?	The Proposed Modification would not disturb any land that may be considered potential or core Koala habitat.
Narromine Local Environmental Plan 2011		
6.4	(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider whether or not the development—	Section 6.5 addresses matters related to biodiversity.
	a) is likely to have any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and	The Proposed Modification would not have any adverse impact on the condition, ecological value and significance of fauna and flora
	b) is likely to have any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna, and	The Proposed Modification would not have any adverse impact on the importance of the vegetation to the habitat and survival of native fauna
	c) has any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and	The Proposed Modification would not fragment, disturb or diminish the biodiversity structure, function and composition of the area to be disturbed
	d) is likely to have any adverse impact on the habitat elements providing connectivity on the land.	The Proposed Modification would not have any adverse impact on the habitat elements providing connectivity on the land
	(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that—	
	a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or	The Proposed Modification would not disturb any land that has not already been disturbed.

Table 9 (Cont'd)
Mandatory Matters for Consideration

Section/ Clause	Matter for Consideration	Relevance/Comment
<i>Narromine Local Environmental Plan 2011 (Cont'd)</i>		
6.4 (Cont'd)	b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or	Not relevant
	c) if that impact cannot be minimised—the development will be managed to mitigate that impact.	Not relevant
<i>Biodiversity Conservation Act 2016</i>		
7.14(2)	The Minister for Planning, when determining in accordance with the Environmental Planning and Assessment Act 1979 any such application, is to take into consideration under that Act the likely impact of the proposed development on biodiversity values as assessed in the biodiversity development assessment report. The Minister for Planning may (but is not required to) further consider under that Act the likely impact of the proposed development on biodiversity values	An assessment of Biodiversity impacts is presented in Section 6.5.

5. ENGAGEMENT

5.1 GOVERNMENT AGENCY CONSULTATION

Department of Planning, Industry and Environment

The Proponent consulted with Department of Planning, Industry and Environment (DPIE) during preparation of this Modification Report. In particular, a Letter Report outlining the Proposed Modification was provided on 27 September 2019. This was followed by a teleconference with the Department on 16 October 2019. During that teleconference the following matters were raised.

- Justification of the Proposed Modification.

DPIE requested further clarification why a statement in the original application that the Residue Storage Facility as approved had adequate capacity for the life of the Mine. The Proponent agreed to provide a summary of the growth of the Ore Reserves, production to 30 June 2019 and planned production to the approved end of the life of the Mine on 31 December 2022.
- The parties agreed that the application would be assessed under Section 4.55(2) of the *Environmental Planning and Assessment Act 1979*.

Further correspondence was provided on 22 October 2019 and Mr Bland of RWC and DPIE discussed Proposed Modification on 23 October and 7 November. During those conversations, Mr Bland agreed to provide the information presented in Section 1.3 of this document. A draft copy of the information presented in that section was provided to DPIE on 22 December 2019 and a follow teleconference was held on 16 January 2020.

Formal correspondence from the Department was received on 20 January 2020 requesting the information presented in **Table 10** be included in this Modification Report.

Table 10
DPIE Requested Information

Requested information	Where addressed
Clear and detailed justifications for increasing the RSF, including information on the available mineral resources and how the remaining ore resources were estimated.	Sections 1.2 and 1.3
A table summarising previous modifications to the original project approval and the proposed modification, outlining clearly the changes made to the project	Appendix 1
Description and assessment of disposal of waste from the exploration decline works within your exploration licence (EL) area within the approved project site (within underground operations or waste rock emplacement areas).	Section 2.3

Narromine Shire Council

The Applicant meets regularly with Narromine Shire Council and associated individuals and organisations, including on 17 December, 13 November, 8 November, 17 July, 8 July and previously. During each of these conversations a range of matters related to the Mine were discussed, including the Proposed Modification. No concerns or issues were raised during this consultation.

Environment Protection Authority (EPA)

Mitchell Bland of RWC spoke the EPA via telephone on 14 January 2020. A range of matters were discussed, including the Proposed Modification. The EPA requested clarification in relation to the Residue Storage Facility liner. Mr Bland advised that the liner was constructed and tested to comply with the EPA's liner policy and that as the Proposed Modification would involve upstream lifts, no additional liners would be required. Mr Bland also advised that monitoring has indicated that there is no evidence of seepage from the existing Facility.

The EPA indicated that there were no additional matters that they required to be addressed and that they would wait for the Modification Report to be submitted for assessment.

Transport for NSW (TfNSW)

A range of meetings and email exchanges between the Applicant, Alkane, RWC and TfNSW between September 2019 and finalisation of this document. This consultation addressed a range of matters related to the Mine. On 10 February 2020, Mr Bland of RWC provided TfNSW with an update specifically in relation to the Proposed Modification and the matters addressed in the Modification Report. TfNSW indicated that there were no additional matters that they required to be addressed in the document.

Other agencies

The Alkane and RWC attempted to make contact with the Natural Resource Access Regulator and the Biodiversity Conservation Division in relation to the Mine on a number of occasions, including on 22 December 2019 (by email) and 14 January 2020 (by telephone) with no responses received.

5.2 COMMUNITY CONSULTATION

The Proponent and Alkane has engaged in extensive community consultation in relation to its activities within the Mine Site, as well as the associated activities described in Section 1.2.3. That consultation has included the following.

- Community newsletters.

Community Newsletters 18, 19 and 20 were released in February, August and November 2019 (available at <http://www.alkane.com.au/projects/tomingley-gold-operations/community-resources/tgo-community-newsletter/>). Each newsletter provided an update on the Project status and the Proponent's work to extend and continue the life of the Mine.

- Community Consultative Committee

The Community Consultative Committee met on four occasions in 2019, namely on 21 February, 23 May, 22 August and 16 November. The Proposed Modification was raised at the February and May meetings and no concerns or issues were raised

- Face to face meetings

The Proponent has met face to face with surrounding landholders on at least 70 occasions between 20 March 2019 and 30 January 2020 to discuss a range of

matters related to the Mine, including activities intended to support the ongoing operation of the Mine. During these meetings, no concerns or issues with the Proposed Modification were raised.

- **Ad-hoc community engagement**

Throughout 2019 and early 2020, the Proponent and Alkane have engaged with the community through a range of ad-hoc meetings and interactions, including the following where representatives spent several hours on each occasion fielding questions from the public

- 27 April 2019 – Tomingley Picnic Races (sponsored by Alkane).
- 25 May 2019 – Dubbo Show.

The Proponent and Alkane also met with residents of Tomingley and surrounds at various public events and social occasions. No concerns or issues with the Proposed Modification were raised during these interactions.

6. ASSESSMENT OF IMPACTS

6.1 INTRODUCTION

This section provides an assessment of the impacts associated with those features of the local environment which could potentially be affected by the Proposed Modification. The proposed design and/or operational safeguards and an assessment of the level of impact the Proposed Modification may have after implementation of these safeguards is also described. This Section also presents those environmental aspects that would not be impacted by the Proposed Modification and a justification for why that is the case. Those aspects are not assessed in further detail in this document.

6.2 NOISE

6.2.1 Local Setting and Environmental Performance

The original application for Project Approval was supported by a noise and blasting assessment prepared by SLR, referred to hereafter as SLR (2011).

The Mine Site is located immediately south of the village of Tomingley. As a result, numerous residences occur immediately to the north of the Mine Site. Within the agricultural land to the east, south and west of the Mine Site, residences are more widely spaced.

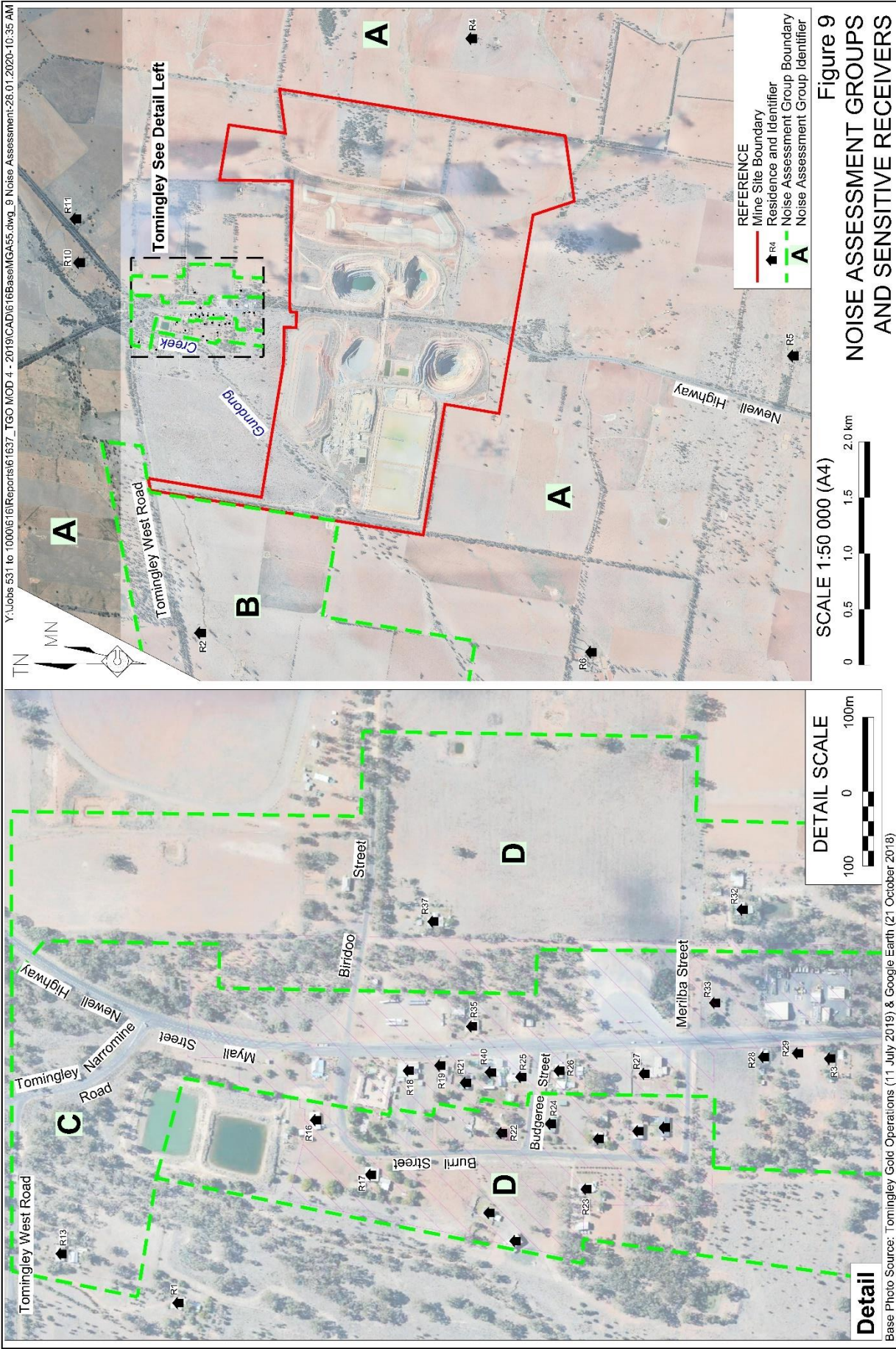
SLR (2011) identified four noise assessment groups (NAG) surrounding the Mine Site as follows (Figure 9).

- NAG A: ambient noise influenced by both local roads and Newell Highway (Residences R1, R4, R5, R6, R8, R9, R10, R11 and R12).
- NAG B: rural setting with minimal traffic noise influence (Residence R2).
- NAG C: ambient noise highly elevated due to Newell Highway (Residences R3, R13, R18, R19, R21, R24, R25, R26, R27, R28, R29, R33, R35 and R40).
- NAG D: ambient noise elevated due to Newell Highway (Residences R16, R22, R17, R23, R32 and R37).

Table 11 presents the noise compliance criteria identified in Condition 3A of Schedule 3 of PA09_0155.

Table 11
Noise Compliance Criteria

Noise Assessment Group	Intrusive (Project-specific) Noise Criteria ($L_{Aeq}(15\text{minute})$)		
	Day ²	Evening	Night
A	35	35	35
B	36	35	35
C	45	35	35
D	43	38	36
All other receivers	35	35	35



The Proponent has engaged Muller Acoustic Consulting (MAC) to undertake monthly noise monitoring. MAC advise that there have been no non-compliances with the relevant compliance criteria since April 2016 when MAC commenced monitoring.

6.2.2 Management and Mitigation Measures

The Proponent would continue to implement the following relevant management and mitigation measures.

- Continue to implement the approved *Noise Management*.
- Utilise frequency modulated reversing alarms on all mobile equipment.
- Ensure noisy equipment is operated in exposed locations, such as on top of the acoustic bunds or in close proximity to residences, during the daytime only and preferentially when the wind is blowing from the northwest, north or northeast.
- Ensure that the front-end loader on the ROM Pad is operated to the south of stockpiled ore or purpose-built earth bunds.
- Continue to monitor real-time noise levels at various locations surrounding the Mine Site.
- Continue to use meteorological forecasting information to identify periods of noise enhancing conditions such as inversions or noise enhancing winds. To inform planning of surface activities.

6.2.3 Assessment of Impacts

The Proponent contends that the Proposed Modification would have a negligible impact on the surrounding noise environment for the following reasons.

- Construction of Stages 7 to 9 of the Residue Storage Facility would be undertaken using similar processes to those used for construction of Stages 1 to 6.
- Attended noise monitoring during construction of Stage 5 and Stage 6 of the Residue Storage Facility indicated no exceedance of the noise compliance criteria.
- An increase in elevation of noise sources of up to 6m only isw unlikely to materially increase construction-related noise emissions when compared with Stages 5 and 6.
- Operation of the modified Residue Storage Facility would be no noisier than operation of the approved Residue Storage Facility.
- Surface operations since the cessation of open cut mining in January 2019 have been substantially reduced. As a result, overall noise emissions from the Mine Site are substantially less than those approved.

6.3 SURFACE WATER

6.3.1 Local Setting and Environmental Performance

The Proponent manages surface water within the Mine Site based on the following classification.

- Clean water – water unaffected by mining operations. Clean water is permitted to flow around and through the Mine Site via dedicated clean water diversions and is discharged to natural drainage.
- Dirty water – water with the potential to contain suspended sediment from disturbed sections of the Mine Site. Dirty water is captured and stored in sediment basins prior to treatment and discharge or transfer to other storages within the Mine Site.
- Raw water – water pumped to site for use for mining-related activities. This water is not permitted to be discharged from the Mine Site.
- Mine water – water removed from the underground mine workings or stored within the open cuts. This water is not permitted to be discharged from the Mine Site.
- Process water – water potentially contaminated with chemicals, including decant water with the Process Water Dam, Wyoming Central Dam and the Residue Storage Facility. This water is not permitted to be discharged from the Mine Site.

Soils within the Mine Site are highly dispersive and there have been a number of unplanned discharges of dirty water resulting from erosion of the clean water diversions within the Mine Site. Each event has been reported to the Environment Protection Authority and the Proponent has invested substantial funds to remediate and rectify the issue.

No discharge of Mine or Process Water from the Mine Site has occurred.

6.3.2 Management and Mitigation Measures

The Proponent would continue to implement the following relevant management and mitigation measures.

- Continue to implement the approved *Water Management Plan*.
- Maintain clean and dirty water diversions and sediment basins in accordance with the requirements of *Managing Urban Stormwater*.
- Ensure that Mine and Process Water are not permitted to be discharged from the Mine Site.
- Ensure that Dirty Water is only discharged from licenced discharge points following treatment and testing and only once the water quality criteria identified in EPL20169 have been achieved.
- Ensure that water is transferred from storage dams to other storages within the Mine Site as described in Table 2.1 of the *Water Management Plan*.

6.3.3 Assessment of Impacts

The Proponent contends that the Proposed Modification would have a negligible impact on the surrounding surface water environment for the following reasons.

- There would be no change to the approved water management system as described in the *Water Management Plan*. In particular, decant water from the Residue Storage Facility would continue to flow or be pumped to the Process Water dam or the Wyoming Central Dam. The Proposed Modification would not result in an increased risk of discharge of surface water from the Mine Site.
- There would be no change in the approved water balance or level of water consumption.
- There would be no change in the quality or quantity of surface water downstream of the Mine Site, or the risk of discharge of contaminated water.

6.4 GROUNDWATER

6.4.1 Local Setting and Environmental Performance

The Conceptual Groundwater Model for the Mine Site includes three distinct aquifers as follows.

- **Shallow alluvium**
Shallow alluvium (less than 10m to 20m deep) dissects the plains surrounding the Mine site along creek flow paths. While not observed to be continuous across the Mine Site, the alluvium appears to be more persistent along Gundong Creek. These aquifers are recharged from rainfall infiltration. Groundwater is of relatively good quality, however, yields are relatively low and dependent on rainfall.
- **Deep alluvium**
Occurring as alluvial / sandy clay and saprolite clay up to 70m deep in the vicinity. The hydraulic conductivity of the upper clay is generally low to very low with DE Cooper & Associates (2011) reporting hydraulic conductivities of 2.3×10^{-8} to 10^{-9} m/s from falling head tests. Groundwater yields are low and of poor quality. These systems may have some interaction with underlying bedrock, however, are believed to be primarily recharged from rainfall.
- **Fractured rock**
The area surrounding Tomingley is typically underlain by shale, siltstone and chert with several fractured rock aquifers in the vicinity of the Mine Site (up to 100m below the deep alluvium layer). Groundwater yields range from nil to 3L/s, generally less than 1.5L/s, and water quality is poor with high salinity (electrical conductivities up to approximately 30 000µS/cm). This groundwater would be classified as less productive fractured rock groundwater under the NSW Aquifer Interference Policy.

Regional groundwater monitoring is undertaken at seven locations within and surrounding the Mine Site. The 2018 Annual Review (TGO, 2018) identified that groundwater levels and quality within the monitored bores is not affected by mining-related activities.

In addition, shallow groundwater in the vicinity of the Residue Storage Facility is monitored in 10 shallow piezometers located at the toe of the Residue Storage Facility. GHD (2019) undertook a review of that data, and the results may be summarised as follows.

- Groundwater chemistry results did not indicate geochemical changes in shallow groundwater consistent with influence from residue decant water.
- Groundwater levels in the vicinity of the Residue Storage Facility increased independently of rainfall since commencement of the Mine. GHD (2019) indicated that this was unlikely to be a result of seepage from the Residue Storage Facility. Rather the increase was attributed to one or more of the following.
 - Recovery of groundwater levels following construction of the surface facilities area.
 - The bulk mass of residue within the Residue Storage Facility resulting in compression of the underlying aquifer and increasing groundwater levels around the perimeter.
 - Seepage from nearby sediment basins.

6.4.2 Management and Mitigation Measures

The Proponent would continue to implement the following relevant management and mitigation measures.

- Continue to implement the approved *Water Management*.
- Continue to monitor groundwater levels and quality in bores and piezometers with and surrounding the Mine Site and review resulting data to determine if the approved or proposed activities are adversely impacting on groundwater levels or quality.
- Implement the Trigger Action Response Plans identified in Section 8.2 of the *Water Management Plan*.

6.4.3 Assessment of Impacts

As identified in Section 2.2.6, GHD (2019) determined that the Proposed Modification would not result in a significant change in the seepage rate from the Residue Storage Facility. In addition, groundwater monitoring has indicated that the Residue Storage Facility is not currently resulting in seepage to groundwater. As a result, the Proposed Modification is not expected to result in significant impacts to groundwater in the vicinity of the Mine Site.

6.5 BIODIVERSITY

6.5.1 Local Setting and Environmental Performance

Figure 10 presents the vegetation communities within the Mine Site. In summary, the Mine Site includes seven vegetation communities, including the following communities classified at that time as Endangered Ecological Communities.

- Community 1: Benson 76 – Inland Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams (six remnants totalling 36.9ha). This community is a component of the NSW Inland Grey Box Woodland EEC.
- Community 3: Benson 201 – Fuzzy Box – Inland Grey Box on alluvial brown soils (five main remnants totalling 6.0ha). This community is a component of a Fuzzy Box on Alluvials EEC.

In particular, it is noted that Community 1 (Benson 76) is located to the south and west of the approved Residue Storage Facility.

Figure 11 presents the Proponent's approved biodiversity offset strategy. In summary, the strategy includes preservation and augmentation of a number of areas within the Mine Site. In particular, it is noted that a section of land including Community 1 (Benson 76) is located immediately to the west of the approved Residue Storage Facility.

6.5.2 Management and Mitigation Measures

The Proponent would continue to implement the following relevant management and mitigation measures.

- Continue to implement the approved *Biodiversity Management Plan*, including the approved Biodiversity Offset Strategy.
- Ensure that ground disturbing activities are limited to the approved areas and that no native vegetation is disturbed during construction of Stages 7 to 9 of the Residue Storage Facility.
- Continue to undertake annual monitoring of biodiversity within the Mine Site.

6.5.3 Assessment of Impacts

Plates 1 and 2 present photographs of the southern and western disturbance footprints of the proposed enlarged Residue Storage Facility. As all areas that would be disturbed by the Proposed Modification are already disturbed and no native vegetation would be disturbed, a *Biodiversity Development Assessment Report* is not required⁵, and biodiversity impacts would be negligible. Notwithstanding the above, **Table 12** presents an assessment of biodiversity impacts that is broadly consistent with the format of Table 2 Attachment A of the Fact Sheet *Biodiversity development assessment report waiver determinations for SSD and SSI applications* dated November 2018.

⁵ Under Section 7.9(2) of the *Biodiversity Conservation Act 2016*.



**Plate 1 View of indicative additional disturbance area (blue) from southwest corner of the Residue Storage Facility looking east
(Ref: Client Supplied 10 February 2020)**



**Plate 2 View of indicative additional disturbance area (blue) from southwest corner of the Residue Storage Facility looking north
(Ref: Client Supplied 10 February 2020)**

Table 12
Effect on Biodiversity Values

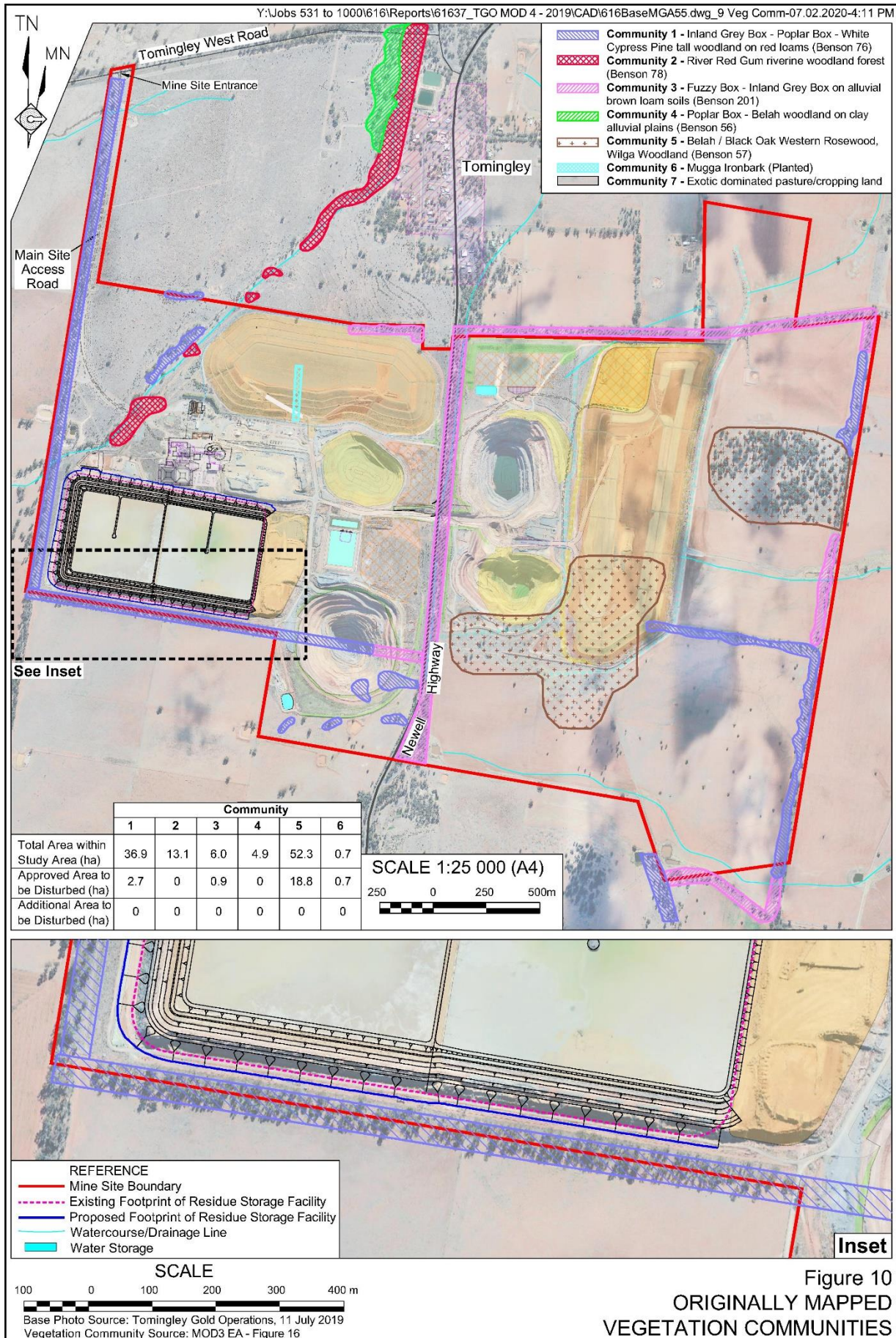
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Biodiversity Values	Meaning	Relevant?	Modification interaction with biodiversity values
Vegetation integrity	Degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state	No	The Proposed Modification would disturb an additional approximately 5ha of previously disturbed land. The impacts of the Project on the vegetation integrity and biodiversity value of the area were assessed in the original application for Project Approval. The Proposed Modification would neither increase nor reduce these assessed potential impacts.
Vegetation abundance	Occurrence and abundance of vegetation at a particular site	No	Figure 10 presents the vegetation communities mapped during preparation of the original application for Project Approval. The Proposed Modification would not disturb native vegetation as originally mapped and would neither increase nor reduce the originally assessed biodiversity impacts.
Habitat suitability	Degree to which the habitat needs of threatened species are present at a particular site	No	The proposed area of additional disturbance includes no habitat suitable for threatened species. Indirect impacts on threatened species habitat, in particular the Inland Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams (Benson 76) located adjacent to the Residue Storage Facility (Figure 10), would be no greater than existing, approved impacts. The Proposed Modification would not disturb native vegetation and would neither increase nor reduce the assessed biodiversity impacts.
Threatened species abundance	Occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular site	No	The Proposed Modification would not disturb native vegetation, including endangered ecological communities. The Proposed Modification would not directly disturb threatened fauna or flora species. As a result, the Proposed Modification would neither increase nor reduce impacts on threatened species or threatened ecological community abundance.
Habitat connectivity	Degree to which a particular site connects different areas of habitat of threatened species to facilitate the movement of those species across their range	No	The Proposed Modification would not disturb native vegetation or habitat of threatened species. As a result, habitat connectivity would neither increase nor reduce as a result of the Proposed Modification and there would be no impact on movement of species across their range.

Table 12 (Cont'd)
Effect on Biodiversity Values

Page 2 of 2

Biodiversity Values	Meaning	Relevant?	Modification interaction with biodiversity values
Threatened species movement	Degree to which a particular site contributes to the movement of threatened species to maintain their lifecycle	No	The proposed area of disturbance is devoid of native vegetation and does not contribute to the movement of threatened species. In this regard, the modification would neither increase nor reduce impacts on threatened species movement that maintains the species' lifecycle compared to the approved impacts.
Flight path integrity	Degree to which the flight paths of protected animals over a particular site are free from interference	No	The Proposed Modification would result in an increase in the height of the Residue Storage Facility of 6m from 280.5m AHD to 286.5m AHD. The adjacent Waste Rock Emplacement 1 has an approved maximum elevation of 310m AHD. As a result, the Proposed Modification would neither increase nor reduce the ability of threatened animals to use particular flight paths.
Water sustainability	Degree to which water quality, water bodies and hydrological processes sustain threatened species and threatened ecological communities at a particular site	No	The Proposed Modification would not alter existing, approved water management procedures and systems. Water within the modified Residue Storage Facility would be managed in the same manner as water within the existing Facility. In addition, there would be no changes to management of water surrounding the Residue Storage Facility, either during its operation or following closure. Given the above, the proposed modification will neither increase nor reduce impacts on water sustainability for threatened species or threatened ecological communities.



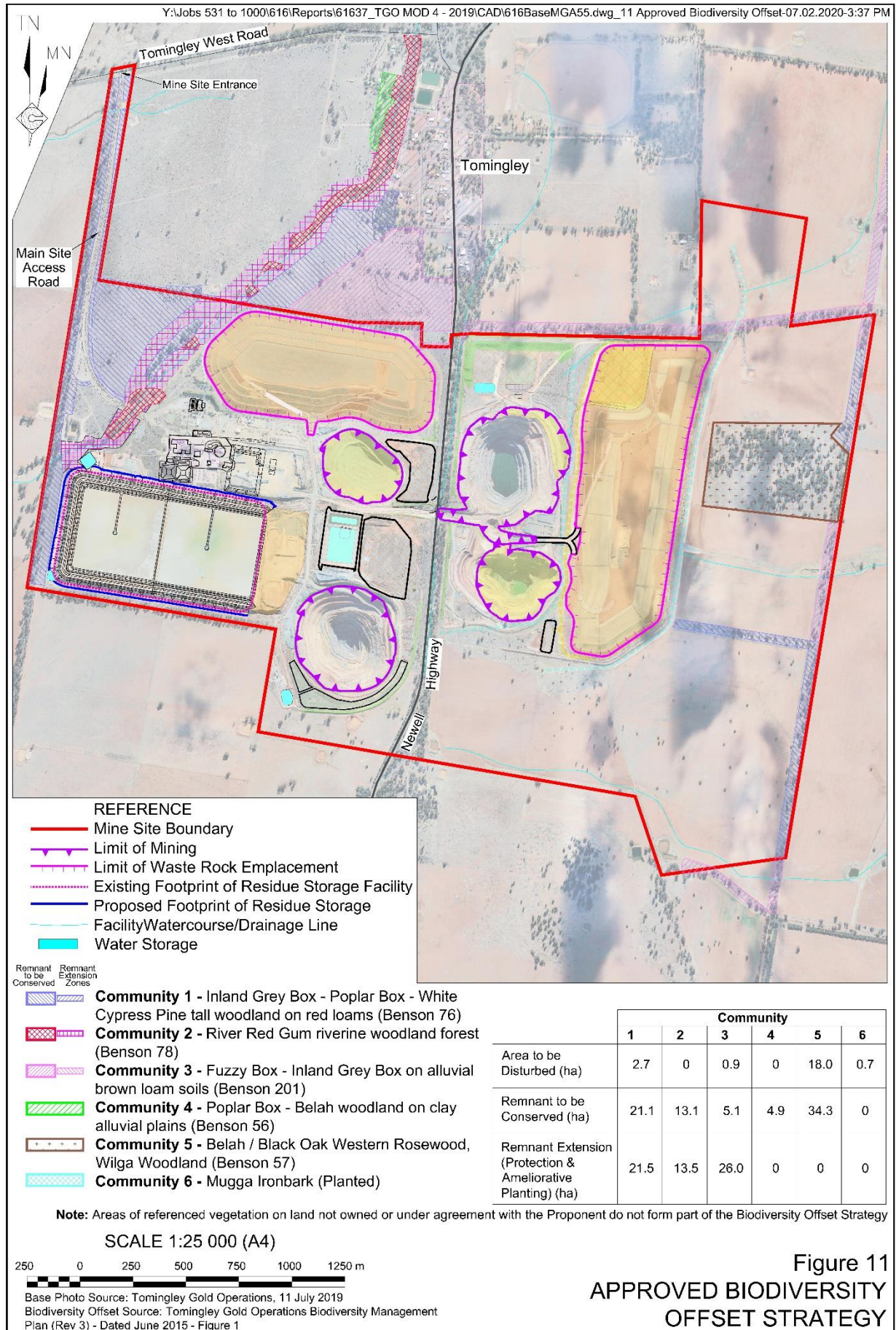


Figure 11
APPROVED BIODIVERSITY
OFFSET STRATEGY

6.6 VISUAL AMENITY

6.6.1 Local Setting and Environmental Performance

With the exception of the Mine Site, the existing visual amenity surrounding the Mine Site is typical of rural areas in the central west of NSW, with the outlook from most rural residences and other vantage points including land used for agriculture, transportation or other infrastructure, as well as remnant native vegetation. Outlooks from residences within the village of Tomingley include views of surrounding buildings, established trees and smaller vegetation and the Newell Highway and other local roads.

Notwithstanding the above, the approved Mine is prominent within the visual landscape in close proximity the Mine Site, however, at greater distances, the Mine Site is typically obscured by intervening vegetation.

The Residue Storage Facility is primarily visible from the south to the northwest, with views from the north to the southeast obscured by Waste Rock Emplacement 1 and 2.

6.6.2 Assessment of Impacts

The Proponent contends that the proposed change to the visual amenity from surrounding vantage points would be negligible for the following reasons.

- The proposed 6m increase in the height of the Residue Storage Facility would be insignificant in comparison to the existing visual footprint of the Mine.
- The Residue Storage Facility is not visible from the north to the southeast.
- The closest residence to the Residue Storage Facility to the west is located at a distance of 1.75km. A 6m lift on the Residue Storage Facility would occupy 0.20° of view and is unlikely to be perceptible to most viewers.

6.7 SOCIAL AND ECONOMIC

6.7.1 Local Community and Economic Contributions

The Proponent has been operating the Mine since January 2014, but has been intimately involved in the surrounding community since the 1990's when it was operating the nearby Peak Hill Gold Mine. In summary, the communities surrounding the Mine Site includes the following.

- Residents of the village of Tomingley
The Proponent understands that approximately 30 people live in the village of Tomingley.
- Surrounding rural residences.
The area surrounding the Mine Site is a rural area with agricultural properties, typical with one or two houses on each property. These are typically occupied by residents who rely on the properties for some of all of their income.

- Surrounding villages and towns

The Mine Site is surrounded by a number of other villages and towns, including the following.

- Peak Hill, located approximately 18km to the south on the Newell Highway;
- Narromine, located approximately 38km to the north on the Tomingley – Narromine Road;
- Dubbo, located approximately 57km to the northeast on the Newell Highway; and
- Parkes, located approximately 67km to the south on the Newell Highway.

Approximately 127 of the Proponent's 133 staff live within the above towns or surrounding areas, contributing approximately \$10.3 million in total combined salaries and wages during the 2018/2019 financial year. In addition, during that period the Proponent spent between \$4 million and \$5 million with businesses based within the above towns and surrounding areas. As a result, the Proponent is a substantial contributor to the economy of the Orana Region.

6.7.2 Management and Mitigation Measures

The Proponent would continue to implement the following relevant management and mitigation measures.

- Engage the community surrounding the Mine Site in regular dialogue in relation to the ongoing operation of the Mine and maintain an “open door” policy for any member of the community who wishes to discuss any aspect of the Project.
- Proactively and regularly consult with those residents most likely to be adversely impacted by the Mine.
- Continue to support community organisations, groups and events, as appropriate, and review any request by a community organisation for support or assistance throughout the life of the Project.⁶
- Implement a comprehensive and targeted environmental monitoring program.⁷
- Actively engage with the existing Community Consultative Committee.⁸
- Advertise and maintain a community complaints telephone line (02 6865 6116).
- Give preference when engaging new employees, where practicable, to candidates who live within the Narromine, Dubbo or Parkes Local Government Areas.
- Encourage the involvement of the local Aboriginal community in the workforce.

⁶ Details in relation to the existing Tomingley Community Fund may be obtained from <http://www.alkane.com.au/projects/tomingley-gold-operations/community-resources/tgo-community-fund/>.

⁷ Details in relation to the ongoing environmental monitoring results may be obtained from <http://www.alkane.com.au/projects/tomingley-gold-operations/tgo-environment/environmental-reports/>.

⁸ Minutes of the committee's meetings and contact details for its members are available from <http://www.alkane.com.au/projects/tomingley-gold-operations/community-resources/consultative-committee/>

- Encourage and support participation of locally based employees and contractors in appropriate training or education programs that would provide skills and qualifications that may be of use following completion of the Project.
- Give preference, where practicable, to suppliers of equipment, services or consumables located within the Narromine, Dubbo or Parkes Local Government Areas.
- Assist community members and others, as appropriate, to establish complimentary businesses in the vicinity of the Mine Site.
- Assist surrounding Councils, namely the Narromine, Dubbo and Parkes Councils, to promote and encourage economic development.
- Make available excess water from the water supply bores and pipeline to Narromine Shire Council for supply to the residents of Tomingley.
- Ensure that infrastructure and services installed for the Project, including the water supply bores and pipeline, electricity transmission line, appropriate buildings and hardstand areas, remain available for alternative uses following completion of the Project (provided that such uses are consistent with the final land uses identified in this document or any subsequent approval).
- Encourage and support, in consultation with the local community, the provision of services to the community. These may include health, education, transportation and other services.
- Continue to manage weeds, pests and bushfire risks in consultation with surrounding land owners.

6.7.3 Assessment of Impacts

Clause 12 of the Mining SEPP (see **Table 9**) requires that consideration be given to:

- the existing uses and approved uses of land in the vicinity of the development;
- the potential impact on the preferred land uses (as considered by the consent authority) in the vicinity of the development; and
- any ways in which the development may be incompatible with any of those existing, approved or preferred land uses.

The Proposed Modification would not modify or be incompatible with existing, approved uses of land within or surrounding the Mine Site. In particular, the Proposed Modification would ensure that additional land, with potential alternative land uses, would not be disturbed to permit storage of the additional residue that will be produced prior to the end of the approved life of the Mine.

In addition, the Proposed Modification would ensure the ongoing operation of the Mine beyond the point at which the approved Residue Storage Facility could no longer accept further residue, nominally from mid-2020 until 31 December 2022, a period of 2 ½ years. This would ensure that the following benefits, based on actual payments for the 12 months to June 2019, would continue.

- Direct employment for approximately 133 people, with wages and salaries of approximately \$10.3 million per year.
- Injection of approximately \$4 million to \$5 million per year into the local and regional economy, with an additional of \$7 million to \$8 million into the State and Federal economies. This expenditure is likely to generate additional economic activity and flow on effects, providing further employment opportunities.
- Ongoing support for training and education of employees and others in the vicinity of the Mine Site, including the Aboriginal community.
- Continued support for local sporting and other organisations.

6.8 ENVIRONMENTAL ASPECTS WHICH WOULD BE UNAFFECTED

Table 13 presents the environmental aspects which would be unaffected by the Proposed Modification, and a justification for that conclusion.

Table 13
Environmental Aspects which would be Unaffected by the Proposed Modification

Environmental Aspect	Justification
Air quality	The Proposed Modification would not result in additional dust or greenhouse gas emissions because the proposed activities would be consistent with those already approved and undertaken onsite.
Aboriginal Heritage	The Proposed Modification would not result in disturbance of any land that has not already been disturbed. In addition, OzArk (2011) did not identify any objects of Aboriginal heritage significance in the vicinity of the Residue Storage Facility.
Non-Aboriginal Heritage	The Proposed Modification would not result in disturbance of any land that has not already been disturbed. OzArk (2011) identified a moveable heritage item, namely a Bedford truck from the 1940's with the words "Peak Perfection Cordials" on the passenger side of the truck. The badge on the car bonnet shows that the car was made in England. The truck is currently stored on site.
Blasting and vibration	The Proposed Modification would not result in any modification of the approved blasting operations.
Traffic and transportation	Transportation of waste rock and the bulk sample from the proposed exploration operations to the Mine Site would be undertaken via the proposed exploration decline. As a result, the Proposed Modification would not result in any modification of the approved transportation operations.
Soils and land capability	The Proposed Modification would not result in disturbance of any land that has not already been disturbed. In addition, the Proposed Modification would not result in and modification of the approved final land use or land capability, with the final Residue Storage Facility merely being 6m higher than currently approved.
Hazards	The Proposed Modification would not result in modification of the approved processing operations or management of hazardous materials

7. EVALUATION OF MERITS

7.1 DESIGN OF THE PROJECT

7.1.1 Need for the Proposed Modification

Section 1.3 presents a justification of the need for the Proposed Modification. In summary,

- the Proponent anticipates that up to approximately 2.96Mt of ore may be processed between 1 July 2019 and 31 December 2022;
- the approved Residue Storage Facility has a remaining capacity for approximately 1.02Mt of residue, a shortfall of approximately 1.94Mt;
- the Proposed Modification would provide additional storage for approximately 2.36Mt of residue.

In the absence of the Proposed Modification, or a similar modification to provide additional residue storage (see Section 7.1.2), mining operations would cease in mid-2020, 2 ½ years prior to the approved end of Mine life. This would result in the economic and other benefits described in **Table 4** ceasing earlier than they would otherwise cease.

7.1.2 Alternatives Considered

In preparing the Proposed Modification, the Proponent considered a range of alternatives. **Table 14** presents a brief overview of the alternatives considered and rejected by the Proponent, and the reasons why the alternative considered was rejected.

Table 14
Alternatives Considered

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Alternative Considered	Justification for Non-adoption of Alternative
Establishment of a new out-of-pit Residue Storage Facility	A new out-of-pit Residue Storage Facility would have required disturbance of additional land and substantial costs for the establishment of the initial foundation and lift for what is essentially a limited remaining mine life. Two areas of the Mine Site have been considered for potential additional out-of-pit Residue Storage Facilities as follows. • An area west of Gundong Creek – this site would, however, require residue and return water to be pumped considerable distance, including over Gundong Creek, increasing the risk of an uncontained discharge of residue to the creek. • An area south of the Caloma 2 Open Cut – this site would, however, includes gilgaied and sodic soils which could increase the geotechnical engineering requirements and risk of leakage / seepage. This site would also require pumping of tailings a considerable distance, again, increasing the risk of an uncontained discharge of residue.

Table 14 (Cont'd)
Alternatives Considered

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Alternative Considered	Justification for Non-adoption of Alternative
Establishment of a new in-pit Residue Storage Facility	An application for an in-pit Residue Storage Facility within the Wyoming 3 Open Cut was prepared in 2016. Substantial resources were devoted to the design of the facility and an application to modify PA09_0155 was prepared. A draft of the application was provided to the then Department of Planning and Environment and Environment Protection Authority and considerable consultation was undertaken with both agencies. The Environment Protection Authority maintained that the proposed in-pit Residue Storage Facility did not comply with its Tailings Storage Facility Liner Policy. After numerous discussions and attempts by the Proponent to resolve the Environment Protection Authority's concerns, in-pit residue placement was abandoned.
Not constructing additional residue storage	The Proponent considered not constructing the proposed Stage 7 to 9 lifts of the Tailings Storage Facility. This alternative would have resulted in the following. • An end to the approved operations approximately 2 1.2 years prior to the approved end of Mine life. • Loss of approximately 133 jobs and the associated approximately \$10.3 million per year in wages and salaries that those positions bring. • Loss of approximately \$ 12.8 million per year in economic activity associated with purchase of good and services. • Loss of approximately \$ 3.1 million per year in taxes, royalties, rates and other contributions to the Local, State and Federal governments. • Failure to extract State-owned resources, contrary to the objects of the <i>Mining Act 1992</i>. • Reduced returns to the Proponent's shareholders and reduced ability to fund ongoing exploration to identified replacement resources to continue the operation of the Mine beyond the approved end of Mine life.

7.2 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

7.2.1 The Precautionary Principle

In order to satisfy this principle of Ecologically Sustainable Development (ESD), emphasis must be placed on anticipation and prevention of environmental damage, rather than reacting to it.

Throughout the development of the Proposed Modification, the Proponent and GHD have adopted an anticipatory approach to impacts by undertaking an analysis of the risks posed by the Proposed Modification (see Appendix C of GHD (2019)) to guide the design of Stages 7 to 9. Examples of matters relating to the precautionary principle that were considered during the various stages of the Proposed Modification are listed below.

- The design of the Proposed Modification was prepared in accordance with the relevant guidelines, including all requirements of the Australian National Committee on Large Dams, the NSW Dam Safety Committee and currently accepted practice for Australian dam engineering.

- The performance of the existing Residue Storage Facility was reviewed by GHD (see Section 2.2.3) to ensure that it was not resulting adverse environmental impacts before determining to extend the life of the Facility.
- The design of the Proposed Modification was chosen to minimise disturbance to land not already the subject of prior disturbance. In particular, the Proponent has elected to steepen the southern face of the Residue Storage Facility through the use of higher strength material to remove the requirement to disturb vegetation to the south of the Facility.

As a result, the precautionary principle has been considered during all stages of the design and assessment of the Proposed Modification. The approach adopted provides a high degree of certainty that the Proposed Modification would not result in any major unforeseen impacts.

7.2.2 Social Equity

Social equity embraces value concepts of justice and fairness so that the basic needs of all sectors of society are met and there is a fair distribution of costs and benefits to the community. Social equity includes for both inter-generational (between generations) and intra-generational (within generations) equity considerations.

As demonstrated throughout Section 6, the Proposed Modification would have little effect on those impacts of the approved Mine. On this basis, it is not considered there would be any change to impacts on social equity of the Mine as a result of the Proposed Modification.

7.2.3 Conservation of Biological Diversity and Ecological Integrity

The protection of biodiversity and maintenance of ecological processes and systems are central goals of sustainability. It is important that developments do not threaten the integrity of the ecological system as a whole or the conservation of threatened species in the short- or long-term.

As identified in Section 2.2.3 and Section 4.5, the Proposed Modification does not require any additional disturbance to native vegetation or fauna habitat. Therefore, the Proposed Modification would not result in any reduction in biodiversity values or ecological integrity.

7.2.4 Improved Valuation and Pricing of Environmental Resources

The issues that form the basis of this principle relate to the acceptance that the polluter pays, all resources are appropriately valued, cost-effective environmental stewardship is adopted and the adoption of user pays prices based upon the full life cycle of the costs.

The value placed by the Proponent on environmental resources is evident in the considerable resources invested in designing and managing the existing and proposed Residue Storage Facility. On balance, it is assessed that the Proposed Modification provides for the continued recovery of gold, while not significantly increasing impacts on the environment.

7.3 STRATEGIC CONSIDERATIONS

The Proposed Modification is consistent with the Goals of the *Central West and Orana Regional Plan 2036* in that it would allow for:

- continued diversification of the local and regional economy, providing valuable non-agricultural income and economic activity in a time of very significant drought;
- the ongoing protection of agricultural lands;
- sustainable management of mineral resources; and
- the continued provision of education and training opportunities.

Similarly, the Proposed Modification is consistent with each of the Principles of the *Narromine Shire Community Strategic Plan 2027*, in particular, supporting vibrant local communities, growing the local economy and protecting the local environment.

7.4 STATUTORY CONSIDERATION

The Proposed Modification is made under Section 4.55(2) of the *Environmental Planning and Assessment Act 1979* and the Minister for Planning, or their delegate, or the Independent Planning Commission, is the consent authority. Sections 4.4 and 4.5 identify the preconditions to granting approval and the matters that must be considered by the Consent Authority prior to doing so. In summary, however, the Proposed Modification meets all preconditions to granting of development consent and this application addresses all matters to be considered by the Consent Authority.

7.5 COMMUNITY CONSIDERATIONS

The Proposed Modification would not adversely impact on the community. Indeed, the Proposed Modification would ensure the continued operation of the Mine until the currently approved end of life, with the resulting community benefits. In addition, as identified in Sections 3.2 and 5.2, the community have been provided with ample information in relation to the Mine, the Proposed Modification and associated activities and no concerns or issues have been raised.

7.6 BIOPHYSICAL CONSIDERATIONS

Potential biophysical impacts of the Proposed Modification have been assessed in Section 6. The following provides a brief overview of the residual biophysical impacts of the Proposed Modification.

- Noise – the Proposed Modification would not result in additional noise generating activities and, as a result, the Proposed Modification would not increase noise-related impacts surrounding the Mine Site. In addition, since the cessation of surface mining operations in January 2019, overall noise emissions from the Mine Site are substantially less than those approved.

- Surface water – the Proposed Modification would not result in changes to the approved water management system within the Mine Site, including the approved water balance or existing risk of discharge of contaminated water.
- Groundwater – the existing Residue Storage Facility is not resulting in adverse impacts to shallow groundwater in the immediate vicinity of the Residue Storage Facility and Proposed Modification is not expected to increase the risk of such an event occurring.
- Biodiversity – The Proposed Modification would not result in disturbance of any areas of native vegetation and would therefore not result in additional biodiversity-related impacts.
- Visual amenity - the proposed additional 6m height of the Residue Storage Facility is unlikely to be visible noticeable from publicly accessible vantage points surrounding the Mine Site.

All other environmental aspects are unlikely to be affected by the Proposed Modification.

7.7 SOCIO-ECONOMIC CONSIDERATIONS

The Proposed Modification would result in:

- continued employment of local residents;
- continued expenditure by Mine personnel in commercial facilities of Tomingley and other towns;
- continued contribution to the Narromine Shire and surrounding economies through payments for goods and services and contributions via taxes, royalties, rates and the VPA; and
- the indirect flow-on benefits associated with the afore-mentioned employment and economic contributions.

On the basis of the above and the fact that the Proposed Modification could be undertaken without affecting the amenity of surrounding residents it would have a positive influence on the socio-economic conditions of the village of Tomingley and surrounding region. As a result, it is considered that on balance the Proposed Modification would provide for a net socio-economic benefit.

7.8 THE PUBLIC INTEREST

In concluding this document, the Proponent contends that the Proposed Modification would be in the public interest for the following reasons. Each of the identified benefits identified would continue for a further 2 ½ years longer than would otherwise occur should additional residue storage not be available.

- Direct employment for approximately 133 people and payment of approximately \$6.3 million per year in wages and salaries.

- Injection of approximately \$12.8 million per year into the local and regional economy through the payment of wages and salaries and the purchase of goods and services.
- Payment of approximately \$3.1 million in taxes, royalties, rates and other contributions.
- Continued economic activity in a rural area in a time of significant drought and hardship for the surrounding community.
- Continued extraction of a State-owned resource in a manner that does not result in significant additional environmental impacts.

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