TOMINGLEY
GOLD OPERATIONS PTY LTD
(A wholly owned subsidiary of Alkane Resources Ltd)
ABN 53 149 040 371

Tomingley Gold Extension Project

Submissions Report

Major Project Application
SSD-9176045





Prepared by R.W. CORKERY & CO. PTY. LIMITED

May 2022

This page has intentionally been left blank

TOMINGLEY
GOLD OPERATIONS PTY LTD
(A wholly owned subsidiary of Alkane Resources Ltd)
ABN 53 149 040 371

Submissions Report

for the

Tomingley Gold Extension Project

Major Project Application No. SSD-9176045

Prepared for:

Tomingley Gold Operations Pty Ltd
ABN: 53 149 040 371
Tomingley West Road
TOMINGLEY NSW 2869
PO BOX 59
PEAK HILL NSW 2869

Telephone: (08) 9227 5677
Fax: (08) 9227 8178
Email: info@alkane.com.au

Prepared by:

R.W. Corkery & Co. Pty. Limited
Geological & Environmental Consultants
ABN: 31 002 033 712

Telephone: (02) 9985 8511
Email: admin@rwcorkery.com

Brooklyn Office:
Level 1, 12 Dangar Road
PO Box 239
BROOKLYN NSW 2083

Orange Office:
62 Hill Street
ORANGE NSW 2800

Brisbane Office:
Level 54, 111 Eagle Street
BRISBANE QLD 4000

Ref No. 616/49

May 2022

This Copyright is included for the protection of this document

CONTENTS

Page

CONTENTS

Page

APPENDICES

FIGURES

TABLES

ACRONYMS

AADT	annual average daily traffic
AIS	Agricultural Impact Assessment
AIP	Aquifer Interference Policy
AMC	AMC Consultants Pty Ltd
ANCOLD	Australian National Committee on Large Dams
AUL	auxiliary left
BAL	basic auxiliary left
BAM-C	Biodiversity Assessment Method Calculator
BCS	Biodiversity, Conservation and Science Directorate
BDAR	Biodiversity Development Assessment Report
BSAL	biophysical strategic agricultural land
CHR	channelised right turn treatment
DPE	Department of Planning and Environment
DPI	Department of Primary Industries
DP&I	Department of Planning and Infrastructure (now Department of Planning and Environment)
EIS	Environmental Impact Statement
EL	Exploration Licence
GHD	GHD Pty Ltd
HV	heavy vehicles
ICOLD	International Commission on Large Dams
ITA	Integrated Traffic Assessment
LSC	land and soil capability
LV	light vehicles
MAC	Muller Acoustic Consulting Pty Ltd
MLA	Mining Lease Application
NRAR	Natural Resources Access Regulator
PMF	probable maximum flooding
ROM	run-of-mine

RSF	residue storage facility
RWC	R. W. Corkery & Co. Pty Limited
SAR	San Antonio and Roswell
SMART	Specific, Measurable, Achievable, Realistic, Timebound Principles
SSD	State Significant Development
SSM	Sustainable Soils Management Pty Ltd
SWSD	SAR Water Storage Dam
TARP	Trigger Action Response Plan
TfNSW	Transport for New South Wales
TGEP	Tomingley Gold Extension Project
TGO	Tomingley Gold Operations
TMP	Traffic Management Plan

EXECUTIVE SUMMARY

Introduction

Tomingley Gold Operations Pty Limited (the Applicant) submitted an application for State Significant Development consent SSD-9176045 for the Tomingley Gold Extension Project (the Project). The application was accompanied by an *Environmental Impact Statement* (EIS) prepared by R. W. Corkery & Co. Pty Limited (RWC). The EIS and supporting technical assessments were exhibited from 28 February 2022 to 28 March 2022. During and following that period, the following submissions and advice was received by Department of Planning and Environment.

- Advice from 14 Government Agencies.
- Additional information from one organisation, namely the Siding Springs Observatory.
- Submissions from six members of the public, including five by way of support for the Project and one by way of objection.
- Submissions from three local councils, none of which objected to the Project.

Actions Taken Since Exhibition

Actions taken, and minor adjustments to the proposed activities, taken since the exhibition include the following.

- Additional land has been purchased by the Applicant and a number of minor errors in the land description have been addressed.
- The Roswell Mineral Resource has been updated. The updated Resource would not result in changes to the proposed mine sequence, mine schedule or the proposed maximum rate of processing.
- Minor changes to the design of the Project include the following. A separate *Amendment Report* has been prepared to describe and assess the proposed amendments.
  - Relocation of the proposed Roswell Ventilation Rise approximately 250m to the northeast of proposed location.
  - Relocation of proposed borrow pits from within the footprint of the SAR Open Cut North Pit to within the SAR Open Cut South and Central Pits.

Responses to Matters Raised in Submissions

A response has been provided to each of the Government Agency and the single public objection to the Project.

This page has intentionally been left blank

1. INTRODUCTION

1.1 SCOPE

Tomingley Gold Operations Pty Limited (the Applicant) submitted an application for State Significant Development consent SSD-9176045 for the Tomingley Gold Extension Project (the Project). The application was accompanied by an *Environmental Impact Statement* (EIS) prepared by R. W. Corkery & Co. Pty Limited (RWC). The EIS and supporting technical assessments were exhibited from 28 February 2022 to 28 March 2022. During and following that period, the following submissions and advice was received by Department of Planning and Environment.

- Advice from 14 Government Agencies.
- Additional information from one organisation, namely the Siding Springs Observatory.
- Submissions from six members of the public, including five by way of support for the Project and one by way of objection.
- Submissions from three local councils, none of which objected to the Project.

This *Submissions Report* provides an analysis of, and responses to each of the above submissions and advice, as well as an overview of the actions taken since the EIS was exhibited. The Report concludes with an updated evaluation of the Project's merits that reflect all additional matters arising from the review of submissions. A total of four appendices are provided as follows.

1. Submissions Register
2. Updated table of mitigation measures
3. Technical Response to Environment Protection Authority Submission
4. Revised Integrated Transport Assessment

An *Amendment Report* has been prepared describing and assessing the following proposed amendments.

- Relocation of the proposed Roswell Ventilation Rise approximately 250m to the northeast of proposed location.
- Relocation of proposed borrow pits from within the footprint of the SAR Open Cut North Pit to within the SAR Open Cut South and Central Pits.

No additional land would be disturbed as a result of the proposed amendments.

This Report has been prepared generally in accordance with the requirements of *State significant development guidelines – preparing a submissions report* dated November 2021.

1.2 PROJECT OVERVIEW

The Project would involve the extension of the existing Tomingley Gold Operations gold mine (the TGO Mine), located immediately to the south of the Tomingley village in central western NSW (the TGO Mine Site), to incorporate mining of the San Antonio and Roswell (SAR) deposits

through the development of the SAR Mine. The SAR Mine Site would be located immediately to the south of the TGO Mine Site (**Figure 1**). For the purposes of this document, the Project would comprise the following core components (**Figure 1**).

- The realignment the Newell Highway and Kyalite Road, including the intersections of the Newell Highway and Kyalite Road, McNivens Lane and Back Tomingley West Road.
- Surface and underground mining operations within the SAR Mine Site, including the delivery of waste rock and ore to the TGO Mine Site for stockpiling and/or processing.
- Continued operation of the TGO Mine as approved under development consent MP 09_0155, beyond the approved end of mine life on 31 December 2025, including construction and use of:
  - Stages 3 to 9 of Residue Storage Facility 2;
  - a grinding mill and associated modification to the crushing circuit within the TGO Processing Plant; and
  - use of the Caloma 1 and 2 Open Cuts for in-pit placement of waste rock.
- The connection of the existing "Dappo" bore to the Applicant's existing and approved water supply pipeline that runs from Narromine to the TGO Mine Site.

At the time of finalisation of this Report, two applications to modify MP 09_0155 were in progress as follows. See also Section 3.1.

- Modification 6 (MOD6) – for the construction and use of Stage 9, Cell 2 of Residue Storage Facility 1.
- MOD7 – for the construction and use of a northern ramp for the Wyoming 1 Open Cut.

1.3 KEY TERMS AND TERMINOLOGY

Throughout this document a range of terms and terminology have been used to describe key aspects of the Project, as follows.

The Project	All approved activities that are currently the subject of development consent MP 09_0155 within the TGO Mine Site and those additional activities that would be the subject of any new development consent to be granted, including those within the SAR Mine Site.
The Applicant	Tomingley Gold Operations Pty Ltd.
TGO Mine	The existing Tomingley Gold Operations undertaken in accordance with the requirements of MP 09_0155.
SAR deposits	San Antonio and Roswell deposits, the subject of the proposed mining operations.

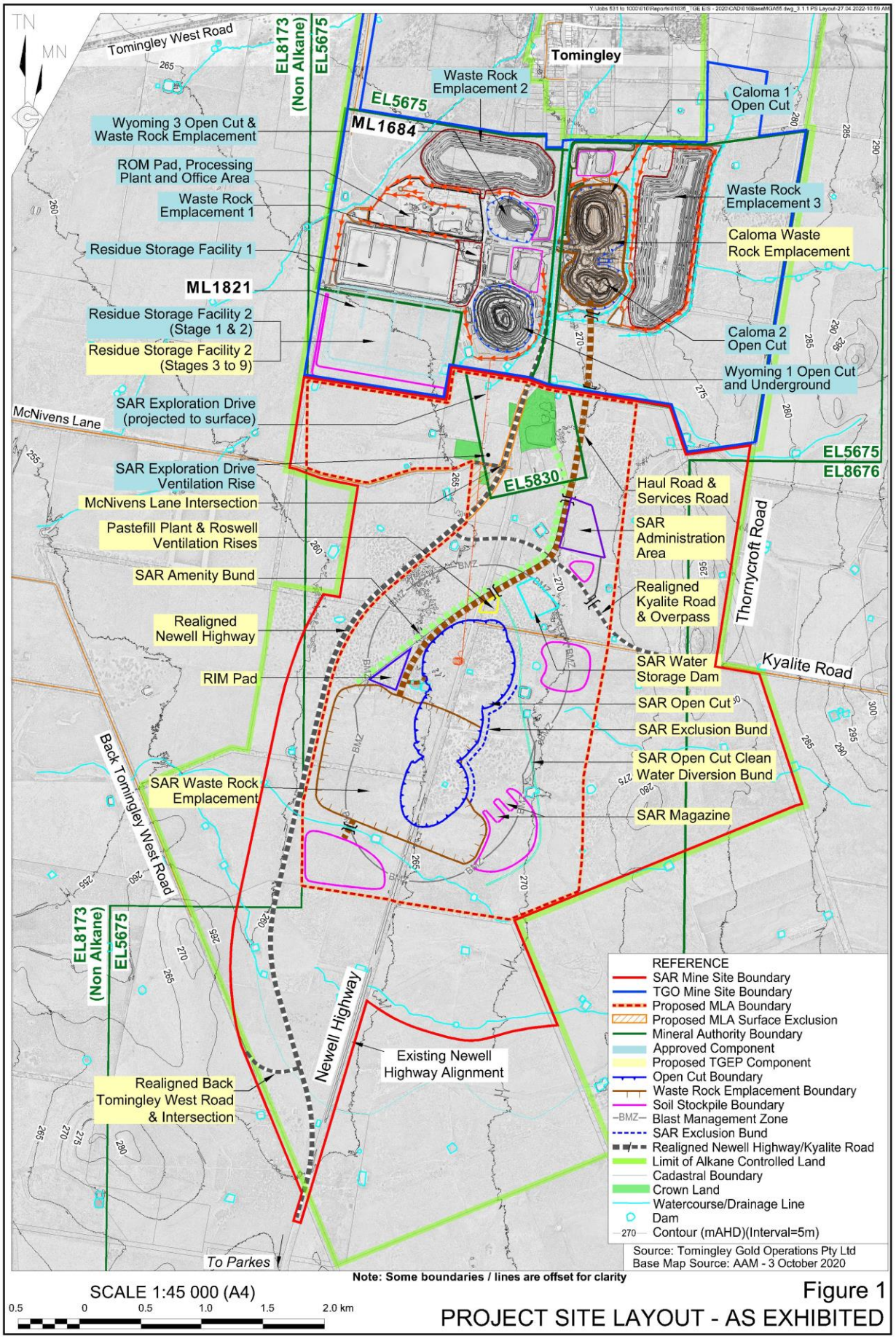


Figure 1
PROJECT SITE LAYOUT - AS EXHIBITED

SAR Mine	The proposed surface and underground mining operations that would mine the SAR deposits, including all relevant mining-related infrastructure and activities.
TGO Mine Site	Comprising the area the subject of MP 09_0155 and shown with a solid blue line on **Figure 2**.
SAR Mine Site	Comprising the additional area to be incorporated within any new development consent to be granted and shown with a solid red line on **Figure 2**.
Project Site	The combined area of the TGO Mine Site and SAR Mine Sites and the area to be the subject of any new development consent to be granted shown with a dashed black line on **Figure 2**.
MLA Area	That area the subject of the proposed Mining Lease Application and shown with a dashed red and orange line on **Figure 2**.
TGEP Application	Application for State Significant Development consent for the Project
MOD6 Application	Application to modify MP 09_0155 to permit construction and use of RSF1, Stage 9, Cell 2
MOD7 Application	Application to modify MP 09_0155 to permit construction and use of a northern ramp for the Wyoming 1 Open Cut.

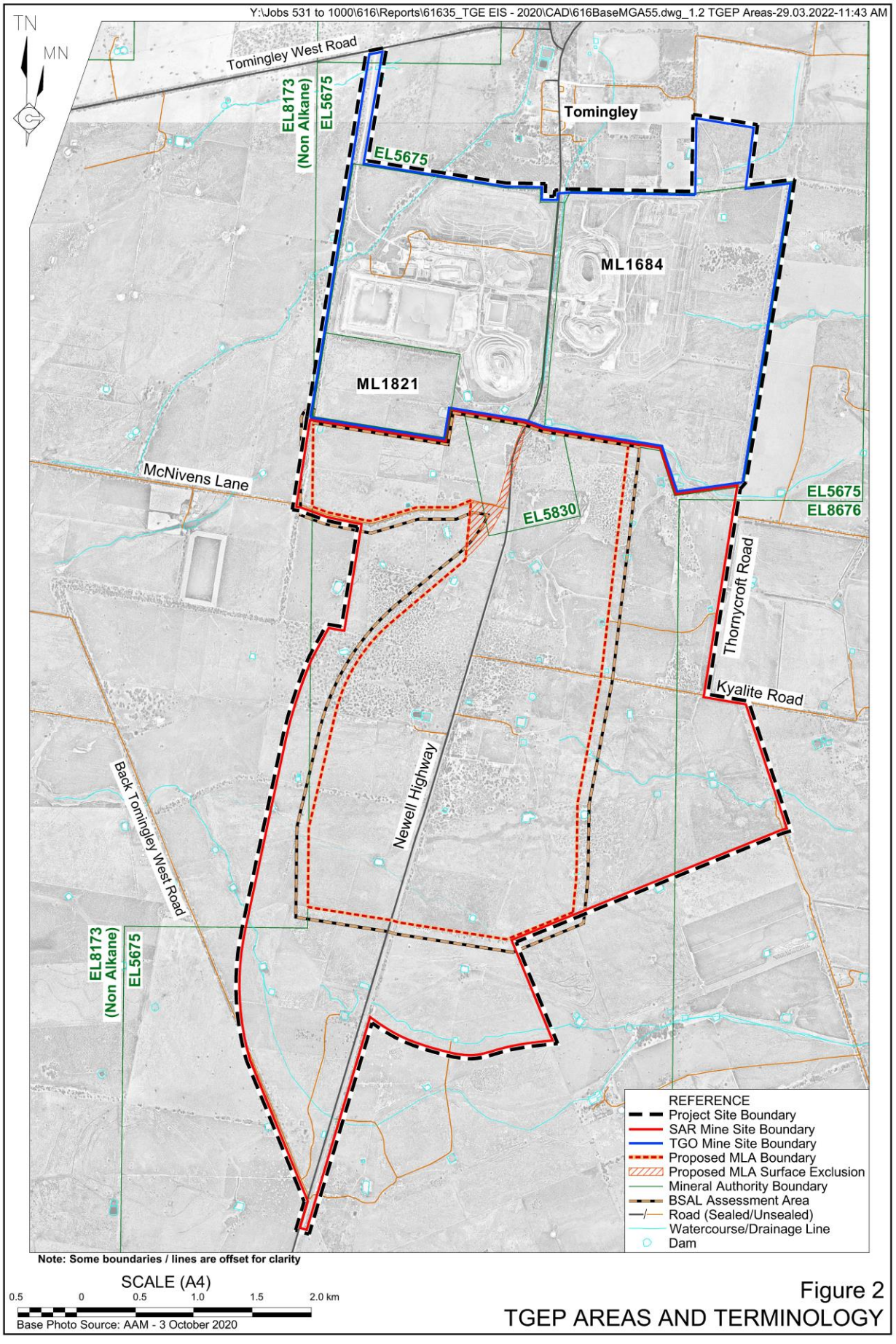


Figure 2
TGEP AREAS AND TERMINOLOGY

2. ANALYSIS OF SUBMISSIONS

2.1 BREAKDOWN OF SUBMISSIONS

The EIS and supporting technical assessments were exhibited from 28 February 2022 to 28 March 2022. During and following that period, the following submissions and advice was received by Department of Planning and Environment.

- Advice from 14 Government Agencies.
- Additional information from one organisation, namely the Siding Springs Observatory.
- Submissions from six members of the public, including five by way of support for the Project and one by way of objection.
- Submissions from three local councils, none of which objected to the Project.

Appendix 1 and **Table 1** present a breakdown of the public submissions by location and support/opposition of the Project. In summary, of the 6 public submissions, 5 were in support and 1 opposed. Public support was received from those living locally, regionally and elsewhere in the State. The single opposing submission was received from a local resident.

Table 1
Breakdown of Public Submissions

Location of Submitter[1]	Support	Oppose
Local (<10km)	1	1
Regional (10km to 100km)	2	0
State (>100km)	2	0
Total	**5**	**1**

2.2 CATEGORISING ISSUES

Figure 3 presents the frequency with which the listed matters were raised across all 24 submissions. Submissions are categorised as either 'Agency' (Government agencies, Councils and Siding Spring Observatory) or "Private' (private individuals or organisations). Due to the low number of submissions, topics are grouped into overarching environmental, planning, or other aspects.

For Agency submissions, the topics raised generally relate directly to the matters administered by the respective agencies. The topics most frequently identified were:

- Project Design, including but not limited to comments on the proposed realignment of the local road network and the proposed Residue Storage Facility 2;
- Licences, Approvals and Agreements, including general comments or requests for these to be attained by certain milestones; and
- Agriculture, Land and Soil, including but not limited to comments on the proposed long-term management of these resources within land owned by the Applicant.

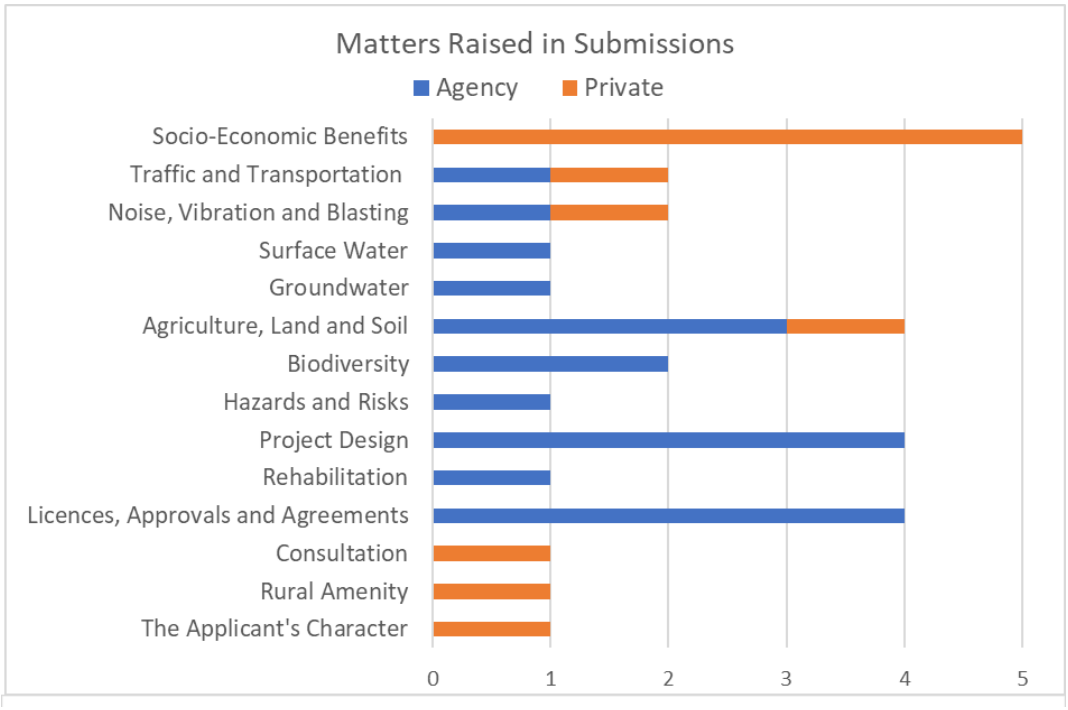


Figure 3
Breakdown of Submissions

For Private submissions, supporting submissions generally identified the social and economic benefits of the Project to the local, regional and State community, as well as recognising the value of the Applicant's existing operations. Topics raised by the single opposing submission covered a wide range of topics, generally relating to potential environmental impacts as well as the Applicant's history of consultation, complaints handling and the independence of ongoing monitoring programs.

3. ACTIONS TAKEN SINCE EXHIBITION

3.1 APPLICATIONS TO MODIFY MP 09_0155

3.1.1 Introduction

The TGO Mine currently operates in accordance with development consent MP 09_0155. In addition to the TGEP Application, the Applicant has two applications to modify MP 09_0155 in progress. **Figure 4** presents the areas within the TGO Mine Site the subject of each of these applications and the following subsections provide a brief overview of each. The MOD6 an MOD7 Applications will be assessed in parallel with the assessment for TGEP Application.

3.1.2 MOD6 – RSF1 Stage 9 Cell 2

MOD6 seeks consent for an increase in the capacity of the existing and approved RSF1. Public exhibition of the *Modification Report* for MOD6 was between 21 March 2022 and 13 April 2022.

MOD6 is required to ensure the adequate residue storage capacity and uninterrupted operation of the TGO Mine after Residue Storage Facility 1 Stage 9 Cell 1 is filled in late 2022 and before Residue Storage Facility 2 is commissioned in 2023.

The principal activities associated with MOD6 include the following.

- An increase in the capacity of Residue Storage Facility 1 from approximately 8.93 million tonnes (Mt) to approximately 9.33Mt.
- A 2m increase in the approved maximum elevation of Residue Storage Facility 1 Stage 9 Cell 2 from 284.5 m AHD to 286.5m AHD, consistent with the approved Stage 9 Cell 1.

Construction of RSF1 Stage 9 Cells 1 and 2 and RSF2 Stage 1 would be undertaken concurrently and would utilise a single construction fleet.

MOD6 would not result in any additional surface disturbance within the TGO Mine Site.

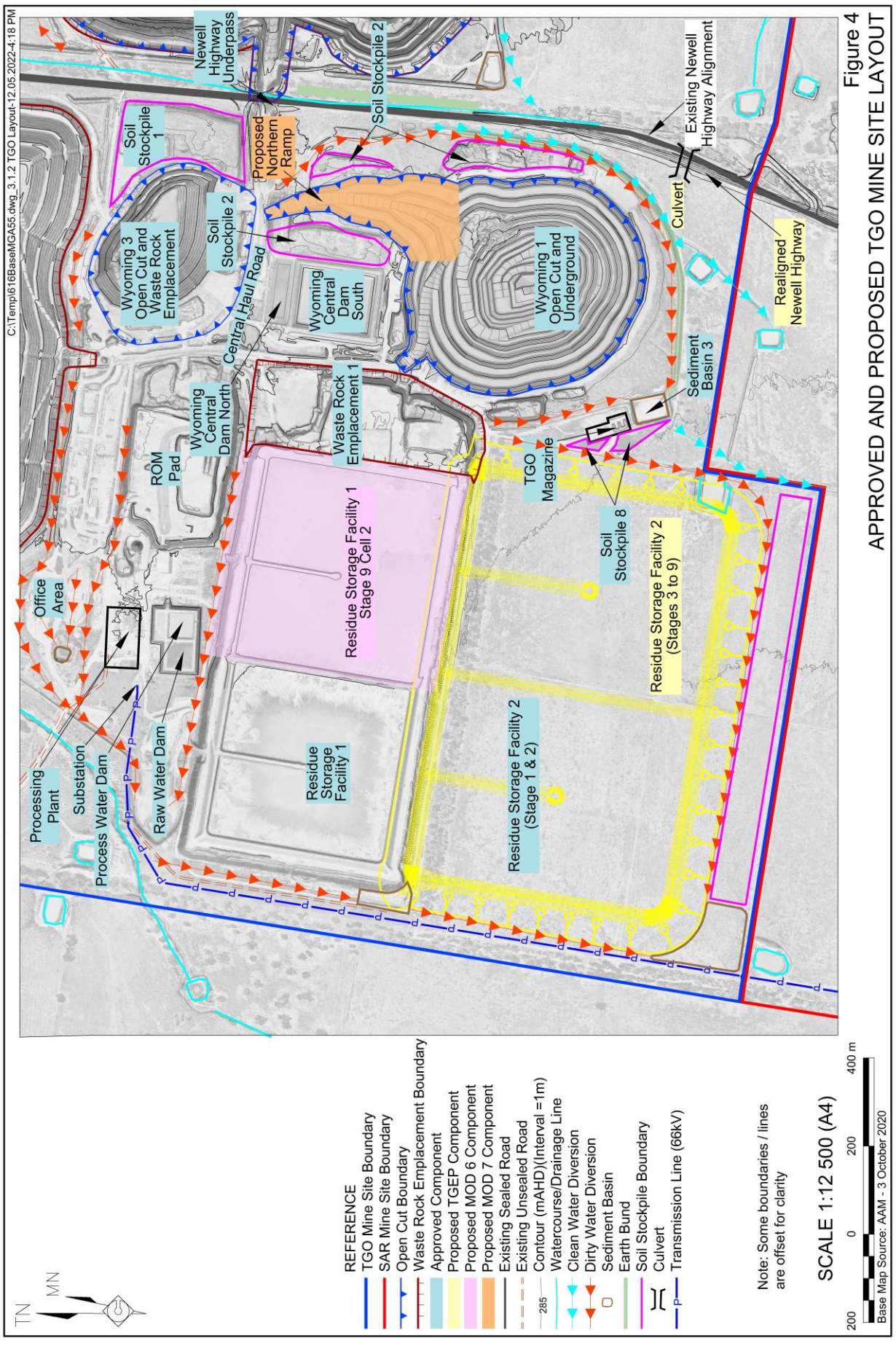
3.1.3 MOD7 – Wyoming 1 Open Cut Northern Ramp

The Applicant proposes to submit an application for a further modification to MP 09_0155. That modification, MOD7, would seek consent for the following.

- Construction and use of a Northern Ramp to permit long term safe access to the Wyoming 1 Open Cut.
- Minor amendments to the final landform to reflect the construction of the Northern Ramp.

A draft *Scoping Report* for MOD7 has been provided to the Department of Planning and Environment and a Scoping Meeting with the Department and the Resources Regulator was held on 9 May 2022.

The *Modification Report* for the MOD7 Application will fully assess the activities for which development consent is being sought, assuming the concurrent operation of the modified activities and all other approved and proposed activities.


C:\Temp\616BaseMGA55.dwg_3.1.2 TGO Layout-12.05.2022-4:18 PM
Newell Highway Underpass
Soil Stockpile 1
Soil Stockpile 2
Proposed Northern Ramp
Soil Stockpile 2
Existing Newell Highway Alignment
Culvert
Realigned Newell Highway
Wyoming 3 Open Cut and Waste Rock Emplacement
Central Haul Road
Wyoming Central Dam South
Wyoming 1 Open Cut and Underground
Sediment Basin 3
Wyoming Central Dam North
Waste Rock Emplacement 1
ROM Pad
TGO Magazine
Soil Stockpile 8
Residue Storage Facility 1 Stage 9 Cell 2
Residue Storage Facility 2 (Stages 3 to 9)
Office Area
Residue Storage Facility 1
Residue Storage Facility 2 (Stage 1 & 2)
Substation
Processing Plant
Process Water Dam
Raw Water Dam
APPROVED AND PROPOSED TGO MINE SITE LAYOUT
Figure 4
REFERENCE
TGO Mine Site Boundary
SAR Mine Site Boundary
Open Cut Boundary
Waste Rock Emplacement Boundary
Approved Component
Proposed TGEP Component
Proposed MOD 6 Component
Proposed MOD 7 Component
Existing Sealed Road
Existing Unsealed Road
Contour (mAHD)(Interval =1m)
Watercourse/Drainage Line
Clean Water Diversion
Dirty Water Diversion
Sediment Basin
Earth Bund
Soil Stockpile Boundary
Culvert
Transmission Line (66kV)
Note: Some boundaries / lines are offset for clarity
SCALE 1:12 500 (A4)
200 0 200 400 m
Base Map Source: AAM - 3 October 2020
TN
MN

MOD7 would not result in any additional surface disturbance within the TGO Mine Site.

3.2 PROPERTY OWNERSHIP

Since finalisation of the EIS, the Applicant has completed the purchase and transfer of ownership of three Crown Roads. That land is now identified as Lots 1 to 3 DP 1281392. **Table 2** and **Figure 5** present the updated land titles within the Project Site. Land titles added to the Project Site since exhibition are shown in **bold** text in **Table 2**. In addition, the following minor errors in the landownership figure presented in the EIS were identified following finalisation.

- Lots 1 and 2 DP 1157935 were not identified as being owned by the Applicant.
- Parts of the surrounding road network were not shown as "Road Reserve".

Figure 5 presents an updated version of the Land Ownership and Residences figure.

3.3 UPDATED MINERAL RESOURCE

Following the completion of the EIS, exploration activities within the SAR Mine Site have continued. The Applicant released an updated Mineral Resource for the Roswell Deposit on 2 May 2022.[1] **Table 3** presents an updated version of Table 1.1 from the EIS including the updated Roswell Mineral Resource.

The updated Mineral Resource would not result in changes to the proposed mine sequence, mine schedule or the proposed maximum rate of processing as presented in Sections 3.5.4 and 3.7.3 of the EIS. In addition, the updated Mineral Resource would not result in the quantity of residue produced exceeding the design capacity of the combined Residue Storage Facilities. Rather, the additional material would merely form a component of the "projected" ore assumed to be present at the time that the EIS was completed (see Figure 3.5.6 and Table 3.5.2 of the EIS). The Applicant anticipates that additional Mineral Resource updates will continue to be released as sufficient exploration data becomes available and that that ore would similarly be incorporated into the mine sequence and schedule as identified in the EIS.

3.4 AMENDMENTS TO THE PROJECT

Minor changes to the design of the Project since Exhibition have resulted in the need to amend the Applicant's development application (the "Amended Project"). As a result, an *Amendment Report* has been prepared to describe and assess the anticipated additional impacts associated with the following amendments to the Project as exhibited.

- Relocation of the proposed Roswell Ventilation Rise approximately 250m to the northeast of proposed location.
- Relocation of proposed borrow pits from within the footprint of the SAR Open Cut North Pit to within the SAR Open Cut South and Central Pits.

To avoid duplication, the proposed amendments are not addressed further in this document.

[1] https://investors.alkane.com.au/site/PDF/4b78886d-f06b-4632-9a5a-70edc5197f6a/RoswellMineralResourceup37

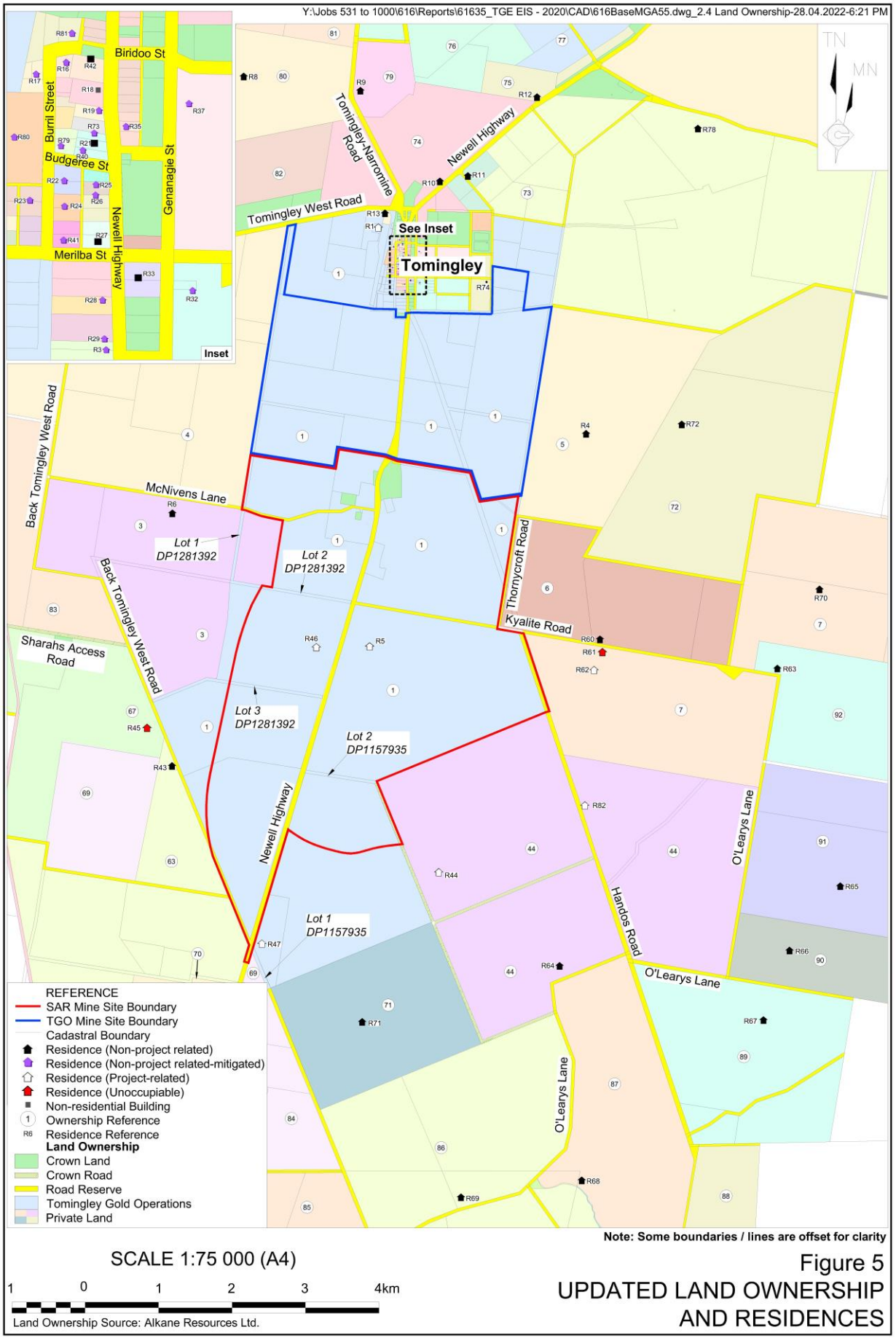

Y:\Jobs 531 to 1000\616\Reports\61635_TGE EIS - 2020\CAD\616BaseMGA55.dwg_2.4 Land Ownership-28.04.2022-6:21 PM
TN
MN
See Inset
Tomingley
Inset
Biridoo St
Burril Street
Budgeree St
Merilba St
Genanagie St
Newell Highway
Tomingley West Road
Tomingley-Narromine Road
Back Tomingley West Road
McNivens Lane
Lot 1 DP1281392
Lot 2 DP1281392
Lot 3 DP1281392
Lot 2 DP1157935
Lot 1 DP1157935
Thornycroft Road
Kyalite Road
Sharahs Access Road
O'Learys Lane
Handos Road
REFERENCE
SAR Mine Site Boundary
TGO Mine Site Boundary
Cadastral Boundary
Residence (Non-project related)
Residence (Non-project related-mitigated)
Residence (Project-related)
Residence (Unoccupiable)
Non-residential Building
Ownership Reference
Residence Reference
Land Ownership
Crown Land
Crown Road
Road Reserve
Tomingley Gold Operations
Private Land
Note: Some boundaries / lines are offset for clarity
SCALE 1:75 000 (A4)
1 0 1 2 3 4km
Land Ownership Source: Alkane Resources Ltd.
Figure 5
UPDATED LAND OWNERSHIP AND RESIDENCES

Table 2
Project Site Land Titles

Lot	DP	Lot	DP	Lot	DP
TGO Mine Site					
156	755093	2	1151198	122	755110
1623	1178801	161	755110	112	755110
1621	1178801	160	755110	95	755110
105	755110	162	755110	94	755110
104	755110	163	755110	111	755110
103	755110	1	1151198		
3	1151198	1	254193		
Road reserve associated with the Newell Highway.					
SAR Mine Site					
3	1213503	7003	1020605	2	254193
4	1213503	7300	1151814	43	755093
101	1271511	176	722842	1623	1178801
44	755093	157	755093	2	1157935
86	755093	175	755093	**2**	**1281392**
1	1273565	169	755093	**3**	**1281392**
127	755093	1	820746		
1622	1178801	122	755110		
Road reserves associated with the Newell Highway, McNivens Lane, Kyalite Road, Back Tomingley West Road.					
"Woodlands" and "Dappo" bores and pipelines					
"Woodlands" bore		18	755119	7002	1032703
"Dappo" bore		235	755131	1	1181773
Road reserves associated with the Mitchell Highway, Webbs Siding Road, Dappo, Wallaby, Bootles, Pinedean and Tomingley Roads.					

Table 3
Summary of Mineral Resources – April 2022

	Measured		Indicated		Inferred		Total		
Deposit	**Tonnage (Mt)**	**Grade (g/t Au)**	**Tonnage (Mt)**	**Grade (g/t Au)**	**Tonnage (Mt)**	**Grade (g/t Au)**	**Tonnage (Mt)**	**Grade (g/t Au)**	**Total Gold (koz)**
Tomingley Gold Operations									
Open cut[1]	1.517	1.7	2.373	1.4	0.777	1.1	4.667	1.5	222
Underground[1]	1.307	2.9	2.007	2.6	0.633	2.1	3.947	2.6	328
TGO Total	**2.824**	**2.3**	**4.380**	**1.7**	**1.410**	**1.8**	**8.614**	**2.0**	**550**
San Antonio and Roswell									
Roswell[2]	-	-	8.19	1.92	5.89	2.10	14.1	2.00	904
San Antonio[1]	-	-	5.93	1.82	1.39	1.32	7.3	1.73	406
SAR Total	**-**	**-**	**14.12**	**1.88**	**7.28**	**1.95**	**21.4**	**1.90**	**1 310**
Note: Apparent arithmetic inconsistencies are due to rounding									
Source 1: ASX announcement *Resource and Reserve Statements FY21* dated 7 September 2021									
Source 2: ASX announcement *Roswell Resource Contained Ounces Up 37% to 904,000oz* dated 2 May 2022									

4. RESPONSE TO SUBMISSIONS

4.1 INTRODUCTION

This section provides a response to the Government agency, Council and public submissions received. The following subsections provide representative comments from each submission in *italics* and response to the matter(s) raised.

4.2 GOVERNMENT AGENCY AND COUNCIL SUBMISSIONS

4.2.1 Agencies with No Further Requirements for Assessment

The following Government agencies and Councils responded with no formal comments or requirements for further assessment and, as a result, no response is required.

- Department of Primary Industries – Fisheries
- Dubbo Regional Council
- Heritage Council of NSW
- Heritage NSW
- Parkes Shire Council
- Siding Spring Observatory
- Subsidence Advisory

4.2.2 Biodiversity, Conservation and Science Directorate

BCS concurs with the calculation of the project biodiversity credits as presented in the Biodiversity Development Assessment Report (BDAR) and supporting Biodiversity Assessment Method Calculator (BAM-C) report. BCS recommends that the requirement to retire the 1724 ecosystem credits in accordance with s7.14(4) of the Biodiversity Conservation Act 2016 be included in the project consent conditions, should the project be approved.

Response

The Applicant has noted the above recommendation and would consent to a condition requiring the retirement of credits in accordance with the *Biodiversity Conservation Act 2016*.

The Applicant notes that potential options to retire the 1 724 include the following.

1. Purchase of ecosystem credits of the relevant class and type from a third party.
2. Establishment of an off-site Stewardship Site and retirement of the required ecosystem credits. There is no proposal to utilise an on-site Stewardship Site within or in the vicinity of the Project Site.
3. Payment into the Biodiversity Conservation Fund.

The Applicant has been waiting for the completion of the NSW Government's review of the current Biodiversity Offset Scheme. It is understood that that Review has yet to be completed or made publicly available. As a result, the Applicant has been unable to finalise its Biodiversity Offset Strategy because it is not clear how the Scheme will operate into the future, nor the most cost-effective and efficient manner in which to retire the required credits.

The Applicant in December 2021 determined the cost to retire all credits via payment into the Biodiversity Conservation Fund (Option 3) to be approximately A$10 million.

Similarly, the Applicant has entered into discussions with three other parties to retire ecosystem credits for PCT27 and PCT55 and PCT82, with the final costs for those credits awaiting completion of the above NSW Government review.

Finally, the Applicant has entered into discussions with two landholders in relation to purchase of land and/or establishment of one or more Stewardship Sites that would include adequate ecosystem credits for PCT27, PCT55, PCT82 and PCT201. Initial discussions have included in one case the costs of purchase of the land in question and in another assistance to set up a Stewardship Site. However, final agreements are pending completion of the above NSW Government review.

It is the Applicant's preference to utilise a combination of Options 1 and 3 above, namely, to purchase available credits from third parties and pay into the Biodiversity Conservation Fund for any credits which are not available for purchase on the market. If required, off-site Stewardships Sites (Option 2) will be established to retire the required credits. In light of the above, the Applicant is confident that adequate credits will be available to meet the Project's requirements.

In light of the fact that commercial negotiations in relation to purchase of credits and/or land cannot be completed until the NSW Government's review of the current Biodiversity Offset Scheme has been released, the Applicant respectfully requests adequate time to develop and implement a suitable Biodiversity Offset Strategy following completion of the NSW Government's review. Given the current schedule to commence construction operations in January 2023, this may require a condition of consent requiring that the relevant biodiversity credits be retired within an identified timeframe, consistent with the approach taken by Condition 34A of Schedule 3 of MP 09_0155. The Applicant would be pleased to work constructively with the Department to ensure that the objects of the *Biodiversity Conservation Act 2016* are adequately addressed while ensuring no unreasonable delay to the Project commencement.

Finally, the Applicant contends that it has previously demonstrated leading practice rehabilitation and biodiversity offsetting at its other mine sites within the Central West, namely Peak Hill Gold Mine, Dubbo Project and Tomingley Gold Operations.

BCS note that Tomingley Gold Operations currently manages an existing local offset site comprising at least five hectares of remnant PCT 201 as well as 26 hectares of "remnant extension (protection and ameliorative planting)" associated with the Tomingley Gold Project (Application Number: 09_0155). It is unclear whether the proposed project will impact on these areas.

Recommendations

1. *That the BDAR clarify any proposed impacts to planted Eucalyptus conica with reference to the NSW Scientific Committee determination for Fuzzy Box Woodland TEC.*

Response

BCS in its submission questioned whether the remnant "extension (protection and ameliorative planting)" would be disturbed and identified an "Area of Uncertainty" on Figure 1 of the submission where disturbance was presumed to occur. The areas of Fuzzy Box Woodland referenced by BCS are all located within the TGO Mine Site and are presented on Figure 6-5 of AREA (2021). None of these areas are within the SAR Mine Site and none would be disturbed by the Project.

In addition, and as described on Page 125 of AREA (2021), the Applicant planted approximately 800 Fuzzy Box seedlings within the SAR Mine Site. Figure 6-6 of AREA (2021) presents the location of those plantings. These seedlings are currently approximately 30cm high and have been guarded to prevent grazing by stock. The Applicant anticipates that less than 10 seedlings would be disturbed by proposed highway construction operations and any such seedlings that would be disturbed would be transplanted if practicable to do so. The Applicant will continue to plant and encourage natural regeneration of Fuzzy Box Woodland within the SAR Mine Site.

As a result, the Applicant contends that there is no requirement to update the BDAR with reference to the NSW Scientific Committee determination for Fuzzy Box Woodland TEC.

While the BDAR clearly demonstrates measures taken to avoid impacts to Fuzzy Box Woodland TEC and other native vegetation, additional information should be provided on the specific actions that will be taken on-site which will contribute towards the recovery of the TEC. As an example, this could include retaining functional components such as tree hollows, fallen logs, and the seed bank from the impacted area for re-use as part of on-site rehabilitation, remnant extension, and ameliorative planting.

BCS notes that the detail associated with such actions may form part of a broader post-consent management plan. However, summarising the actions proposed to contribute to the recovery of the TEC upfront will assist the consent authority when considering the serious and irreversible nature of impact resulting from the project.

Recommendations

2. *The BDAR be updated to include additional management actions proposed to contribute to the recovery of Fuzzy Box Woodland TEC.*

Response

In addition to the proposed measures to avoid, manage and mitigate all potential impacts to biodiversity values, including Fuzzy Box Woodland TEC, the Applicant would implement the following additional procedures. These additional measures are presented in **Appendix 2.**

- Salvage, where practicable, suitable habitat features (e.g., tree hollows, large woody material, etc) located within areas to be disturbed.
- Relocate all salvaged habitat features as soon as reasonably practicable to surrounding areas of increased biodiversity value that would not be impacted by the Project.
- Continue to source seed or other propagation material from local populations as far as practicable to maintain genetic integrity of the local plant populations.

- Engage and inform the local community on the importance of Fuzzy Box Woodland TEC as part of ongoing stakeholder engagement sessions, newsletters and/or other community engagement activities.

Recommendation

3. *The proponent should note when preparing a post consent management plan for the project that the requirements for all strategies of mitigation for residual and indirect impact should adhere to SMART (Specific, Measurable, Achievable, Realistic, Timebound) Principles, inclusive of triggers for remedial actions through adaptive management.*

Response

The Applicant has noted the above recommendation and would ensure all management strategies included in any relevant management plan adhere to SMART principles.

4.2.3 Crown Lands

---

1 *All Crown Land and Crown Roads within a Mining Lease (with surface rights), subject to mining or mining related activity, must be subject to a Compensation Agreement issued under Section 265 of the Mining Act 1992, to be agreed and executed prior to any mining activity taking place. The Compensation Agreement may include conditions requiring the Mining Lease Holder to purchase Crown land impacted on by mining activity.*

Response

The Applicant acknowledges the requirement to have a suitable Compensation Agreement in place prior to mining activities within Crown Land and Crown Roads taking place and will work with Crown Lands to negotiate such an agreement(s).

---

2 *All Crown Land and Crown Roads located within an Exploration Licence, subject to exploration activity, must be subject to an Access Arrangement issued under Section 141 of the Mining Act 1992, to be agreed and executed prior to any exploration activity taking place.*

Response

The Applicant acknowledges the requirement to have a suitable Compensation Agreement in place prior to exploration activities within Crown Land and Crown Roads taking place and will work with Crown Lands to negotiate such an agreement(s).

---

3 *All Crown Land and Crown Roads within a Mining Lease (with sub-surface rights only) must be subject to a Section 81 Consent under the Mining Act 1992 where surface activities are proposed, to be agreed and executed prior to any surface activity taking place.*

Response

The Applicant notes that no surface mining or mining related activities are proposed to be undertaken within the proposed MLA Area Surface Exclusion Area. Notwithstanding the above, the Applicant would seek to attain all required consents under Section 81 of the *Mining Act 1992* prior to any Project-related surface disturbance activities.

4 All Crown Roads within a Mining Lease or Exploration Licence must be subject to a works consent approval under s138 and or s71 of the Roads Act 1993 where exploration, mining or mining related activity impact on these roads.

Response

No Crown Roads are located within the proposed MLA Area. One Crown Road is located within the proposed SAR Mine Site and within EL5675 (see **Figure 5**). No surface mining, mining related activities or exploration has been undertaken or is proposed to be undertaken within the Crown Road.

Notwithstanding the above, where activities may be required that are not covered by existing approvals, the Applicant would seek to attain all relevant approvals for operations within Crown Roads in accordance with the *Roads Act 1993*.

4.2.4 Dams Safety NSW

The project proposes the construction of a water storage dam on the SAR site (the SAR Water Storage Dam (SWSD)). It is possible that the SWSD will be declared and TGO will need to contact DSNSW on info@damsafety.nsw.gov.au once the details of the dam are known and prior to construction commencing to confirm whether this is the case. If the dam is declared then a notification area will be established around the dam and mining within that notification area will be subject to monitoring conditions.

Response

The Applicant anticipates that proposed SAR Water Storage Dam would not be a declared dam because it would not:

- have a dam wall that would be more than 15m high; or
- cause a major or catastrophic level of severity of damage or loss or endanger the life of a person.

Notwithstanding this, the Applicant would consult with Dams Safety NSW during the final stages of design of Dam and if the Dam becomes a Declared Dam, the Applicant will consent to any reasonable condition regarding dam safety notification and monitoring.

4.2.5 DPE Water

4.2.5.1 Groundwater Model

Recommendation – Prior to Determination

The proponent should independently review the groundwater model to determine if it is robust, reliable and fit for purpose according to the requirements of the NSW Aquifer Interference Policy (AIP).

Response

The Applicant notes that it has raised the issue of a peer review of the groundwater model with multiple agencies over an extended period, including the following.

- Meeting with DPIE Water and Natural Resources Access Regulator on 26 August 2020. During that discussion it was identified that groundwater impacts were low risk, and that the groundwater assessment was required to be commensurate with that anticipated low risk. The Applicant requested confirmation in relation to the need or requirement for a peer review of the groundwater model and there is no record of a response on file.
- A draft of the groundwater assessment was included with the application for a Gateway Certificate. That application, including the groundwater model was assessed by the Commonwealth Independent Expert Scientific Committee. A meeting with members of the Gateway Panel, including the Panel's groundwater expert, was held on 7 October 2021. During that meeting, matters related to the groundwater model were discussed extensively, including the Applicant's justification for why a peer review was not required. The Gateway Certificate was subsequently issued on 15 November 2021.
- Advice was received from DPIE Water on 10 November 2021 providing a detailed assessment of the Gateway Application against the requirements of the Aquifer Interference Policy. That advice stated that the groundwater assessment had appropriately addressed each of the considerations identified by the Policy and provided approximately 2 pages of recommendations related to the groundwater model. Each of the recommendations were addressed in the final groundwater model presented with the EIS. The recommendations did not include a reference to completing an independent peer review.
- The Applicant again requested confirmation from DPIE – Water on 8 November 2021 whether a peer review of the groundwater model was required. A response was received on 10 November 2021 stating that further advice in relation to this matter would be provided. No record of a further response could be located.

In addition, the Applicant notes that the Aquifer Interference Policy states the following at Section 3.2.3.

> "A risk management approach to assessing the potential impacts of aquifer interference activities will be adopted, where the level of detail required to be provided by the proponent is proportional to a combination of the likelihood of impacts occurring on water sources, users and dependent ecosystems and the potential consequences of these impacts."

The risk assessment for the Project, presented as Appendix 3 of the EIS, classified all groundwater-related risks as "low risk", with the exception of "discharge of contaminated groundwater into the natural drainage" which was classified as Moderate Risk, primarily as a result of the risk of leakage from pipes transferring poor quality groundwater between surface storages.

Finally, the Applicant contends that groundwater-related risks associated with the Project are low to very low for the following reasons.

- The closest registered groundwater production bore to the SAR Mine Site is GW045137, a bore associated with the shallow alluvial aquifer adjacent to Gundong Creek, approximately 5.5km to the north of the SAR deposits (see Section 6.7.3.2 of the EIS). The closest production bores accessing the deeper fractured rock aquifer are a cluster of bores surrounding GW802842 located approximately 6.8km to the southeast of the SAR deposits.
- There are two aquifer systems surrounding the Project Site, including:
  - a shallow, perched alluvial aquifer associated with the larger drainages, particularly Gundong Creek; and
  - a deeper, fractured rock groundwater system (see Section 6.7.3.1 of the EIS).

  The Project would not intersect the shallow alluvial aquifer, with the deeper sections of the proposed Open Cuts and underground mining operations limited to the fractured rock aquifer.
- Standing water levels in bores within the SAR Mine Site are between 205m AHD and 207m AHD, or approximately 60m below the surface (see Sections 6.7.3.2 and 6.7.3.3 of the EIS). This is significantly lower than the elevation of surrounding major watercourses and, as a result, very limited potential exists for groundwater dependent ecosystems.
- Groundwater within the fractured rock aquifer is typically saline, ranging from 11 393µS/cm to 28 567µS/cm (see Section 6.7.3.3 of the EIS).
- Hydraulic conductivity of the fractured rock aquifer is very low (mean 2.1 x 10-^{3}m/d), indicating a "very tight" rock mass.

In addition, the Applicant has historically been unable to measure groundwater inflows to the open cuts and underground operations.

In light of the above, the Applicant contends that a peer review of the groundwater model is not required for the following reasons.

- A risk management approach has been taken throughout the groundwater assessment and model development and that groundwater risks associated with the Project are low to very low.
- The groundwater assessment and model has been reviewed throughout the application for the Gateway Certificate, including by DPIE-Water, who made a number of recommendations in relation to the groundwater model. Each of those recommendations have been actioned.
- Multiple requests were made for confirmation in relation to the need for a peer review of the groundwater model, with no response received.
- The Applicant has committed to undertake additional groundwater modelling based on updated groundwater monitoring data prior to 31 December 2024.

Notwithstanding the above, the Applicant will arrange for a peer review of the groundwater model to be completed. It is respectfully requested that the assessment of the application for development consent proceed in parallel with the proposed peer review.

Recommendation – Post Approval

The proponent should undertake a review of the groundwater model in year 2024 with observed data to revise the peak groundwater inflow into the pits, to ensure sufficient shares (entitlement) is held or additional shares purchased to account for any additional take.

Response

The Applicant would undertake a review of the groundwater model prior to 31 December 2024.

4.2.5.2 Water Take

Recommendation – Prior to Determination

Confirmation is requested as to the source of the water included in the "moisture in ore" water input in the water balance, and justification as to whether its removal needs to be accounted for by holding a water entitlement. Where a water entitlement is required the proponent needs to demonstrate this can be acquired.

Response

The Applicant has determined the "moisture in ore" percentage through direct measurement, by weighing selected samples of ore delivered to the ROM Pad, drying those samples in an oven and reweighing the sample once dried. The moisture content has averaged approximately 3% across a substantial number of samples over an extended period.

The Applicant acknowledges that water transported from the SAR Underground mine with ore, as well as water lost through ventilation and pumped directly from the mine will form a component of the water balance that would be used to verify the modelled groundwater inflows. If additional water entitlement is required, it would be purchased,

Recommendation – Post Approval

The proponent should:

- *Update the Water Management Plan to reflect additional modifications to the surface and groundwater systems, and include relevant water storage, take and transfer infrastructure. Monitoring, mitigation, and management measures should also be updated.*
- *develop a plan to measure/meter the groundwater inflow into the pits to confirm take predictions, and the adequacy of any mitigation measures and compliance for water take.*
- *develop a method to accurately meter and monitor water take from surface and groundwater sources with ongoing review of actual versus modelled predictions. This will be a key component to confirm impact predictions, the adequacy of mitigating measures and compliance for water take.*

- *report on water take at the site each year (direct and indirect) in the Annual Review. This is to include water take where a water licence is required and where an exemption applies. Where a water licence is required the water take needs to be reviewed against existing water licences.*
- *ensure sufficient water entitlement is held in a water access licence/s to account for the maximum predicted take for each water source prior to take occurring.*
- *ensure that relevant nomination of work dealing applications for Water Access Licences proposed to account for water take by the project have been completed prior to the water take occurring.*
- *be aware of the rules of the relevant water sharing plans.*

Response

The Applicant would ensure that those matters identified above would be included in a revised *Groundwater Management Plan*.

4.2.5.3 Surface Water

Recommendation – Post Approval

The proponent should:

- *include monitoring of geomorphic condition (along with the included water quality monitoring) of watercourse and riparian areas in their Operational Management and Mitigation Measures.*
- *include monitoring geomorphic condition including erosion and sedimentation at a range of locations upslope, within and downslope of the Project Site, including within Gundong and Bulldog Creeks, as well as in unnamed watercourses. Particular attention should be paid to the reaches downstream of the culvert outlets where flows will be concentrated and may extend for longer periods after higher flows or flooding.*
- *Specify triggers for remedial action in a detailed Trigger Action Response Plan (TARP) as part of any approval of the extension. Justification for design of the monitoring program and TARPs should include explanation of objectives, timing, frequency and duration of any monitoring program and how the TARPs response triggers will be followed and reported.*
- *Prepare performance reporting on channel form and any remedial actions to allow assessment and review of River Style condition and future geomorphic recovery. Any remedial actions or stream rehabilitation should be guided by the Rehabilitation Manual for Australian Streams (Rutherford et al. 2000).*

Response

The Applicant would ensure that those matters identified above were within a revised *Surface Water Management Plan*.

4.2.5.4 Other Post Approval Recommendations

The proponent should:

- *Develop a water management plan including the construction & placement of new monitoring bores, frequency of monitoring, water quality analyte suites and trigger action response plan. Performance against this plan should be reported annually.*
- *develop a strategy for accounting for any water taken beyond the life of the operation of the project, such as continuing to hold the appropriate amount in licence shares (entitlement) to cover any on-going indirect take or surrendering an access licence with appropriate shares in the LFB MDB* [Lachlan Fold Belt Murray Darling Basin] *Groundwater Source at the completion of the project.*
- *ensure watercourse crossings and other works within waterfront land are in accordance with the Guidelines for Controlled Activities on Waterfront Land (NRAR 2018). A vegetated buffer width consistent with the requirements of NRAR (2018) for a second order watercourse needs to be applied to Drainage Line F located to the south of the SAR deposit.*

Response

The Applicant would ensure that those matters identified above are included within a revised *Surface Water Management Plan*. Drainage Line F is a first order watercourse with no defined channel (see Plates 6.6.5 and 6.6.6 of the EIS) therefore no specific riparian vegetation management is necessary in this location.

4.2.6 DPI Agriculture

It is noted that as well as a soils assessment, a BSAL site verification has been completed. The findings of this assessment include 385ha of BSAL being verified despite no mapped BSAL being present on the site. To inform the remediation plan it is recommended that the following additional information could be included:

- *A comparison of the BSAL location to the LSC mapping*
- *Confirmation as to the amount of BSAL noting the AIS the summary on Page 7 includes that "373 ha or 38% of the BSAL Assessment Area satisfies the BSAL criteria." does not match the conclusion statement on Page 41 "The final BSAL map shows that the BSAL Assessment Area had 385 ha of BSAL…".*
- *Clarify the amount of verified BSAL which is to be disturbed and rehabilitated. Information to understand the baseline productivity, soil profile and characteristics of the verified BSAL, and a program of rehabilitation and monitoring to ensure this land is restored to a similar state.*

Response

The Applicant engaged Sustainable Soils Management Pty Ltd (SSM) to prepare the following assessments.

- *Land and Soil Capability Assessment*, referred to hereafter as SSM (2021a) and presented as Part 7a of the Specialist Consultant Studies Compendium.

- *Biophysical Strategic Agricultural Land Assessment*, referred to hereafter as SSM (2021b) and presented as Part 7a of the Specialist Consultant Studies Compendium.

Figures 6.8.2 and 6.8.3 of the EIS present the distribution of Soil Mapping Units and Land and Soil Capability respectively within the SAR Mine Site. Section 6.8.2.5 of the EIS provides a description of each Soil Mapping Unit, including its BSAL and the Land and Soil classification. These figures and section present the required comparison of the BSAL location to the LSC mapping.

The Applicant acknowledges that the BSAL area presented on Page 7 of SSM (2021b) is incorrect and confirms that the correct value for the total area of BSAL within the BSAL Assessment Area is approximately 385ha or approximately 39% of the total BSAL Area.

Section 6.8.2.5 of the EIS presents a description of the six principal Soil Mapping Units of the SAR Mine Site. For each Soil Mapping Unit, the BSAL classification and Land and Soil Capability Class is presented. In summary, all Chromosol and Andesite Chromosol within the SAR Mine Site is considered to be BSAL. Table 6.8.1 of the EIS presents the area of each Soil Mapping Unit to be disturbed. In summary, 189ha of Chromosol and 28ha of Andesite Chromosol would be disturbed for a total of 217ha of BSAL to be disturbed.

A detailed description of soil morphology for each of the six principal Soil Mapping Units, including Chromosol and Andesite Chromosol, is presented in Section 4.2 of SSM (2021a) and is summarised in Section 2.1.3.3 of the *Agriculture Impact Statement* (TGO, 2021) and Section 6.8.2.5 of the EIS.

Finally, Section 3.14.6 of the EIS presents rehabilitation objectives for the Project, including the following.

> "Ensure that areas to be retained for agricultural use achieve the nominated agricultural land capability and that the agricultural productivity of this land managed by the Applicant is higher at the end of mining operations than at the start."

In addition, Section 3.14.9 of the EIS identifies the rehabilitation monitoring that would be undertaken, including the following.

> "Agricultural productivity of rehabilitated lands, including measuring key metrics against selected analogue sites."

The rehabilitation Management Plan to be prepared following determination of the application for development consent would include additional details in relation to rehabilitation completion criteria and monitoring of rehabilitated lands, including BSAL soils and agricultural lands.

While monitoring of agricultural productivity will be measured "seasonally", there is no mention if a rehabilitation plan will be developed in consultation with relevant stakeholders to minimise the loss of agricultural land and agricultural productivity, only that expert opinion would be sought and implemented. The AIS technical notes (NSW DPI, 2013) state that "Monitoring should also include monitoring of consultation and issue groups. The concerns of these groups should be addressed in a timely fashion." (p11)

This review recommends that a revised assessment should include a commitment to consult with, and address the concerns of, consultation and issue groups, as outlined in the AIS technical notes (NSW DPI, 2013).

Response

The potential loss of agricultural land has been a key concern of the Applicant throughout the Project planning and assessment process. Community consultation undertaken by the Applicant during the preparation of the EIS identified that potential impacts to agricultural land within and surrounding the Project Site was also a concern of some members of the surrounding community. The Applicant recognises the potential impact of the Project on the long-term economic viability of the local area and considers responsible and sustainable management of agricultural operations within Applicant controlled lands to be paramount to their social licence to operate within the community.

Section 5.4 of the *Agricultural Impact Assessment* states that a *Rehabilitation Management Plan* describing the proposed rehabilitation operations and providing detailed completion criteria would be prepared in accordance with the relevant guidelines. That document would ensure that the agricultural and rehabilitation monitoring program would be in accordance with the following guidelines.

- *Strategic Regional Land Use Policy Guideline for Agricultural Impact Statements*, (DP&I, 2012).
- *Agricultural Impact Statement technical notes: A companion to the Agricultural Impact Statement guideline* (DPI, 2013).

4.2.7 Environment Protection Authority

The NSW Environment Protection Authority's submission raised a range of technical matters. The submission is presented in full in **Appendix 3.** A technical response has been prepared by Rod Linnet of Muller Acoustic Consulting Pty Ltd (MAC). MAC are the authors of the *Noise and Blasting Impact Assessment* for the Project, presented as Part 3 of the *Specialist Consultant Studies Compendium.*

4.2.8 Mining, Exploration and Geoscience

The Proponent must obtain the appropriate mining title(s), such as a mining lease, from MEG allowing for mineral extraction (Antimony, Arsenic, Bismuth, Copper, Gold, Lead, Silver, Zinc) under the Mining Act 1992 over the project extension area. MEG advises that all minerals that could be included in any future extraction and recovery should be included within the development consent application.

Response

Section 3.1.2 of the EIS outlines the approvals that would be required for the Project, including a Mining Lease under the *Mining Act 1992*. The Applicant acknowledges the requirement to obtain a suitable Mining Lease prior to the commencement of mining operations within the SAR Mine Site.

MEG requests that the Proponent consider potential resource sterilisation should any future biodiversity offset areas be considered. The Proponent must consult with MEG and any holders of existing mining or exploration authorities that could be potentially affected by the proposed creation of any such biodiversity offsets, prior to creation occurring.

Response

As identified in Section 4.2.2, the Applicant has yet to finalise its Biodiversity Offset Strategy pending completion of the NSW Government's review of the Biodiversity Offset Scheme. Notwithstanding this, the Applicant would consider potentially mineralised resources that may be present in the location of any potential Stewardship Sites and would consult with the MEG and the holder of any mineral authority affected by a proposed Stewardship Site.

4.2.9 Narromine Shire Council

4.2.9.1 Realigned Public Roads

Council requests appropriate conditions to ensure an approval for a consent under section 138 of the Roads Act 1993 will be required as an approval condition.

Response

Section 3.1.2 of the EIS outlines the approvals that would be required for the Project, including a consent under section 138 of the *Roads Act 1993* from Narromine Shire Council. The Applicant would consent to the condition requiring a Section 138 approval under the *Roads Act 1993*.

4.2.9.2 Wastewater Treatment

Reference is made to the proposed SAR administration area. The following approvals under the Local Government Act, 1993 may be required:

- *Installation of a pre-manufactured structure.*
- *Carryout installation of an onsite effluent disposal system.*
- *Carry out sewerage work.*
- *Carry out water plumbing work.*
- *Carry out stormwater work.*

Council is assuming an approval for a consent would be conditioned to be sought pursuant to s68 of the Local Government Act 1993, prior to the commencement of works.

Compliance would need to be demonstrated to the satisfaction of Council, pertaining to any conditions of the approvals pursuant to section 68 of the Local Government Act 1993 for works to carryout installation of any onsite effluent disposal system, water supply, stormwater and sewerage works & premanufactured structures.

Council will require all plumbing and drainage works be carried out by a licensed plumber and drainer to the requirements of the National Plumbing and Drainage Code and AS3500.

Response

The Applicant acknowledges that a range of additional approvals under Section 68 of the *Local Government Act 1993* would be required prior to the commencement of construction and/or occupation of the SAR Administration Area. All wastewater treatment works would be undertaken by suitably licences persons and in accordance with all relevant codes and standards.

4.2.9.3 Planning Agreement

The EIS notes that, a Planning Agreement with Narromine Shire Council is required in order to proceed. Also, that the Applicant has commenced a process to negotiate with Council to extend the existing TGO Planning Agreement to cover the Project.

Council would clarify that this process would not be treated as an extension to an existing agreement, rather a new agreement; and has been initiated (with a written request to enter a process and initial meeting). Due to the stage of negotiations, it is assumed that it would be a condition of consent that this process be completed. The consent authority is required to take into consideration any public submissions made in respect of the development application, which may include submissions relating to a planning agreement. In the regard it is noted the negotiations have not progressed so far as to have carried out any exhibition of a draft agreement.

Items noted in the EIS to be included in the planning agreement negotiations:

1. *A clause providing for the maintenance of Kyalite Road between the Newell Highway and the SAR Site Access Road at the Applicant's cost for the duration of the Project.*
2. *The Applicant would retain or remove the Kyalite Road overpass at the end of the life of the Project at the direction of Narromine Shire Council.*
3. *The proposed extensions and/or changes to the existing community funding currently would be in consultation with the Narromine Shire Council.*
4. *Planning Agreement with Narromine Shire Council provides for maintenance of the intersection Tomingley Road and Tomingley West Road.*
5. *Extend the existing Planning Agreement with Narromine Shire Council for the life of the Project.*

Response

The Applicant confirms the information provided by Narromine Shire Council regarding the status of the negotiations for a new Planning Agreement is accurate. The Applicant has agreed with Council the general terms of a new Planning Agreement, with negotiations in respect to the proposed rate for each item ongoing.

4.2.10 Resources Regulator

The following responses have been prepared by the Applicant in consultation with GHD Pty Ltd (GHD). GHD are the lead engineering consultants involved in the ongoing design of the Residue Storage Facility 1 and Residue Storage Facility 2. The combined Residue Storage Facility 1 and 2 is hereafter referred to as the “Facility”.

4.2.10.1 Rehabilitation Objectives

Clarification of rehabilitation objectives is required to address the following:

- *Tailings/rejects storage facility long term stability (hydrology/surface drainage) performance - including a commitment to meeting requirements for closure specified in industry-accepted guidelines such as ANCOLD* [Australian National Committee on Large Dams] *and the Global Industry Standard on Tailings Management.*

Response

The following rehabilitation objectives regarding the capping and closure of the Facility have been developed by GHD in consideration of Australian National Committee on Large Dams (ANCOLD) and International Commission on Large Dams (ICOLD) guidelines. These objectives would be incorporated into the *Rehabilitation Management Plan* to be prepared following receipt of development consent for the Project.

- Ensure the long-term stabilisation of physical and chemical conditions of the Facility.
- Ensure that the final land use of the Facility requires ongoing maintenance and expenditure that is no greater that that normally required for similar land use.
- Ensure that the final landform and land use of the Facility does not pose a risk to human health and safety or an unacceptable environmental risk.
- Ensure that the Facility's final land and water use meets stakeholder and community objectives.

The key design criteria for the closure of the Facility that would be adopted during detailed design would be as follows:

- Design Flood Loading: Probable Maximum Flood (PMF) accounting for predictive climate change modelling.
- Design Earthquake Loading: Maximum Credible Earthquake 1:10 000 Annual Exceedance Probability equal to a minimum Peak Ground Acceleration of 0.180g.

It should be noted that both the design flood loading and the design earthquake loading have been determined based on maximising the safety of the Facility to either meet or exceed the minimum design loading requirements set out in both ANCOLD and the *Global Industry Standard on Tailings Management*.

Based on the above criteria the spillway and drop structures will be constructed using a range of materials including coarse rock where appropriate or reinforced concrete. Downstream of the control structures non-erodible non-acid forming waste rock would be utilised to protect against erosion. In addition to this, the spillways would be designed to spread the flow from the Probable Maximum Precipitation rainfall event minimising flow depths and velocities.

Clarification of rehabilitation objectives is required to address the following:

- *Clarification on the objectives for the capping to be placed over the tailings storage facilities - specifically the type of agricultural activities that the final land use will support in this area, including vegetation types and inevitable tree growth.*

Response

Information on the specific design of the anticipated capping of the Facility is presented in Section 14.2.2 of GHD (2022) presented as Appendix 13 of the EIS. In summary, GHD (2022) propose reprofiling of the residue and establishment of a basal layer of general fill, overlain by 0.5m of impermeable clay layer and a 1m think soil/rock mulch. The rehabilitated landform would be revegetated with locally occurring grass species.

The proposed final land use domain for the Facility is shown indicatively on Figure 3.14.4 of the EIS as Agriculture/Industrial Use. As identified in Section A4.5.3.1 of Appendix 4 of the EIS, the Applicant's preferred land use for the Facility is an "industrial," non-vegetated use. However, as the Facility is currently Zoned RU1 – Primary Production under the *Narromine Local Environment Plan 2011*, the default final land use for the Facility would be "agriculture."

In the absence of a development consent for an alternative use, the most appropriate final land use for the Facility would be a grassland that would be managed through light grazing to assist in the control of vegetation growth.

In light of the above, the following objectives for the rehabilitation of the Facility would be implemented. These objectives would be incorporated into the *Rehabilitation Management Plan* to be prepared following receipt of development consent for the Project.

- Establish a mixed pastural species groundcover commensurate with the existing rehabilitation of the Waste Rock Emplacements within the TGO Mine Site.
- Provide a landform that enables ongoing and long-term management of the vegetation of the Facility, including for light grazing and vehicle access where practicable.

Pastural grass species would be established as the dominant groundcover based on the following.

- Pastural grasses would allow for ongoing vegetation management through light and intermittent grazing.
- Pastural grasses have root systems that would be unlikely to result in damage to the embankments and/or capping layer.

Tree growth would be managed through intermittent grazing and ongoing land management and the Applicant contends that tree growth is not "inevitable." In addition, the structural and chemical composition of the Facility is not considered to be conducive to the establishment of large or mature woody vegetation that would have the potential to damage the underlying structure of the capping layers. The rock mulch proposed to be used as a growth medium would provide a reduced void size and water holding capacity compared to the surrounding area to which local species are largely adapted to. In the event that large vegetation does manage to infiltrate the capping surface and reach the tailings material, the chemistry of the tailings is considered to be hostile to the growth of vegetation and therefore further infiltration to the tailings would not be expected to occur.

Clarification of rehabilitation objectives is required to address the following:

- *Clarification of the land capability objective for all domains that have an agricultural land use specified*

Response

Table 4 presents the Land and Soil Capability (LSC) Class objectives for all agricultural final land use domains within the TGO Mine Site. Information for the post-mining LSC Class for the SAR Mine Site is presented in Section 6.8.6.2 and Figure 6.8.4 of the EIS.

Table 4
Agricultural Land and Soil Capability Class Objectives

TGO Final Land Use Domain[1]		LSC Class Objective	Definition[2]
1. Agriculture – Cropping and Grazing	East of the Newell Highway	Class 4	**Moderate capability land**: Land has moderate to high limitations for high-impact land uses. Will restrict land management options for regular high-impact land uses such as cropping, high-intensity grazing and horticulture. These limitations can only be managed by specialised management practices with a high level of knowledge, expertise, inputs, investment and technology.
	West of the Newell Highway	Class 6	**Low capability land**: Land has very high limitations for high-impact land uses. Land use restricted to low-impact land uses such as grazing, forestry and nature conservation. Careful management of limitations is required to prevent severe land and environmental degradation.
2. Agriculture – Low Intensity Grazing			
3. Agriculture or Industrial			

Note 1: See Figure 3.14.4 of the EIS

Note 2: Source – Table 2 of *The Land and Soil Capability Assessment Scheme: Second Approximation* (Office of Environment and Heritage, 2012).

Clarification of rehabilitation objectives is required to address the following:

- *Clarification of the stability that will be achieved in the void final profile - refer to comments below regarding final void slope stability.*

Response

See Section 4.2.10.3.

4.2.10.2 Progressive Rehabilitation

Information on progressive rehabilitation is required to show a schedule of rehabilitation activities/areas mapped against key production milestones (i.e. ROM tonnes) of the mine layout sequence before being translated to indicative timeframes for each stage of rehabilitation throughout the mine life.

Response

The Applicant contends that sufficient information on the anticipated progressive rehabilitation of the Project Site is presented in the EIS. It is noted that specific information on rehabilitation scheduling is a key part of the proposed *Rehabilitation Management Plan* that the Applicant would prepare. As the Project is still in the planning and assessment stage, detailed and specific rehabilitation scheduling is not considered to be a reasonable requirement at this stage of the Project, particularly as the proposed mine schedule and key production milestones are at an early stage of development.

4.2.10.3 Final Landform Design

Conceptual Final Landform Design

Further information is required to show significant water management features on these plans, such as the proposed engineered drop structure (or spillway) for the tailings storage facility. Sectional views through key remnant features, such as final voids are also required.

Response

The Applicant contends that the final design of the proposed spillways is not a reasonable requirement at this stage of the Project as the detailed designs are currently in development. Information on the design of the proposed emergency spillways to be constructed as part of RSF2 is provided in Section 7.5 of GHD (2022) presented as Appendix 13 of the EIS.

Figures 6 and **7** present cross sections of the proposed final landforms of the TGO Mine Site and SAR Mine Site respectively. The locations of the cross sections shown on **Figure 6** are the same as those presented in the existing and approved *Mining Operations Plan* for the TGO Mine Site.

Final landform design of rehabilitation

Its the Regulator's expectation that geomorphic design principles and use of Landform Evolution Modelling will be revisited throughout the mine life to address long-term erosion and stability risks.

Response

The Applicant notes the Regulators expectation.

Final Void Constraints and Opportunities Analysis

Information is required on a constraints and opportunities analysis of final void options, including backfilling, to justify that the proposed design is the most feasible and environmentally sustainable option to minimise the sterilisation of land post-mining. This analysis needs to take into account the identified instability issues associated with the Wyoming One pit.

Response

The Applicant notes that the current approved final landform for the TGO Mine Site includes the following.

- One fully backfilled open cut, namely the Wyoming 3 Open Cut.
- Three final voids, namely the Wyoming 1, Caloma 1 and Caloma 2 Open Cuts.

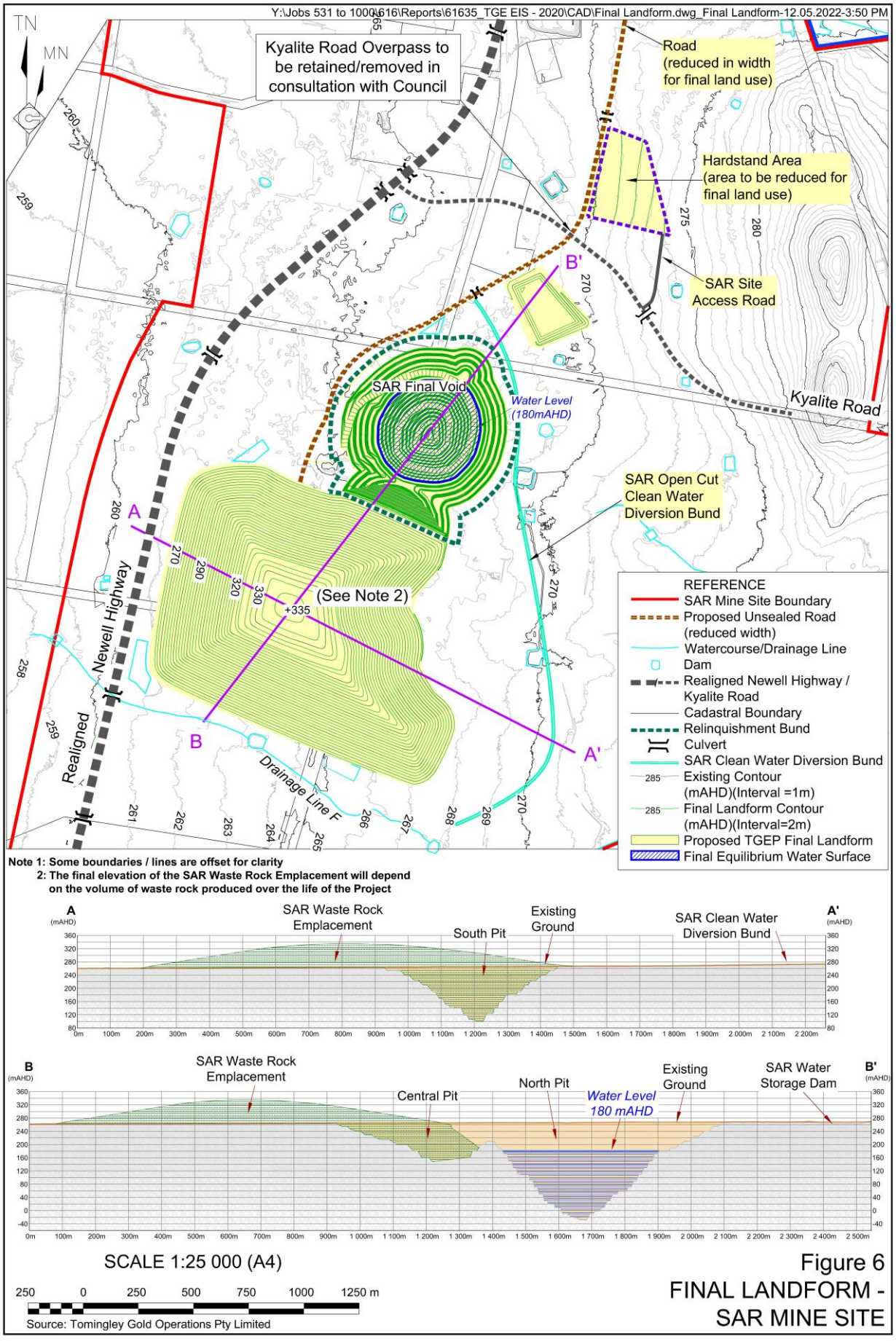


Figure 6
FINAL LANDFORM - SAR MINE SITE

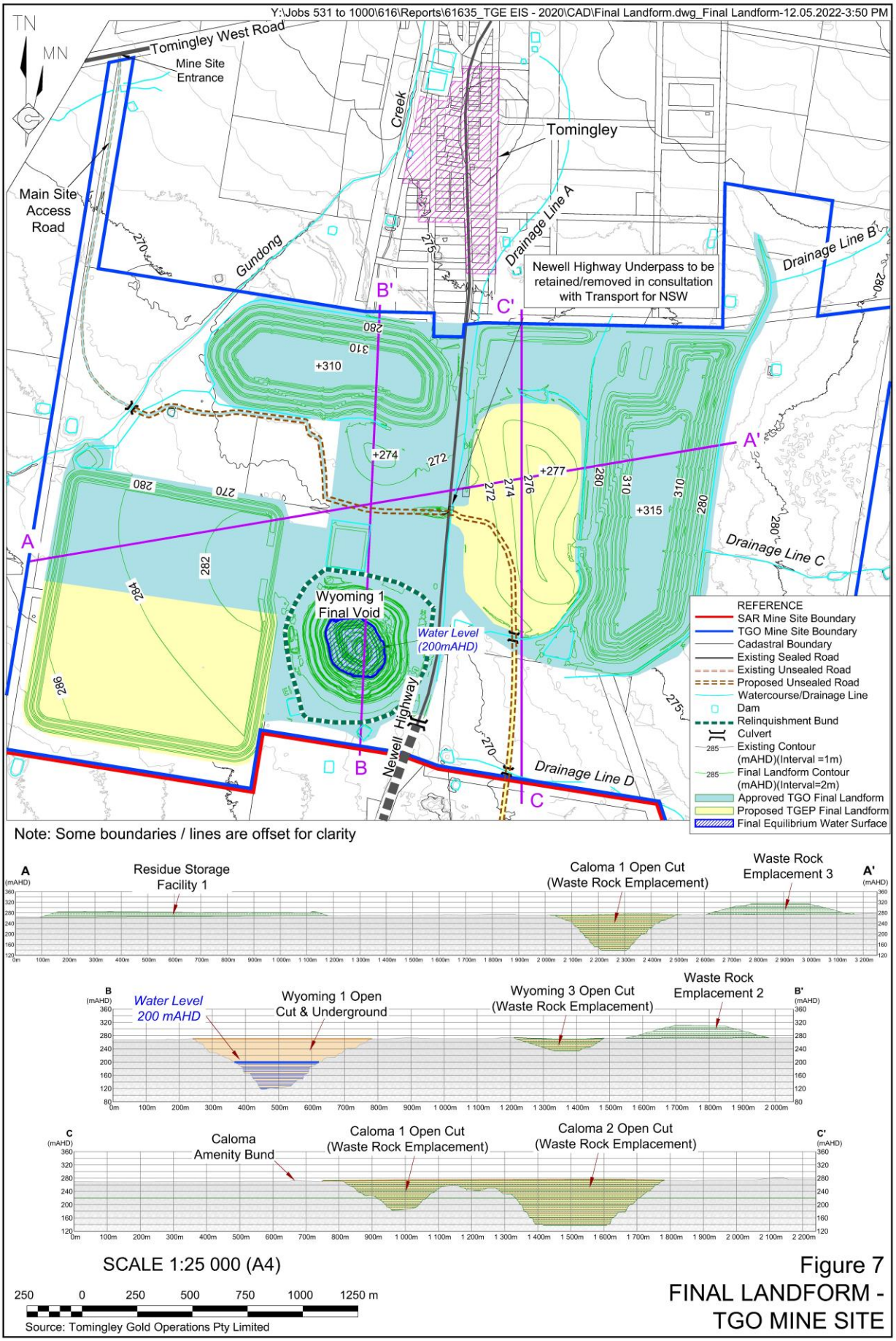


Figure 7
FINAL LANDFORM - TGO MINE SITE

The Project would result in the establishment of the SAR Open Cut comprising three sub-pits, the South, Central and North Pits. Section 3.14.3 and Figures 3.14.1 to 3.14.3 present the proposed final landform should the Project be approved, including the following.

- Three fully backfilled open cuts, namely the Wyoming 3, Caloma 1, Caloma 2 Open Cuts and two fully backfilled sub-pits, namely the SAR South and Central Pits.
- Two final voids, namely the Wyoming 1 Open Cut and the SAR North Pit.

The Applicant notes that the SAR North Pit will be the final Open Cut to be mined within the SAR Mine Site. As a result, backfilling of that void would not be feasible because there would be no material available for backfilling and relocating previously mined waste rock would be cost prohibitive.

Similarly, the Wyoming 1 Open Cut would continue to act as the primary access for the approved TGO and proposed SAR Underground Mines which would continue to operate following the completion of surface mining operations. As for the SAR North Pit, there would be no material available for backfilling of the Wyoming 1 Open Cut final void and relocating previously mined waste rock would be cost prohibitive.

Finally, the Applicant notes that it is currently and would continue to actively manage geotechnical aspects of its open cut operations and would ensure that all final voids would comply with relevant geotechnical mine closure criteria.

In light of the above, the Applicant contends that the Project as proposed would result in the most feasible and environmentally sustainable option to minimise the sterilisation of land post-mining.

Final Void Relinquishment Criteria

Further information is required to address inconsistencies between the geotechnical (open pit stability) assessment reports prepared by AMC and risk control proposed in the EIS. In particular, AMC has recommended Factor of Safety (FoS) of 1.5 is appropriate for long term stability of final void slopes which is inconsistent with the FoS of 1.3 adopted in the risk assessment provided in the EIS (Section 3.14.5).

Information is also required on the adoption of the recommended FoS of 1.5 into the final void pit profile design and the corresponding resulting setback and larger footprint required at closure. This is required for both Wyoming One and SARs pit at closure. Consideration is also required for how a revised final landform profile will result in revised erosion parameters and a different result for the predicted erosion provided by the Landform Evolution Modelling undertaken.

Response

Section 3.14.5 of the EIS identifies that the Applicant would ensure that the final SAR North Pit void would achieve a Factor of Safety of 1.3. The Applicant assumes that the Regulator's reference to AMC's recommendation for a Factor of Safety of 1.5. has been derived from Section 6.1 of AMC (2021), presented as Appendix 6 of the EIS. That report was prepared to address a range of geotechnical matters within the existing Wyoming 1 Open Cut, not the SAR North Pit final void.

The criteria for the SAR North Pit and Wyoming 1 final voids have been derived from t *Guidelines for Open Pit Slope Design* (Read and Stacey, 2009). That document, identifies a range of acceptance criteria for open cut stability as follows.

- In cases where there would be a high consequence as a result of an open cut wall failure, Factors of Safety of between 1.3 and 1.5 are recommended.
- In cases where there would be a low consequence as a result of an open cut wall failure, Factors of Safety of between 1.2 and 1.3 are recommended.

In the case of the Wyoming 1 Open Cut, substantial infrastructure exists around the Open Cut. A significant failure event has the potential to adversely impact on the existing or proposed Newell Highway or other mining-related infrastructure, both of which are located approximately 95m from the closest point of the Open Cut. As a result, the Applicant concurs with the determination of AMC (2021) that a Factor of Safety of 1.5, or the upper end of the "high consequence" range is appropriate for the Wyoming 1 Open Cut.

By contrast, the SAR North Pit is located in an area of agricultural land, with a minimum 550m offset to the closest significant public infrastructure, namely the Newell Highway and the realigned Kyalite Road. In addition, a 50m buffer has been provided around the proposed Open Cut (see also discussion below re the proposed open cut layout) As a result, the Applicant proposes a Factor of Safety of 1.3, or the upper end of the "low consequence" range is appropriate for the SAR North Pit.

In relation to additional setback for the proposed SAR North Pit, the Applicant notes that the Open Cut as presented in the EIS is based on the Whittle optimisation with a conservatively high assumed gold price of A$3,000/oz. This was done to ensure that the Open Cut as proposed would be the largest that would feasibly be constructed in the current gold pricing environment. In reality, the Open Cut to be mined is highly likely to be smaller, potentially substantially smaller, than proposed. This approach has been adopted to account for a range of potentially unanticipated eventualities, including geotechnical issues, that may be identified during initial mining operations of the Southern and Central Pits and to avoid the need for a subsequent application to permit an enlargement of the Open Cut. As a result, the Applicant contends that it has adequately included contingencies for potential setbacks and unplanned events during the life of the Open Cut and that no further contingency is required.

Final Void Mitigation of Erosion

Based on the outcome of variations to the final void pit design, an assessment of options to address erosion and improve stability for the final voids requires consideration. This may require an assessment of suitable materials available to improve the stability of the upper benches of final voids i.e. growth medium for vegetation growth or other material that may armour and reduce erosion to acceptable levels in the long-term for the exposed alluvium and saprolite material.

Response

Table A4.1 of Appendix 4 of the EIS identifies that the proposed wall angles for the SAR North Pit within alluvial and saprolite material would be between 29° and 46°. Such angles are too steep to allow soil to adhere to the surface or to allow plant or personnel to access the face to revegetate or maintain any vegetation that may be established. As a result, revegetation of the upper sections of the North Pit face is not considered to be feasible.

Given that the *Open Cut Erodibility Assessment* (Landloch, 2021), presented as Appendix 7 of the EIS, identified that the Open Cut would likely erode at a rate of only 2m/100 years or 20m over the 1000-year period modelled, the Applicant contends that the rate of erosion is not unreasonable and that additional management measures are not required.

4.2.10.4 Tailings Management

Alternative Tailings Management Constraints Analysis

Information is required on a constraints and opportunities analysis of different tailings management techniques (e.g., co-disposal, dewatering tailings, integrated landforms, etc.) and of alternative techniques to reduce the amount of tailings and reliance on conventional tailing storage facilities. This analysis should re-assess options for in-pit emplacement.

Response

The Applicant has previously addressed alternative tailings management options as part of Modification 5 (the construction of RSF2). As part of the *Modification Report* for Modification 5, GHD undertook an assessment of alternate locations for RSF2, including an assessment of alternate tailings management options. That assessment, referred to hereafter as GHD (2019) and presented as part of the *Modification Report* for Modification 5, was undertaken in the context of a holistic review of residue management options for the extension of the life of the Tomingley Gold Mine and for the Tomingley Gold Extension Project as it was then understood. It is noted that that report refers to the proposed RSF as "RSF3" not "RSF2." During preparation of this *Submissions Report*, the Applicant consulted with GHD to confirm that the results of the existing options assessment remain current

The following subsections provide a brief constraints and opportunities analysis of a range of tailings management options, including in-pit tailings. It is noted that the Project would involve the use of a paste fill plant. The use of paste fill would reduce the volume of residue storage required. Information on the proposed Roswell Paste Fill Plant is provided in Section 3.5.3.2 of the EIS.

Dry Stacking of Residue

Dry stacking of residue involves filtering the tailings to produce a material with a moisture content of less than 20%. This material can then be stacked and compacted within a suitable facility.

Dry stacking of tailings has the advantage of potentially reducing the size of the Facility and embankment construction requirements, removing the need for a decant pond and increasing the strength of the placed residue.

Notwithstanding this, this option would have the following disadvantages.

- Unsustainable additional capital and operational costs associated with replacement of existing residue transfer and placement infrastructure.
- Challenges with effective filtration to achieve the required rate of dewatering.
- Challenges with managing the Facility during prolonged high rainfall periods.

- Challenges associated with dust generation given proximity to Tomingley village and surrounding rural residences.
- Unacceptable operational risk due to greater process complexity and reliance on equipment availability and performance.

As a result, the option of dry stacking of residue was considered and determined not to be a feasible alternative.

Use of Geotubes

The Applicant considered the use of geotubes or engineered geotextile bags designed for dewatering sludge and slurry. The tubes facilitate the passive dewatering of residue, potentially increasing the density of the residue from 1.4t/m^3 to 1.6t/m^3 (GHD, 2019), with the resulting benefit of a reduced storage volume.

This option has been rejected, however, because of the substantial additional operational costs and the fact that the use of geotubes would prevent future lifts of the Facility.

Amphirol Mud Farming

Amphirol mud farming is a technique that uses specially designed equipment to break up the surface of deposited tailings, create dedicated drainage channels to a central decant pond and dewater tailings. This technique is typically used in circumstances where very fine tailings are generated, such as in bauxite mining. Such residue typically does not form a beach or dewater easily. The residue generated by the TGO Mine is a fine sand, approximately 100µm in size, the material generally forms a beach with a slope of approximately 1% and releases contained water relatively easily to achieve the required settled density. As a result, this option has been rejected by the Applicant.

Integrated Waste Landform

An integrated waste landform is one in which tailings and waste rock are mixed and placed into a single emplacement. The document *Leading Practice Tailings Management for Successful Closure* published by the Resources Regulator in June 2020 states that an integrated waste landform is one that involves the combination and mixing of tailings and waste rock before disposal. The Resources Regulator states that integrated waste landforms have the potential to produce combined waste of improved density and strength, resulting in a more robust storage facility.

The Applicant considered this option and rejected it for the following reasons.

- Integrated waste facilities require competent waste rock to provide strength and durability for the resulting facility. A substantial proportion of the waste rock to the generated by the Project would be alluvial and saprolite material, a clay-rich, low strength material unsuitable for mixing with tailings.
- Scheduling of waste rock extraction would result in variable generation of competent waste rock throughout the life of the Project, with only low strength alluvial and saprolite material generated during the initial SAR Open Cut mining operations and no or limited waste rock produced during the final stages of open

cut mining operations and during underground-only mining operations. Use of an integrated waste landform would therefore require both a traditional Residue Storage Facility and an integrated facility.

- The Environment Protection Authority's *Tailings Storage Facility Liner Policy* requires that all facilities receiving tailings achieve a permeability of 1 x 10^{-9}m/s over a 1m or equivalent. At the TGO Mine, this requires construction of an engineered clay liner using *in situ* clay. Mixing waste rock and tailings would very substantially increase the volume of material that would be required to be stored within a lined facility, thereby substantially increasing the area required for such a facility, resulting in additional disturbance and substantially higher capital costs as the entire footprint would need to be lined.

As a result, this option has been rejected by the Applicant.

In-pit Placement of Tailings

An application for an in-pit placement of residue within the Wyoming 3 Open Cut was prepared in 2016. Substantial resources were devoted by the Applicant to the design of the facility and an application to modify MP 09_0155 was prepared. A draft of the application was provided to the Department of Planning and Environment and the Environment Protection Authority and considerable consultation was undertaken with both agencies.

The Environment Protection Authority maintained that the Proposal did not comply with the above *Tailings Storage Facility Liner Policy*. After numerous discussions and attempts by the Applicant to resolve the Environment Protection Authority's concerns, the Proposed Modification and the concept of an in-pit residue placement was abandoned.

Subsequently, the Applicant has consulted the Environment Protection Authority in relation to this matter and was advised that the *Tailings Storage Facility Liner Policy* was unchanged and that the Environment Protection Authority, in the absence of additional information, was unlikely to change its earlier advice.

Following its inability to obtain approval for in-pit residue placement, the Applicant has amended its mine plan and all open cuts that could potentially be used for in-pit residue placement are to be used for a different purpose as follows.

- The Caloma 1 and Caloma 2 open cuts and SAR South and Central Pits are to be used for waste rock storage.
- Wyoming 1 Open Cut and SAR North Pit are to remain as final voids as underground mining under the voids will continue following completion of open cut mining.
- The Wyoming 3 Open Cut has largely been backfilled with waste rock and is currently being used for water storage. Following mine closure, the Open Cut is to be used to store excess hardstand and other materials, including material sourced from the ROM Pad. In addition, with only approximately 1Mm^3 of capacity remaining, the volume of residue that could be stored would not provide adequate capacity and an additional out-of-pit tailings facility would be required anyway.

As a result, the option of in-pit residue placement is not feasible and has been rejected on multiple occasions by the Applicant.

Information is required on the capping design and if an adequate volume of suitable material will be available to construct the cap. This includes information on the capping performance requirements to support the final land use of agriculture, including an assessment of likely vegetation type to be installed and inevitable tree growth.

Response

A detailed design for the closure and capping of the combined Residue Storage Facility is currently in progress. Notwithstanding this, based on the following assumptions, the Applicant has estimated the approximate volumes of material that will be required to cap the combined Residue Storage Facility.

- 4 cells at approximately 400m x 400m in size
- A three-zone cap comprising
  - a basal general fill layer assumed to be and average of 1m thick;
  - a central impermeable clay layer assumed to be 0.5m think;
  - a rock mulch layer assumed to be an average of 1m thick; and
  - growth medium assumed to be 0.15m thick.

Based on the above, the following volumes of capping material will be required.

- Basal general fill zone .....640 000m^3
- Clay zone.....320 000m^3
- Rock mulch .....640 000m^3
- Growth medium.....96 000m^3

Section 3.6.3 of the EIS identifies that approximately 81.8Mm^3 of waste rock would be produced by the Project, critically including a range of materials, including clay-rich material and materials suitable for creating a rock mulch. Section 3.3.2 of the EIS also identifies that approximately 1.2Mm^3 of topsoil and 1.7Mm^3 subsoil would be available to be stripped during establishment of the SAR Mine Site, with substantial soil resources already stockpiled within the TGO Mine Site.

In light of the above, adequate material would be available to cap and rehabilitate the combined Residue Storage Facility.

Information is required on the design of the surface water management on the tailings for closure and design of drop-structure/spillway and if this will meet requirements of industry-accepted guidelines ANCOLD and Global Tailings Standard.

Response

This matter has been addressed in Section 4.2.10.3.

4.2.11 Rural Fire Service

The NSW Rural Fire Service has reviewed the information provided and raises no objection to the proposed development, subject to the compliance of the development with the relevant guidelines in Planning for Bush Fire Protection 2019.

It is noted that previous approvals issued for the development were based on the provisions of Planning for Bush Fire Protection 2006, and as such, a report prepared by a suitably qualified consultant should be provided which demonstrates the developments compliance with the current legislated document Planning for Bush Fire Protection 2019. In this regard, the consultants report should address, but not be limited to, the following sections of Planning for Bush Fire Protection 2019:

- *Section 8.3.6 - Mining (underground and open cut) and petroleum production*
- *Section 8.3.9 - Hazardous Industry*

Response

The Applicant considers the approach taken to assess the hazards and risks associated with the Project to be suitable based on the assessed risk profile of the Project and the Applicant's history and performance regarding bushfire risk management for the existing and approved TGO Mine.

Furthermore, *Planning for Bush Fire Protection 2019* was considered during the preparation of the qualitative Bushfire Assessment undertaken for the Project and presented as Section 6.13.2 of the EIS. This included a review of the assumptions used in the original Bushfire Assessment for the TGO Mine and the calculation of a suitable Asset Protection Zone for the SAR Administration Area in consideration of the methods presented in Appendix 1 of *Planning for Bush Fire Protection 2019.*

The methodology used by the Applicant is generally in accordance with *Section 8.3.6 - Mining (underground and open cut) and petroleum production* which includes the following requirements.

> Where mining and associated activities are carried out on BFPL [Bush Fire Prone Land], consideration should be given to any hazards and risks associated with bush fire. It may be necessary to implement measures to control and manage any identified hazards and risks… As a minimum, a 10m APZ [Asset Protection Zone] should be provided around any infrastructure associated with mining and petroleum production. Given the potential hazard and risks, a Bush Fire Emergency Management and Operations Plan should be prepared to cover any mining activities and petroleum production undertaken on BFPL…

The Applicant contends that the proposed infrastructure with the highest risk of impacts to or from bushfire would be the SAR Administration Area and the SAR Magazine; neither of which is located on or in the vicinity of Bush Fire Prone Land. In addition to the above, the majority of Project-related activities that would occur on Bush Fire Prone Land involve the clearing of all surface vegetation, effectively eliminating or significantly reducing the risk of bush fire in these areas during the operation of the Project. The proposed layout of the Project would not present a high-risk bush fire environment.

The proposed management and mitigation measures described in Section 6.13.2.5 of the EIS are considered suitable for the predicted bush fire risk environment of the Project. In addition, information on the proposed land management practices of lands within and in the vicinity of the

Project Site is presented in Section 6.9.3 of the EIS. In summary the proposed mixed agricultural land management processes would provide additional bush fire risk management in the form of grazing and fuel reduction.

Based on the predicted bush fire risk environment, the existing bush fire risk management and mitigation measures and those provided in Section 6.9.3 of the EIS, a specific Bush Fire Emergency Management and Operations Plan is not considered necessary for the Project.

The Applicant considers the requirements of *Section 8.3.9 – Hazardous Industry* to be not directly relevant to the Project based on the following.

- The Project would be considered a "potentially hazardous industry" in accordance with *State Environmental Planning Policy 33 – Hazardous and Offensive Development* (now *State Environmental Planning Policy (Resilience and Hazards) 2021*).
- The existing bush fire risk environment of the TGO Mine Site is considered to be well understood and has been developed and managed by the Applicant for over 10 years.
- The Project would not result in a significant change to the existing bush fire risk environment when compared to the existing and approved TGO Mine.
- The principal risk source for bushfire, namely the storage of explosives and related compounds was assessed as part of the Preliminary Hazards Analysis, as presented in Appendix 17 of the EIS.

4.2.12 Transport for NSW

The following responses have been prepared by the Applicant in consultation with Constructive Solutions Pty Limited (Constructive Solutions). Constructive Solutions prepared the *Integrated Traffic Assessment* (ITA) for the Project, as presented as Part 1 of the *Specialist Consultant Studies Compendium* and hereafter referred to as Constructive Solutions (2021) and the *Newell Highway 100% Concept Design Report*, as presented as Appendix 5 of the EIS (Volume 1).

The Applicant notes that TfNSW indicated that the following comments are in relation to the ITA for the Project. Notwithstanding the following responses include, where relevant, information present in the EIS.

4.2.12.1 General Comment

No information provided on the intended extraction rates or the method of transportation of the extracted material.

Response

Section 3.5.4.2 of the EIS presents the anticipated extraction rates for the Project. As per current TGO Mine practices, all ore and waste rock would be transported using the existing and proposed internal road network. No waste rock or ore is proposed to be transported on public roads.

4.2.12.2 Traffic Volumes

Section 2.4.1 – Traffic Volumes - It is noted that the AADT [Annual Average Daily Traffic] *provided varies between the AADT data on Traffic Volume Viewer for Station ID T0251. Clarification is required to confirm the discrepancy between the survey data and the Traffic Volume viewer Station ID T0251.*

Response

The Applicant acknowledges that the incorrect Annual Average Daily Traffic values for the Newell Highway are presented in Constructive Solutions (2021). Constructive Solutions confirms that the correct Annual Average Daily Traffic as measured for the Newell Highway between Kyalite Road and Back Tomingley West Road is 2224 and not 4448.

It is noted that the closest traffic counting station available on Traffic Volume Viewer is Station ID 6149. The Annual Average Daily Traffic value for Station ID 6149 over the same period as that used by Constructive Solutions (2021) is 2179.

A revised *Integrated Traffic Assessment* has been prepared by Constructive Solutions and is presented as **Appendix 4**. That assessment is referred to hereafter as Constructive Solutions (2022). In summary, there is no substantial change to the assessed traffic-related impacts, with the identified error resulting in an assessment that conservatively overestimates traffic-related impacts.

Section 2.4.1- [Existing] *Traffic Volumes- Table 5- identifies the existing traffic volumes as an AADT with HV%* [percentage of Heavy Vehicles]. *It is unclear as to the location of the traffic counts provided for Back Tomingley West Road, Kyalite Road and McNivens Lane, this data does not appear to be representative of the background AADTs for the Newell Highway (HW17) at these intersections. Clarification is required as to the location of the surveys and how the AADTs were derived for these intersections.*

Response

The Applicant contends that Table 5 of Constructive Solutions (2022), replicated below as **Table 5**, clearly identifies the location of the traffic counts for Back Tomingley West Road and Kyalite Road. No traffic counts were undertaken at McNivens Lane, as indicated in Note 3 in **Table 5**.

The Applicant's response to numerical discrepancies is addressed above.

Section 2.4.1- [Existing] *Traffic Volumes- it is unclear what the AM/PM peak is proposed for the construction traffic associated with the Tomingley Gold Mine Expansion Project* (sic) *and road work construction, the AM/PM peak during the operation of the Tomingley Gold Mine and the distribution splits between the McNivens Lane, Back Tomingley West Road and the Kyalite Road intersection during construction of the road works and the Tomingley Gold Mine Expansion* [sic].

Response

Section 2.4.1 of Constructive Solutions (2021) addresses existing traffic volumes only. Peak traffic volumes during the Construction and Operational phases of the Project are provided in Sections 4.6.4 and 4.6.5 of Constructive Solutions (2021).

Table 5
Existing Traffic Volumes

Road	Traffic Counter Location	Existing Traffic (2020)	
		AADT	HV (%)
HW17[1]	Between Kyalite Road and Back Tomingley West Road	2 224	44.8
Back Tomingley West Road[1]	Approximately 100m on the approach to HW17	34	9.8
Kyalite Road[2]	Approximately 100m on the approach to HW17	22	41.3
McNivens Lane[3]	-	15	10

Note 1: 2 week period from 19 August 2020 to 1 September 2020.

Note 2: 13 week period from 1 November 2019 to 24 January 2020.

Note 3: Assumed existing traffic volume given traffic is considered to be less than Kyalite Road as evidenced by its length and the number of properties serviced.

Source: Constructive Solutions (2022) –Table 5, Section 2.4.1

Section 2.4.1- Existing traffic volumes- No information has been provided on the existing traffic volumes for the Kenilworth access proposed to be used during construction.

Response

The 'Kenilworth access' is a private access road, primarily used by residents accessing the 'Kenilworth' Property. This Property is owned by the Applicant and the existing Residence (referred to as R46 in the EIS) has been removed. As a result, existing traffic using this private access is negligible.

4.2.12.3 School Bus Services

Section 2.5-School Bus Services [Section 2.5 Bus Services]- *identifies that school buses run along Kyalite Road, Back Tomingley West Road, Tomingley West Road which are likely to be impacted by the proposed realignment and the operational phase of the Tomingley Gold Mine expansion* [sic]. *No information has been provided as a part of the ITA as to how the impacts of the realignment will be mitigated or minimised throughout the different stages of construction of the Tomingley Gold Mine expansion* (sic).

Response

Section 2.5 of Constructive Solutions (2021) addresses existing bus services. Further information on the potential impacts to existing bus services is provided in Section 4.11 of Constructive Solutions (2021). In summary, it is considered unlikely that the construction and operational phases of the Project would impact on these school bus services. The operator of the school bus service to Peak Hill was consulted on 26 March 2021 and 18 May 2021 in relation to the proposed Kyalite Road realignment options. Feedback during that consultation was that the proposed road realignment would not adversely impact on the operation of the school bus route and that the proposed intersection upgrades would likely facilitate improved services.

Based on the above, no specific management and mitigation measures would be required or are proposed by the Applicant in regard to bus services.

4.2.12.4 Construction Compound Intersection Design and Operation

Section 3.1.1- Road Construction Compound [Area] *and Section 3.1.2- SAR Mine Site Construction Compound Area. It is identified within these section* [sic] *that the right turn movement from the Newell Highway onto Kyalite Road for construction workers associated with the realignment would be restricted from turning right from the northbound direction. There is no mention as to how this will be controlled or managed.*

Response

Section 3.1.1 of Constructive Solutions (2021) states the following.

> For construction associated with the realignment of Kyalite Road (including the overpass), construction workers travelling northbound along HW17 would be prevented from turning right in the existing Kyalite Road intersection. This requirement would be reinforced by the use of appropriate roadside signage as well ongoing notification to workers during the construction phase. Workers travelling from the south would continue through to the village of Tomingley and turn right into the existing truck stop rest area before travelling back south along HW17 and then turning left into the existing Kyalite Road intersection.

The Applicant contends that the above would be included as part of the revised *Traffic Management Plan* identified in Section 4.1 of Constructive Solutions (2021) and Section 6.2.4.1 of the EIS.

See also discussion below.

Section 3.1.1- identifies that LV/HV [Light Vehicles/Heavy Vehicles] *will utilise the McNivens Lane/HW17 and Back Tomingley West Road/HW17 intersection for the construction of the road work. There is no mention of the traffic volumes or distributions associated with the McNivens Lane/HW17 and Back Tomingley West Road/HW17 intersection and there has been no assessment of the Figure 3.25 of Austroads Guide to Traffic Management Part 6 for these intersections during construction. The ITA will need to be reviewed to provide the traffic volumes and distribution splits utilising these intersections in accordance with Figure 3.25 of Austroads Guide to Traffic Management Part 6 and provide a strategic concept design based on the outcome of this assessment.*

Response

The Applicant anticipates that no more than 25 to 30 heavy vehicles per day would utilise the McNivens Lane or Back Tomingley West Road intersections with the Newell Highway during construction operations. All those movements would be exiting movements, with heavy vehicles required to enter the construction zone via the proposed temporary "Kenilworth" Property access. Light vehicle movements during construction operations would also be limited, with the vast majority of those to also occur via the "Kenilworth" Property access.

In light of the above, Constructive Solutions state that there would be no requirement for temporary upgrades of the McNivens Lane or Back Tomingley West Road intersections and none are proposed.

Section 3.1.2-SAR Mine Site Construction Compound Area identifies that the access for construction workers associated with the Tomingley Gold Mine expansion [sic] *would utilise the Kyalite/Newell Highway intersection, however there is no mention as to the requirement to restrict the right turn for the workers associated with the Tomingley Gold extension project. The ITA is required to be revised to clarify the application of the restriction of the right turn movements at the Kyalite/Newell Highway intersection or provide an assessment of the intersection treatments required for the right turn at this intersection in accordance with Figure 3.25 of Austroads Guide to Traffic Management Part 6.*

Response

Section 3.1.2 of Constructive Solutions (2021) identifies that access to the SAR Mine Site for mine construction workers would be via a temporary site access from the existing Kyalite Road (not the Newell Highway as assumed by Transport for NSW). The limitation re right hand turn movements for north-bound traffic on the Newell Highway into Kyalite Road is addressed Section 3.1.1 of Constructive Solutions (2021) and is discussed further below.

Management of the Kyalite Road/Newell Highway intersection would be addressed as part of the revised *Traffic Management Plan*.

Section 3.1.1 identifies the Heavy Vehicle Exit point 1 utilising intersection of McNivens Lane/HW17 and [Heavy Vehicle Exit Point] 2 utilising the HW17/Back Tomingley West Road intersection. There appears to be no mention of ingress for heavy vehicles or the heavy vehicle design vehicle.

Response

Section 3.1.1 of Constructive Solutions (2021) identifies the entry point for Heavy Vehicles is the "Proposed Entry and Light Vehicle Exit Point" located at the 'Kenilworth' Property access point. It is acknowledged that Constructive Solutions (2021) implies but does not explicitly state that this entrance to be used for

- entry of both light and heavy vehicles; and
- exit of light vehicles only.

The Applicant acknowledges that the specific heavy vehicle design vehicle was not stated in Constructive Solutions (2021). The design vehicle is a 19m long Semi-trailer.

It is noted within [Section] 3.1.1 that the road construction workforce travelling from the south would be required to continue through to the village of Tomingley and turn right into the existing truck stop rest area before travelling back south along HW17 to turn left into the Kyalite Road intersection. TfNSW does not support the use of the Tomingley rest area to allow for traffic to continue northbound [southbound] to turn left into Kyalite Road from the Newell Highway and alternative measures should be considered.

Response

The Applicant notes that the proposed U-turn bay would be located at the Tomingley South Heavy Vehicle Rest Bay, approximately 2.5km to the south of the Tomingley village. The Applicant anticipates that the Rest Bay would, with the concurrence of Transport for NSW, be

temporarily closed during construction and heavy vehicles would use the Tomingley Village Heavy Vehicle Rest Area located within the Tomingley village. Most heavy vehicles already use the rest area within Tomingley Village because of the greater range of facilities available, with the Tomingley South Heavy Vehicle Rest Bay only rarely used.

Alternatively, in the event that Transport for NSW does not concur with the temporary closure of the Tomingley South Heavy Vehicle Rest Bay, the Applicant would, in consultation with Transport for NSW, extend the temporary 80km/h speed zone proposed for the "Kenilworth" site entrance during construction operations to include the existing Kyalite Road intersection and establish a temporary Channelised Right turn short treatment (CHR(s)) at the intersection of the existing Kyalite Road and Newell Highway. A second, non-preferred alternative would be to establish a turning bay on the Applicant's own land off McNivens Lane.

4.2.12.5 Intersection Design

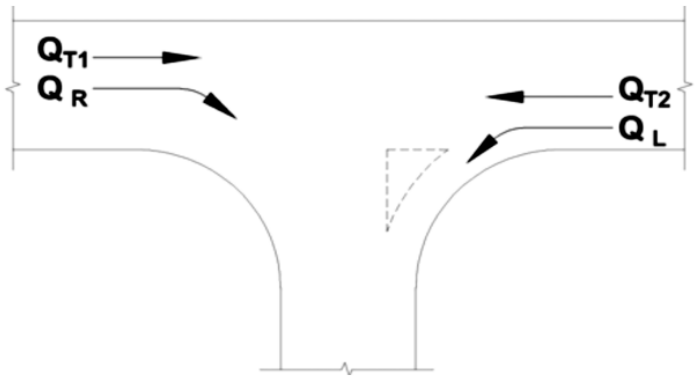
Section 4.6.4.1- Road Construction Compound Area Access Point ("Kenilworth" Property)- The warrants assessment presented for the Kenilworth access which is the construction compound area identifies the value of QM for the background traffic for the left turn as QT2 which is 168vph. Austroads Part 6 Guide to Traffic Management identifies that on a two-way two-lane road the QM is equal to QT1+QT2 which in this case would result in the background traffic for the left turn being measured at 360vph and not 168vph changing the current result from a CHR/BAL to a CHR/AUL(s). Clarification is required by the proponent as to why a CHR/BAL is warranted over a CHR/AUL(S)..

Section 4.6.4- intersection upgrades - Kyalite/Newell Highway temporary upgrade- the temporary upgrade has been assessed as requiring a BAL treatment and will mitigate the right turn through signage and TMP [Traffic Management Plan] *measures. The BAL was assessed on a background traffic volume equivalent to 168 vph instead of the required QT1+QT2 which would result in a background traffic volume of 340 pushing the BAL to an AUL based on a QM of 340 and a left turn of 97 vehicles. Clarification is required by the proponent as to the above assessment.*

Response

The Constructive Solutions advises that the correct QM value has been used to determine the design of the intersection of the proposed Road Construction Compound Area and Kyalite Road intersections with the Newell Highway. In summary, **Figure 8** reproduces Figure 3.26 of Austroads (2020) which identifies that QM = Q_{T2} not $Q_{T1} + Q_{T2}$.

Figure 3.26: Calculation of the major road traffic volume Q_M



Road type	Turn type	Splitter island	Q_M (veh/h)
Two-lane two-way	Right	No	= $Q_{T1} + Q_{T2} + Q_L$
		Yes	= $Q_{T1} + Q_{T2}$
	Left	Yes or no	= Q_{T2}

Figure 8
Calculation of Major Road Traffic Volume QM

Source: Modified after Figure 3.2.6 of Austroads (2020)

Section 4.6.4- intersection upgrades - identifies that the McNiven Road, Kyalite Road and the Back Tomingley West Road intersections with the Newell Highway upon realignment will be upgraded to CHR/AUL as per TfNSW comments and requirements with the review of the 50% Strategic Design for the realignment. The current 100% concept design identifies that the proposed intersection treatments at McNiven Road and Back Tomingley West Road are proposed to be a CHR/BAL intersection treatment. It does not appear within the ITA that sufficient justification or context has been provided to clarify the changes to the intersection treatments. Additional information will be required to provide sufficient justification in accordance with a warrants assessment as per Figure 3.25 of Austroads Guide to Traffic Management 6.

Response

The Applicant noted that Section 3.4.2.3 of the EIS identifies the following.

> "Constructive Solutions determined, based on existing and proposed traffic volumes, that the Kyalite Road intersection would require a Channelised Right (CHR) and Auxiliary Left (AUL) turn treatment. By contrast, the Back Tomingley West Road and McNivens Lane intersections would simply require a Basic Auxiliary Left (BAL) and Basic Auxiliary Right (BAR) turn treatment. Following consultation with the local community and Transport for NSW, the Applicant determined to apply a CHR/BAL treatment to each of the proposed intersections."

It is acknowledged that the last sentence included a typographical error and should have been as follows.

> "Following consultation with the local community and Transport for NSW, the Applicant determined to apply a CHR/AUL treatment to each of the proposed intersections."

Design files provided to Transport for NSW include CHR/AUL intersections for the proposed intersections.

Appendix 2 [3]- *HW17 realignment- 100% concept - The 100% concept design plans do not provide the strategic concept design for the temporary intersection treatments for the Kenilworth property that will be utilised for the light vehicle construction workforce associated with the alignment in the interim. It is noted Figure 3.25 of Austroads Guide to Traffic Management Part 6 assessment has identified the provision of temporary intersection treatments of a Rural Basic Left Turn (BAL) treatment and a Channelised Right turn short treatment (CHR(s)) at the property access, however a strategic concept design that captures the scope of the proposed design has not been provided and will be required as a part of the additional information.*

Response

The Applicant acknowledges that no strategic concept design for the Road Construction Compound Area access road intersection has been provided. Such a design will be prepared by Constructive Solutions and will be provided separately to Transport for NSW as a component of the ongoing road design verification and approval process.

4.2.12.6 Heavy Vehicles

Section 4.1.1-Heavy Vehicles- This section does not identify the design vehicle proposed to be utilised during construction and operation of the development.

Response

The Applicant acknowledges that the specific heavy vehicle design vehicle for the construction phase was not stated in Constructive Solutions (2021). As identified above, the heavy vehicle design vehicle used for the design of construction compound access intersections would be a 19m Semi-trailer.

Section 4.4 identifies that the design vehicle for the final Kyalite Road, McNivens Lane and Back Tomingley West Road intersection designs would be a B-triple.

Section 4.1.1- Heavy Vehicles- This section does not identify the haulage routes for heavy vehicles or OSOM [Over Size and Over Mass] *deliveries during construction.*

Response

The Applicant acknowledges that no specific Heavy Vehicle Haulage Route is identified in Constructive Solutions (2021) or the EIS. Notwithstanding the above, the Project is bisected by the Newell Highway, a State Road and major heavy vehicle haulage road. The Newell Highway would be the primary haulage route for heavy vehicles, including OSOM vehicles. Short sections of McNivens Lane, Kyalite Road and Back Tomingley West Road would be utilised for access from the Highway to the construction areas.

4.2.12.7 Property Ownership, Acquisition and Access

Section 4.3.3- Land swaps - It is noted within this section that land swaps to create the road corridors through the process of subdivision will commence on completion of the 100% concept designs acceptance by TfNSW and NSC [Narromine Shire Council]. *There is a risk to the proponent and the project of the commencement of this process prior to the approval of the Tomingley Gold Mine expansion* [sic].

Response

The Applicant acknowledges the risks associated with ongoing land acquisition and property boundary changes.

Appendix 2-HW17-realignment-100% concept - Clarification is required within the ITA that specifies how each property access that currently has an access along the current alignment of the Newell Highway has been provided an access within the Strategic Concept Design.

Response

The Applicant proposes to close four existing rural property access points associated with the Applicant's land holdings, namely:

- 'Kenilworth';
- 'Old Thornycroft'; and
- 'Rosewood' (x2).

The indicative locations of all rural property access points are presented as Appendix 5 of Constructive Solutions (2021). The design of all new rural property access points is shown as Figure 13 of Constructive Solutions (2021).

4.3 PUBLIC SUBMISSIONS

4.3.1 Introduction

Six public submissions were received. Five supporting submissions were received, with those submissions identifying the social and economic benefits of the Project to the local, regional and State community, as well as recognising the value of the Applicant's existing operations. One submission by way of objection was received from the Clark family. The Applicant has continued to engage with the Clark family since early 2021 and acknowledges both the family's legitimate concerns as one of the Project's fence-line neighbours and the constructive manner in which the family has approached discussions with the Applicant.

4.3.2 P and T Clark

4.3.2.1 Consultation

Representative Comment(s)

The road that we currently live on and access the Newell Highway daily for commutes to work, shopping and church is the very road that this project extension will be closing so they can proceed. The project does include our road being diverted to a new location, however it was only after numerous emails to our local council and finally a member of Alkane that we were even brought into any discussions about this. It took months of zero communication before someone made the decision to even speak to us.

We were part of the eventual consultation however it is difficult to believe that anything we requested or suggested was truly taken into account as we believe wholeheartedly that all decisions had already been made.

Response

The Applicant notes that the initial resource statement for the Project was released in April 2020. It was only after that date that preliminary mine planning could commence, and it was only in mid to late 2020 that the Applicant determined that the Project would include both underground and open cut mining operations and that that the open cut mining operations may impact on Kyalite Road. The Applicant was then required to undertake an engineering assessment to determine potentially feasible alternative alignments, with many critical aspects, including the size of the deposits and resulting mining operations, not fully known at the time. As a result, it was not until late 2020 that the Applicant had identified two preferred options for the realignment of Kyalite Road.

Initial consultation with the Clark family occurred on 19 January 2021. That consultation primarily focused on the realignment of Kyalite Road and sought feedback on the proposed options. As indicated in Section 2.5.6 of the EIS, at that time, the Applicant's preferred option was to divert Kyalite Road via Thornycroft Road because of the very substantial capital cost associated with the Kyalite Road overpass. However, considering community feedback, including from the Clark family, the Applicant's preferred alignment was discarded in favour of the current proposed alignment for Kyalite Road.

While acknowledging the family's frustration at perceived delays in commencing consultation and concerns that all decisions had been made prior to that occurring, the Applicant notes that in many cases insufficient information was available to commence public consultation earlier. In addition, the Applicant rejects the assertion that all decisions had been made prior to consultation occurring, as evidenced by the change in the proposed alignment of Kyalite Road.

4.3.2.2 Noise Impacts

Representative Comment(s)

We are extremely concerned about the noise impact we will face over the lifetime of this project. Both in the construction phase as well as the actual operation. The area we live in has only a handful of residences, so therefore very little noise. Hundreds of acres between residences. However we can already hear drilling at certain times of the night especially as well as feel the impact underneath our home of blasting.

We do not have the benefit of double brick walls, insulation or double glazed windows to keep the noise impacts as low as possible.

We are very concerned about the potential lack of sleep and how this will affect our mental health for the life of the project.

Response

The *Noise and Vibration Impact Assessment* for the Project was prepared by Muller Acoustic Consultants Pty Limited (MAC, 2021). That assessment included a comprehensive assessment of the potential noise impacts of the Project on all surrounding residences and other sensitive receivers, including the Clark family residence (Residence R60), during construction and operation of the Project. That assessment determined that there would be no exceedances of the nominated Project Noise Trigger Levels at R60.

Notwithstanding that, the Applicant acknowledges that the Project would involve a change to the existing noise amenity of the local area, including for the Clark family. In order to manage this, a comprehensive range of design and operational mitigation measures to reduce noise levels at surrounding receivers would be implemented. These would be supported by active management in response to triggers from multiple real-time noise monitoring terminals, including one in the vicinity of R60, that would permit the Applicant to proactively reduce noise generation when required.

During consultation it was identified by the Clark family that noise was a key issue of concern and the Applicant has committed to the following additional management measures.

- Installation of a real-time noise monitoring terminal in the vicinity of R60. This monitor would be programmed to notify the site supervisor(s) when operations reach noise levels approaching the respective Project Noise Trigger Levels. Once notified, the relevant site supervisor would be responsible for investigating the notification and implementing the corrective actions, as required.
- Negotiation with the Clark family of a Memoranda of Understanding, similar to those existing agreements with residents in Tomingley village, including installing and maintaining air conditioning units, installing insulation and double-glazing windows, and the offer of a financial contribution to offset any increases in costs related to running the air-conditioning unit.

4.3.2.3 Noise Monitoring

Representative Comment(s)

Noise monitors have been suggested, however are they checked independently of the mine operations or are they intending to monitor these with their own staff? How can we be assured that the results of monitoring are truly to ensure the lowest impact on our wellbeing and home or will the operators just continue to 'tick boxes'.

Response

The Applicant's *Noise Management Plan* states that attended noise monitoring is to be undertaken by a suitably qualified acoustic consultant. Independent attended noise monitoring is currently undertaken by MAC in accordance with *Australian Standard 1055:2018 Acoustics – Description and Measurement of Environmental Noise* (AS1055:2018). The calibration of the acoustic instruments is undertaken prior to and following all measurement, is accredited by the National Association of Testing Authorities, Australia, and complies with *Australia / New Zealand IEC 61672.1-2018 – Electroacoustics – Sound Level Meters- Specifications*.

The existing and proposed real-time noise monitors would be commercially supplied systems that would also comply with AS1055:2018. These systems would be maintained and calibrated by independent contractors as recommended by the manufacturer.

The results of the independent monitoring are published on the Applicant's website, in accordance with the conditions of the existing development consent and compliance with the Project's noise limits are subject to independent environmental audits and annual reporting to both the Department of Planning and Environment and Environment Protection Authority.

In light of the above the Applicant contends that noise monitoring at the TGO Mine Site is currently and, should the Project proceed, would continue to be independently and transparently managed and reported.

4.3.2.4 Blasting Impacts

Representative Comment(s)

Our home is approximately 90 years old, I do not wish to have to make repairs unnecessarily to my home due to blast impacts.

Response

MAC (2021) determined that the maximum blasting-related ground vibration level attributable to the Project at R60 would be 0.4mm/s or less. The relevant human comfort criteria adopted by the NSW Government is 5mm/s, with 5% of blasts permitted between 5mm/s and 10mm/s. Ground vibration trigger levels for damage to buildings, including older buildings, are typically substantially higher than those set for human comfort. As a result, the Applicant is confident that the Project would not result in damage to any structures surrounding the Project Site, including the Clark family home.

Notwithstanding this, the Applicant is aware from discussions with the Clark family that this issue is a concern for the family and has committed to the installation of a blast monitor in the vicinity of R60. In addition, the Applicant would, if requested by the family, commission a structural survey of the residence prior to the commencement of blasting operations.

4.3.2.5 Complaint Management

Representative Comment(s)

I have looked at the current Tomingley Gold Projects website, in particular the listings of complaints from residences with the older mine. The majority of complaints were directly in regard to noise. I can see in my research that most of the solutions from TGP [sic] *were just to say that the noise levels fell within the rules of operation.*

I am concerned that the lack of regard for genuine complaints may be a large factor in the relationship between residents and the operators of the mine.

How can they truly respond and assist with these concerns.

Response

On receipt of a complaint, the Applicant's current procedures require it to:

- consult with the complainant in relation to the nature of the complaint;
- fully investigate and document the complaint and determine if further investigation or action is required; and
- provide the complainant with feedback in relation to the results of the investigation.

The Applicant maintains a full record of complaints on its website. A review of that data indicates that approximately 44 noise-related complaints were received between the commencement of mining operations in 2013 and 2017, with none since. Actions implemented as a result of noise related complaints included but were not limited to the following.

- Cessation of works in selected sections of the TGO Mine Site at certain times of day.
- Modifications to on-site equipment as appropriate.
- Installation of additional real-time noise monitoring equipment.
- Commissioning of a range of attended noise monitoring programs.
- Negotiation of Memoranda of Understanding with residents and installation of mitigation measures, including installation of double glazed windows, insulation and air conditioners and payments towards to the cost of operation of the air conditioners at 18 residences.

As a result, the Applicant contends that it has a well-established history of appropriately responding to complaints and actively investigating and rectifying issues as they are identified. It is acknowledged, however, that in some cases, despite the Applicant's best endeavours, complainants may not be satisfied with the Applicant's response to a particular complaint or issue.

4.3.2.6 Loss of Agricultural Land and Land Value

Representative Comment(s)

We do not want to see gold mines continue to seek development, drilling rights or more on perfectly beautiful agricultural land.

Response

The Applicant notes that mineral resources are a State-owned resource and that the holders of Exploration Licences and Mining Leases have, subject to associated regulatory and conditional requirements, the right to explore and extract those resources. The Applicant shares, however, the Clark family's concern regarding the loss of agricultural land. As a result, the Project includes the following measures to minimise adverse impacts on agricultural lands within and surrounding the SAR Mine Site.

- The Project has been designed in a manner that would minimise the area of non-productive land that would remain in the final landform.
- Soils to be disturbed would be stripped, stockpiled and respread in a manner that would maximise their viability and productivity during rehabilitation.
- Rehabilitated land would be returned to a mixture of Land and Soil Capability Class 4 and 6, similar to the classification existing land.
- The Applicant proposes to increase the agricultural productivity of the land under its control in such a manner that following the completion of mining operations, agricultural productivity as a whole is expected to be higher than the pre-mining landform.

Representative Comment(s)

The potential to de-value all the surrounding land is also a major concern. Land values play a large part in our equity position with finance institutions.

Response

It is acknowledged that impacts to land values is a common fear for landowners when considering a mining or other development that changes the local environment and is outside the control of the owner. The Applicant however notes that while a wide range of factors can affect land valuation, rural land valuation is primarily influenced by the agricultural income earning potential of the land. The Project would not adversely impact agricultural productivity of surrounding land, including that owned by the Clark family. Another important factor that influences the value of agricultural land is the demand for land and the size of the pool of potential purchasers. During consultation with surrounding landholders, the majority made requests to lease or purchase sections of the Applicant's land not required for mining operations, indicating that substantial demand for agricultural land in the vicinity of SAR Mine Site exists. Finally, the Applicant notes that the Project would continue to support the local economy through additional, non-agricultural commercial activity. This economic activity would in turn support land valuations within the local area.

4.3.2.7 Approval Status

Representative Comment(s)

It is difficult for us to believe that this Public Exhibition is anything more than just going through the motions. As stated before, we seem to be the last to find things out and this step is happening at the very same time we already can see surveyor flags and vehicles marking out the expected new route of the Kyalite Road entrance to the Newell Highway, as well as marking out the Newell Highway realignment. So the residents in the area, it looks like the mine already has all the approvals. That this project already is on the go, and that regardless of any of our concerns, things will be moving ahead.

Response

The approach taken by the Applicant for the preparation of the development application for the Project has at all times strictly adhered to the steps and processes required by the NSW Government for State Significant Developments.

The Applicant notes that to the extent possible that the Clark family have been consulted as soon an information has been sufficiently well developed to enable it to be made publicly available. Indeed in recognition of the proximity of the Clark family residence to the Project Site, the family were usually one of the first to be consulted throughout the process.

The Applicant notes that the presence of surveyor's marks and other related activities allows for its staff and contractors to understand where infrastructure may be constructed and to facilitate the detailed constraints analysis and design process.

Finally, the Applicant notes that determination of a State Significant Development and granting of all required licences, leases and approvals is a robust process, with very substantial technical input and involvement from a very wide range of NSW Government agencies and stakeholders and as such some degree of 'surveyors marks' are required to allow the detailed design and approval process to occur.

5. UPDATED PROJECT JUSTIFICATION

5.1 INTRODUCTION

A comprehensive evaluation and justification of the Project as exhibited is provided in Section 7 of the EIS.

Section 7 of the *Amendment Report* provides a justification of the Amended Project. The following subsections provide an updated justification and evaluation of the Project taking into consideration matters raised in the submissions.

5.2 ACTION TAKEN TO AVOID / MINIMISE IMPACTS

No amendments to the Project are required as a result of the submissions received. As a result, reference is made to the actions identified in Section 7.1 of the EIS and 7.2 of the *Amendment Report*. In addition, in light of the submissions received, the Applicant has committed and/or clarified the following actions that would avoid/minimise Project-related impacts.

- Biodiversity offsets would be secured in accordance with *Biodiversity Conservation Act 2016* without reliance on an on-site Stewardship Site.
- A range of additional measures to manage the Fuzzy Box Woodland Threatened Ecological Community would be implemented.
- The Applicant has reconfirmed its commitment to review and revise the groundwater model prior to 31 December 2024.
- The Applicant has continued to liaise with Narromine Shire Council in relation to a new Planning Agreement.
- The Applicant has reconfirmed its commitment to work with near neighbours, including P and T Clark, to ensure that Project-related impacts are minimised to the extent practicable.

5.3 CONSISTENCY WITH STRATEGIC CONTEXT

Section 7.2 of the EIS and 7.3 of the *Amendment Report* address the strategic context of the of the Project as exhibited and as amended respectively. No additional information is required to address the strategic context of the Project in light of the submissions received.

5.4 COMPLIANCE WITH STATUTORY REQUIREMENTS

Section 7.3 of the EIS and 7.4 of the *Amendment Report* address compliance with the statutory requirements for the of the Project as exhibited and as amended respectively. A range of submissions received from government agencies clarified matters associated with the Project's statutory requirements. Considering the submissions received, the Applicant notes the following.

- The Project would remain consistent with the objectives of the *Environmental Planning and Assessment Act 1979* and the objectives of the RU1 and SP2 zones of the *Narromine Local Environmental Plan 2011*.
- There is no change to the preconditions for approval and mandatory considerations identified in Appendix 15 of the EIS and Appendix B of the *Amendment Report.*

5.5 CONSISTENCY WITH COMMUNITY VIEWS

Six public submissions were received, with only one objecting to the Project. The number of public submissions received indicates that there is generally a low level of public interest in the Project. Notwithstanding this, the Applicant acknowledges the matters raised by the Clark family and has committed to continue to liaise with the family to manage and mitigate Project-related impacts, including mitigation measure at their residence.

5.6 SCALE AND NATURE OF ANTICIPATED IMPACTS

Section 7.5 of the EIS and 7.6 of the *Amendment Report* address the scale and nature of anticipated impacts of Project in terms of the precautionary principle and biophysical, social and economic impacts. Considering the submissions received, the Applicant contends that there are no additional impacts that have not been considered and that the scale and nature of anticipated impacts remain unchanged from those presented in the EIS and *Amendment Report*.

5.7 COMPLIANCE MONITORING AND COMMUNICATION

Section 7.6 of the EIS and 7.7 of the *Amendment Report* address compliance monitoring and communication for the of the Project as exhibited and as amended respectively. Considering the submission received from the Clark family, the Applicant has restated its commitment to monitoring environmental impacts at the Clark family residence and to maintaining open and honest communication with the family throughout the life of the Project.

5.8 REMAINING UNCERTAINTIES

Section 7.7 of the EIS and 7.8 of the *Amendment Report* address remaining uncertainties for the of the Project as exhibited and as amended respectively. As identified in Section 4.2.5.1, the Applicant contends that a peer review of the groundwater model is not required. Notwithstanding this, and to address perceived uncertainties in relation to the model, the Applicant will arrange for a peer review of the groundwater model to be completed. The submissions received did not identify additional uncertainties that are required to be addressed, managed or mitigated.

5.9 CONSEQUENCES OF NOT PROCEEDING

Section 7.8 of the EIS and 7.9 of the *Amendment Report* address the consequences of not proceeding with the Project. The submissions received did not raise any additional matters that would impact on the conclusions reached in those documents.

5.10 THE PUBLIC INTEREST

Section 7.9 of the EIS and 7.10 of the *Amendment Report* address the public interest as it relates to the Project. The submissions received did not raise any substantive concerns in relation to the public interest. Indeed, a number of submissions identified that the Project would be in the public interest and were supportive of the Project proceeding.

5.11 CONCLUSION

In conclusion, the Applicant contends that the submissions received do not raise any matters or considerations that would prevent approval of the application for development consent and development of the Project as described in the EIS and *Amendment Report*.

6. REFERENCES

AMC Consultants Pty Ltd (AMC) (2021). *SAR North Pit Long Term Slope Stability Analysis.* Prepared for Alkane Resources Ltd.

AREA Environmental & Heritage Consultants (2021). *Biodiversity Development Assessment Report,* Presented as Part 9 of the *Specialist Consultant Studies Compendium*. Prepared on behalf of Tomingley Gold Operations Pty Limited.

Austroads (2020). *Guide to Road Design.*

Constructive Solutions Pty Ltd (2021). *Integrated Transport Assessment,* presented as Part 1 of the *Specialist Consultant Studies Compendium*. Prepared on behalf of Tomingley Gold Operations Pty Limited.

Constructive Solutions Pty Ltd (2022). *Revised Integrated Transport Assessment,* presented as Appendix 5. Prepared on behalf of Tomingley Gold Operations Pty Limited.

Department of Primary Industries (DPI) (2013). *Agricultural Impact Statement technical notes: A companion to the Agricultural Impact Statement guideline.*

Department of Planning and Infrastructure (DP&I) (2012). *Strategic Regional Land Use Policy Guideline for Agricultural Impact Statements.*

GHD Pty Ltd (GHD) (2019). *TGO RSF 2 Concept Design Report,* presented as Appendix 2 of Modification 5.

GHD Pty Ltd (GHD) (2022). *TGO RSF 2 Stage 1 Detailed Design Report.* Presented as Appendix 13 of EIS.

Jacobs Australia Pty Limited (2021). *Groundwater Assessment,* Presented as Part 6 of the *Specialist Consultant Studies Compendium*. Prepared on behalf of Tomingley Gold Operations Pty Limited.

Landloch Pty Ltd (2021). *Open Cut Erodibility Assessment.* Presented as Appendix 7 of the *Environmental Impact Statement*.

Muller Acoustic Consulting Pty Ltd (MAC) (2021). *Noise and Blasting Impact Assessment,* presented as Part 3 of the *Specialist Consultant Studies Compendium*. Prepared on behalf of Tomingley Gold Operations Pty Limited.

Office of Environment and Heritage (OEH) (2012). *The Land and Soil Capability Assessment Scheme: Second Approximation.*

Read. J and Stacey. P (2009). *Guidelines for Open Pit Slope Design.* November 2009.

Sustainable Soils Management Pty Ltd (2021a). *Land and Soil Capability Assessment,* Part 7a of the *Specialist Consultant Studies Compendium*. Prepared on behalf of Tomingley Gold Operations Pty Limited.

Sustainable Soils Management Pty Ltd (2021b). *Biophysical Strategic Agricultural Land Assessment*, Part 7b of the *Specialist Consultant Studies Compendium*. Prepared on behalf of Tomingley Gold Operations Pty Limited.

Tomingley Gold Operations Pty Ltd (TGO) (2021). *Agricultural Impact Statement*, Part 8 of the *Specialist Consultant Studies Compendium*. Prepared by the Applicant in conjunction with R.W. Corkery & Co. Pty Limited.

Appendices

(Total No. of pages including blank pages = 160)

This page has intentionally been left blank

Appendix 1

Submissions Register

(Total No. of pages including blank pages = 4)

This page has intentionally been left blank

Table A1.1
Submissions

Submitter	Section Reference
Local Government Agencies	
Biodiversity, Conservation and Science Directorate	Section 4.2.2
Crown Lands	Section 4.2.3
Dams Safety NSW	Section 4.2.4
DPE Water	Section 4.2.5
DPI Agriculture	Section 4.2.6
DPI Fisheries	Section 4.2.1
Dubbo Regional Council	Section 4.2.1
Environment Protection Authority	Section 4.2.7
Heritage Council of NSW	Section 4.2.1
Heritage NSW	Section 4.2.1
Mining, Exploration and Geoscience	Section 4.2.8
Narromine Shire Council	Section 4.2.9
Parkes Shire Council	Section 4.2.1
Resources Regulator	Section 4.2.10
Rural Fire Service	Section 4.2.11
Siding Spring Observatory	Section 4.2.1
Subsidence Advisory	Section 4.2.1
Transport for NSW	Section 4.2.12
Organisations	
Westrak	N/A (submission in support)
Private Individuals	
Michael Bennett	N/A (submission in support)
Judith Bennett	
Jon Lamont	
Name Withheld	
Phil and Tony Clark	Section 4.3.2

This page has intentionally been left blank

Appendix 2

Updated Compilation of Measures to Mitigate Environmental Impacts

(Total No. of pages including blank pages = 18)

This page has intentionally been left blank

This *updated* compilation of the proposed management and mitigation measures for the Tomingley Gold Extension Project (the "Project") has been prepared in accordance with the NSW Government's *State Significant Development Guidelines – Preparing a Submissions Report* (November 2021).

Tables A2.1 and **A2.2** present a comprehensive list of the management and mitigation measures that Tomingley Gold Operations Pty Limited (the "Applicant") would implement for the Project in order to minimise the potential environmental impacts as far as practicable. Where changes have been made by the Applicant as part of this *Submissions Report*, these changes have been in identified as red underline text.

Any information presented in this Appendix supersedes that presented in Appendix 18 of the *Environmental Impact Statement* for the Project.

Table A2.1
Updated Proposed Construction Phase Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Off-site Construction of Public Roads		
Management Plans	The Applicant would prepare a *Public Road Construction Environmental Management Plan* that would address all relevant construction-related environmental management measures to be implemented during construction of the realigned Newell Highway and Kyalite Road and associated intersections. That Plan would be prepared in accordance with Transport for NSW *QA Specification G36 – Environmental Protection* and any conditional requirements of any development consent that may be issued for the Project.	Prior to commencement of road construction operations
On-site Construction of Site Infrastructure		
Management Plans	The Applicant would prepare a Mine Site Construction Environmental Management Plan that would address all relevant construction-related environmental management measures to be implemented during construction of on-site infrastructure in accordance with the conditional requirements of any development consent that may be issued for the Project.	Prior to commencement of site establishment operations

Table A2.2
Updated Proposed Operational Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Traffic and Transportation		
Infrastructure and Design	Design the realigned Newell Highway and Kyalite Road and associated intersections, including the temporary intersections in consultation with the road authorities (Transport for NSW and Narromine Shire Council) and ensure that the designs are consistent with the *Austroads Guide to Road Design*.	Prior to site establishment
Operational Measures	Obtain all necessary approvals from TfNSW and Council for all proposed road upgrade works prior to commencing these works.	Prior to site establishment
	Commission the infrastructure upgrade and road improvement works identified in Section 3.4 in accordance with the requirements of the *Roads Act 1993* prior to the commencement of mining operations within the SAR Mine Site.	Following the completion of road construction
	Decommission redundant sections of the Newell Highway, McNivens Lane and Kyalite Road and redundant property access points in accordance with the requirements of the *Roads Act 1993*.	Following the completion of road construction
	Decommission the Kyalite Road overpass and Newell Highway underpass prior to Mining Lease relinquishment in consultation with Narromine Shire Council and TfNSW.	End of Project life or as required
Management Plans	Prepare and implement a *Construction Traffic Management Plan* for the road construction phase of the Project.	Prior to site establishment
	Prepare and implement an *Operational Traffic Management Plan* (OTMP) for the operational phase of the Project.	Prior to Project operations
Visibility		
Infrastructure and Design	Construct the SAR Amenity Bund.	During site establishment
	Progressively construct and rehabilitate the outer face of the SAR Waste Rock Emplacement in a series of lifts.	Throughout Project operations
	Maintain existing and establish additional vegetation screens.	During site establishment and ongoing
	Construct built infrastructure using non-reflective, neutral coloured materials or outer coatings.	During site establishment
	Ensure to the extent practicable that lights with diffusing covers or with visible bare lamps that emit light above the horizontal plane are not be used on the outside of buildings or structures.	Ongoing

Table A2.2 (Cont'd)
Updated Proposed Operational Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Visibility (Cont'd)		
Operational Measures	Limit to the extent practicable, operation of mobile plant on the outer faces of the SAR Amenity Bund and SAR Waste Rock Emplacement to daylight hours.	Throughout Project operations
	Manage dust emissions and blasting to limit the potential for dust clouds or blast fume to be visible from outside active sections of the Project Site.	Throughout Project operations
	Ensure, to the extent practicable, that the light from all mobile lighting towers is directed away from surrounding residences and public roads.	Throughout Project operations
	Construct the SAR WRE access ramp in consideration of the direction and intensity of lighting from Project-related vehicles on users of the Newell Highway.	Throughout Project operations
	Turn off external lighting in non-operational or non-active sections of the Project Site.	Throughout Project operations
	Consider any reasonable request by a potentially affected resident for assistance to create a visual screen between a residence and the SAR Mine Site.	Throughout Project operations
Noise and Blasting		
Infrastructure and Design	**Noise**	
	Construct the SAR Amenity Bund	During site establishment
	Progressively construct and rehabilitate the outer face of the SAR Waste Rock Emplacement in a series of lifts.	Throughout Project operations
	Construct a bund adjacent to the proposed Haul Road or operate the Haul Road at least 6m below the natural ground surface between the southern boundary the Caloma Waste Rock Emplacement and the Newell Highway underpass.	If required once Caloma Waste Rock Emplacement has reached surface
	Consult with the owners of Residences R6, R26, R40 and R43 in relation to the predicted operational noise levels and, if requested to do so, enter into a suitable agreement to undertake mitigation works in a manner similar to the existing mitigation at residences within Tomingley village.	Prior to site establishment and ongoing
	Blasting	
	Construct all blasting-sensitive infrastructure, including public roads, powerlines and Project-related buildings outside of the identified Blast Management Zone.	During site establishment
	Construct or utilise existing fences and install warning signs surrounding the active mining areas to prevent inadvertent or unauthorised access to the Blast Management Zone.	Prior to Project operations

Table A2.2 (Cont'd)
Updated Proposed Operational Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Noise and Blasting (Cont'd)		
Operational measures	**Noise**	
	Install broadband reversing alarms on all mobile earthmoving equipment.	Throughout site establishment and Project operations
	Undertake land preparation operations, including vegetation clearing and soil stripping, during the daytime only.	During site establishment
	Preferentially operate noisy equipment during the evening and night as close as possible to the acoustic bunds and SAR Haul Road and in the deepest sections of the open cuts.	Throughout Project operations
	Ensure that noisy equipment is operated in exposed locations during the daytime and preferentially when the wind is blowing from the closest receptors towards the operational area.	Throughout Project operations
	Blasting	
	Ensure that all surface blasts are designed and supervised by a suitably qualified and experienced blasting engineer or shotfirer to comply with the relevant blasting criteria at surrounding residences and infrastructure.	Throughout Project operations
	Establish and maintain the Blast Management Zone and ensure that only authorised personnel are permitted within that zone during blasting operations.	During blasting operations
	Store all explosives within a licenced Magazine in accordance with the relevant guidelines, regulatory requirements and licence conditions.	Throughout Project operations
	Implement best blast practice methodology to minimise fly-rock and fumes.	Throughout Project operations
Monitoring	**Noise**	
	Install two additional real time noise monitoring terminals Throughout Project operations.	Prior to site establishment
	Continue to undertake attended noise monitoring at selected locations surrounding the Project Site.	Throughout site establishment and Project operations
	Blasting	
	Monitor meteorological conditions prior to blast events and, where required, postpone blasting until more favourable meteorological conditions occur.	Prior to blasting operations
	Install permanent blast monitors at selected residences and monitor all blasts.	Prior to and during blasting operations
	Install temporary blast monitors at selected residences or locations where a substantiated complaint has been made or as otherwise required.	As required

Table A2.2 (Cont'd)
Updated Proposed Operational Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Noise and Blasting (Cont'd)		
Community Consultation	Initiate regular discussions with potentially affected residents to identify if any concerns exist.	Throughout site establishment and Project operations
	Promptly respond to any issue of concern.	Throughout site establishment and Project operations
	Refine on-site noise mitigation measures and operating procedures, where practicable, in response to noise exceedances or substantiated community complaint	As required
Management Plans	Prepare and implement an updated *Noise Management Plan* and *Blasting Management Plan*	Prior to site establishment
Air Quality and Greenhouse Gas		
Infrastructure and Design	Sheet roads, particularly the Haul Road and Services Road, with low silt, durable materials to limit generation of silt-sized particles.	Throughout site establishment and Project operations
	Operate largest class of vehicle practicable to transport waste rock from the SAR Open Cut to the Caloma Waste Rock Emplacement.	Throughout Project operations
	Schedule transportation of waste rock from the SAR Open Cut to the Caloma Waste Rock Emplacement over the initial two to three years of mining.	Throughout Project operations
	Seal the initial 50m of Back Tomingley West Road and McNivens Lane from the edge of the Newell Highway and the SAR Access Road from the edge of Kyalite Road to limit tracking of mud and sediment onto the public road network.	During site establishment
	Continue to assess the feasibility of installing a solar power generation facility adjacent to the TGO Mine Site.	Ongoing
Operational Measures	Disturb only the minimum area necessary for mining operations.	Throughout site establishment and Project operations
	Undertake progressive rehabilitation of areas no longer required for mining operations as soon as practicable.	Throughout site establishment and Project operations
	Avoid material movement operations on elevated sections of the Project Site during periods of high wind.	Throughout Project operations
	Clearly mark all haul roads and other roads and tracks and ensure that signposted speed limits are complied with.	Throughout site establishment and Project operations
	Avoid blasting operations or other activities likely to generate significant dust emissions during periods of strong southerly wind, where practicable.	During blasting operations
	Ensure adequate stemming is used.	During blasting operations
	Minimise dust emissions from the existing crushing and screening operations to the extent practicable.	Throughout Project operations
	Use of water sprays/sprinklers or water carts on internal, unsealed roads and in other areas to minimise dust emissions, as required.	Throughout Project operations

Table A2.2 (Cont'd)
Updated Proposed Operational Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Air Quality and Greenhouse Gas (Cont'd)		
Operational Measures (Cont'd)	Minimise drop heights during loading and unloading of waste rock and ore and avoid tipping material down a tip face.	Throughout Project operations
	Apply water to stockpiles prior to loading, transportation and unloading to limit dust emissions, as required.	Throughout site establishment and Project operations
	Review and implement energy efficiency measures where reasonable and practicable.	Throughout Project operations
	Maintain plant and equipment to maximise efficiency and reduce emissions.	Throughout Project operations
	Source locally produced goods and services to reduce transport fuel emissions.	Throughout Project operations
Monitoring and Management Plans	Monitor meteorological conditions (including via automated alerts) to identify periods of adverse weather and implement appropriate additional mitigation measures.	Throughout site establishment and Project operations
	Undertake visual monitoring and mandatory reporting of visible dust emissions to site supervisors and implement measures to minimise or reduce observed dust emissions.	Throughout site establishment and Project operations
	Monitor real-time dust emissions (including via automated alerts) using the existing TEOM and proposed PM_{10} dust monitors and implement measures to minimise or reduce observed dust emissions when predefined triggers are exceeded.	Throughout site establishment and Project operations
	Prepare and implement an updated *Air Quality and Greenhouse Gas Management Plan*.	Prior to site establishment
Surface Water		
Infrastructure and Design	Construct the proposed SAR Open Cut and SAR Administration Area Clean Water Diversions with a minimum freeboard of 0.5m above the anticipated 0.1% AEP flood level.	During site establishment
	Construct dirty water diversion structures, sediment basins and the SAR Water Storage Dam.	During site establishment
	Establish pump and pipe infrastructure between the proposed sediment basins and the SAR Water Storage Dam.	During site establishment
	Establish pump and pipe infrastructure between the SAR Water Storage Dam and the TGO Mine Site.	During site establishment
	Construct culverts under all public roads and the proposed Haul Road and Services Road.	During site establishment

Table A2.2 (Cont'd)
Updated Proposed Operational Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Surface Water (Cont'd)		
Operational Measures	Install all erosion and sediment control structures prior to undertaking substantial surface disturbing activities.	During site establishment
	Ensure that dirty, mine or process water is separated and retained within the Project Site for use for mining-related purposes.	Throughout Project operations
	Ensure that all clean water from upslope of the Project Site is conveyed around disturbed sections of the Project Site at non-erosive velocities and is discharged to the downstream environment.	Throughout Project operations
	Inspect and maintain all surface water management infrastructure to ensure it continues to operate as designed and maintain surface water storages to ensure adequate capacity is maintained to capture and store surface water within the Project Site.	Regularly and as required after significant rainfall events
	Rehabilitate all disturbed areas as soon as practicable once no longer required for mining-related purposes.	Throughout site establishment and Project operations
	Store hydrocarbons, reagents and chemicals in accordance with the relevant Australian Standard or manufactured instructions.	Throughout site establishment and Project operations
	Undertake refuelling and maintenance activities in designated sections of the Project Site with spill capture and management infrastructure and protocols.	Throughout site establishment and Project operations
	Securely store and regularly remove all waste oil and contaminated waste from the Project Site.	Throughout site establishment and Project operations
	Ensure that the proposed pastefill plant is bunded to prevent discharge of low pH water.	Throughout Project operations
	Ensure that water use within the Project Site is managed in accordance with the water balance presented in Section 3.9.4 or subsequent versions included within the Water Management Plan.	Throughout Project operations
Monitoring and Management Plans	Monitor surface water flows and quality at a range of locations upslope, within and downslope of the Project Site.	Prior to and throughout site establishment and Project operations
	Prepare and implement an updated *Surface Water Management Plan*	Prior to site establishment
Groundwater		
Infrastructure and Design	Backfill the Caloma 1 and 2 Open Cuts and SAR Open Cut South and Central Pits.	Throughout Project operations
	Construct the Residue Storage Facilities and all water storages that would store process or mine water in a manner that would minimise the potential for seepage of contaminated water into the groundwater system.	During site establishment

Table A2.2 (Cont'd)
Updated Proposed Operational Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Groundwater (Cont'd)		
Operational Measures	Construct paired monitoring bores in the vicinity of Gundong and Bulldog Creeks to demonstrate separation of the shallow alluvial aquifer and the deeper fractured rock aquifer.	Prior to site establishment
	Obtain water access licenses for a minimum annual extraction rate of 427ML from the Lachlan Fold Belt Murray Darling Basin (MDB) Groundwater Source of the Water Sharing Plan for the *NSW MDB Fractured Rock Groundwater Sources 2020* .	Prior to Project operations
	Undertake remodelling of the anticipated groundwater inflows to the TGO and SAR workings, taking into consideration groundwater monitoring results collected in the intervening period.	Prior to 31 December 2024
	Ensure that additional water access licences are obtained in light of the results of the proposed groundwater remodelling	Post groundwater remodelling and no later than 31 December 2025
	Ensure that where groundwater is not permitted to flow to natural land surface or surface drainages.	Throughout Project operations
Monitoring and Management Plans	Prepare and implement a revised *Groundwater Management Plan*.	Prior to site establishment
Land and Soil Capability		
Operational Measures	**Soil Stripping**	
	Delineate the areas to be stripped using suitable ground markers.	Throughout soil stripping operations
	Strip soil materials in accordance with the identified stripping depths and ensure soils of different classes are not mixed.	Throughout soil stripping operations
	Locate machinery circuits to minimise compaction of both undisturbed and stockpiled soil.	Throughout soil stripping operations
	Apply water where required to soils prior to and during stripping to maintain a 'slightly moist' condition.	Throughout soil stripping operations
	Minimise the handling and rehandling of salvaged soil as far as practicable.	Prior to and throughout site establishment and Project operations
	Soil Stockpiling	
	Directly place stripped soil onto areas undergoing rehabilitation where practicable.	Throughout soil stripping operations
	Stockpile soils of different classes separately.	Throughout soil stockpiling operations

Table A2.2 (Cont'd)
Updated Proposed Operational Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Land and Soil Capability (Cont'd)		
Operational Measures (Cont'd)	Construct soil stockpiles with a maximum side slope of 1:3 (V:H).	Throughout soil stockpiling operations
	Construct soil stockpiles with a maximum height of 4m.	Throughout soil stockpiling operations
	Retain a 'rough' surface profile for soil stockpiles to promote water infiltration rather than runoff.	Throughout soil stockpiling operations
	Seed soil stockpiles with appropriate groundcover species, where practicable.	Throughout soil stockpiling operations
	Maintain all erosion and sediment control infrastructure in the vicinity of soil stockpiles throughout the life of the Project.	Throughout Project operations
	Monitor the condition of soil stockpiles throughout the life of the Project, including the presence of avoidable soil erosion or degradation.	Annually during Project operations
	Minimise rehandling of soil as far as practicable, unless it is required to address loss of soil stockpile integrity.	Throughout Project operations
	Soil Respreading	
	Place subsoil and topsoil in the locations and to the depths identified.	Throughout rehabilitation operations
	Test stockpiled soils prior to use to determine soil properties and identify required ameliorants including fertilizer treatments.	Prior to rehabilitation operations
	Monitor for adverse meteorological conditions prior to and during soil handing operations and do not commence or continue works until favourable conditions are present.	Throughout rehabilitation operations
	Reshape and rip, where practicable, all land surfaces prior to the placement of soil.	Prior to rehabilitation operations
	Apply any required ameliorants during soil spreading operations.	Prior to and during rehabilitation operations
	Plan and manage vehicle movements to reduce the compaction of soils as far as practicable.	Throughout rehabilitation operations
	Ensure soils and surfaces have adequate moisture content during respreading operations to minimise loss of soil and other dust related impacts.	Prior to and during rehabilitation operations
	Lightly scarify upper surface of topsoils to encourage rainfall infiltration.	During rehabilitation operations
	Stabilise final landform with appropriate pasture or other species as soon as practicable after respreading operations.	Following soil placement

Table A2.2 (Cont'd)
Updated Proposed Operational Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Agriculture		
Monitoring and Management Plans	**Weed, Pest and Disease Management**	
	Manage weeds, pests and diseases in accordance with the *Mining Operations Plan* and *Biodiversity Management Plan.*	Throughout Project operations
	Agricultural Productivity	
	Include as part of a *Rehabilitation Management Plan* detailed rehabilitation completion criteria for agricultural productivity of rehabilitated lands.	Throughout Project operations
Biodiversity		
Infrastructure and Design	Consider potential resource sterilisation as part of any potential Stewardship Sites in accordance with the Biodiversity Offset Scheme.	Prior to site establishment or as required
Operational Measures	Ensure all workers are inducted in relation to Project environmental procedures, including environmental risk and emergency management.	Throughout site establishment and Project operations
	Survey and mark out the limits of approved native vegetation clearing and areas of native biodiversity to be retained and ensure that surface disturbing activities are limited to approved areas.	Throughout site establishment
	Construct temporary fencing around significant areas of native biodiversity during construction operations.	Throughout site establishment
	Avoid clearing native vegetation and hollow-bearing trees during the breeding season of hollow-dwelling fauna	Throughout site establishment
	Undertake pre-clearing inspections of hollow-bearing trees to confirm the absence of roosting/breeding threatened species and manage any vertebrate fauna identified during inspections to minimise the risk of mortality or injury.	Throughout site establishment
	Salvage, where practicable, suitable habitat features (e.g., tree hollows, large woody material, etc) located within areas to be disturbed.	Throughout site establishment
	Relocate all salvaged habitat features as soon as reasonably practicable to surrounding areas of increased biodiversity value that would not be impacted by the Project.	Throughout site establishment
	Undertake vegetation clearance and any mulching in accordance with best practice principles, including staged vegetation clearance where practicable.	Throughout site establishment
	Respond to native fauna detected during vegetation clearing operations in accordance with the Fauna Handling and Rescue Procedure outlined in the *TGO Biodiversity Management Plan.*	Throughout site establishment
	Ensure machinery entering the Project Site has been adequately cleaned and inspected for foreign plant material including seeds prior to operating on site.	Throughout site establishment
	Control weed species within the Project Site	Throughout site establishment and Project operations
	Install warning signs at known wildlife crossing locations and adhere to speed limits to reduce the risk of vehicle strike to native fauna.	Throughout site establishment and Project operations

Table A2.2 (Cont'd)
Updated Proposed Operational Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Biodiversity (Cont'd)		
Operational Measures (Cont'd)	Continue to source seed or other propagation material from local populations as far as practicable to maintain genetic integrity of the local plant populations.	Throughout site establishment and Project operations
	Engage and inform the local community on the importance of Fuzzy Box Woodland TEC as part of ongoing stakeholder engagement sessions, newsletters and/or other community engagement activities.	Throughout site establishment and Project operations
Monitoring and Management Plans	Prepare and implement a Biodiversity Management Plan	Prior to site establishment
Aboriginal Heritage		
Operational Measures	Ensure that areas outside the proposed Limit of Disturbance are not subject to Project-related disturbance.	Throughout site establishment and Project operations
	Ensure that all identified Aboriginal objects and sites are recorded in the Mine's spatial database.	Throughout site establishment and Project operations
Management Plans and Protocols	Prepare and implement an *Aboriginal Cultural Heritage Management Plan*	Prior to site establishment
	Implement the following management strategies identified for each site as listed in Table 6.11.8. Group 1 – Sites to be mapped, described and collected • Flag all visible surface artefacts at a site in the field. • Photograph the site after flagging and before recording. • Record key artefact information for all artefacts. • Photograph a selection of indicative and / or unusual artefacts from each site. • Collect the artefacts once all recording is complete according to site with artefacts from each site being kept separate. • Incorporate data recorded in a report. • Submit an Aboriginal Site Impact Recording Form (ASIRF) detailing the salvage process and results of the sites. Group 2 – Scarred trees to be relocated • Photograph the scarred section of the tree prior to removal. • Follow the advice of a suitably qualified arborist during the removal of the scarred section of each tree. • Place the scarred portion of the trees in a place of safe-keeping, and with the agreement of the RAPs, potentially place the salvaged portions on display to allow continued interpretation.	Prior to site establishment

Table A2.2 (Cont'd)
Updated Proposed Operational Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Aboriginal Heritage (Cont'd)		
Management Plans and Protocols (Cont'd)	Group 3 – Sites to be fenced to prevent inadvertent disturbance. • Erect a high-visibility fence around each site or group of sites, including a 5m buffer. • Maintain fencing for the duration of site construction operations at a minimum. • Ensure fenced areas are managed as no-go areas.	
	Implement an unanticipated finds protocol in the event that a previously unknown Aboriginal site is identified within the proposed areas of disturbance.	Throughout site establishment and Project operations
Historic Heritage		
Operational Measures	Ensure that areas outside the proposed Limit of Disturbance are not subject to Project-related disturbance.	Throughout site establishment and Project operations
	Ensure that all identified historic heritage sites are recorded in the Mine's spatial database.	Throughout site establishment and Project operations
	Undertake a test excavation program under the supervision of a qualified Archaeologist within selected sections of the footprint of the realigned Newell Highway in the vicinity of the former McPhail village.	Prior to site establishment
	Undertake photographic archival recording of the "Rosewood" Homestead prior to disturbance.	Prior to site establishment
Management Plans and Protocols	Prepare and implement a *Historic Heritage Management Plan*.	Prior to site establishment
	Implement an Unanticipated Finds Protocol in the event that a historic artefact is identified	Throughout site establishment and Project operations
Hazards and Risks		
Infrastructure and Design	**Explosives**	
	Ensure that the SAR Magazine complies with all relevant engineering and safety standards.	Throughout Project operations
	Ensure that the SAR Magazines has a perimeter security fence and gate with access restricted to authorised personnel.	Throughout Project operations
	Bushfire	
	Establish and maintain an Asset Protection Zone of at least 50m around the buildings of the SAR Administration Area.	Throughout Project operations
Operational Measures	**Explosives**	
	Ensure that all authorised employees managing explosives would have a Security Clearance.	Throughout Project operations
	Bushfire	
	Maintain all roads and tracks within the Project Site to ensure safe access and egress in the event evacuation is required.	Throughout Project operations
	Ensure training is provided to site personnel in relation to specific firefighting tasks and procedures.	Throughout Project operations

Table A2.2 (Cont'd)
Updated Proposed Operational Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Hazards and Risks (Cont'd)		
Operational Measures (Cont'd)	Store all hydrocarbons, waste oils and explosives in accordance with relevant guidelines.	Throughout Project operations
	Facilitate access to the Project Site for Rural Fire Service equipment and personnel, including access to standpipes and water filling points, in the event of a fire emergency.	Throughout Project operations
	Fully comply with the requirements of Rural Fire Service and other emergency services in the event of a fire emergency.	Throughout Project operations
	Consult regularly with the Rural Fire Service.	Throughout Project operations
	Monitor and reduce fuel loads within the Asset Protection Zone as required.	Throughout Project operations
	Undertake monitoring and reduction of fuel loads within the Project Site in accordance with existing programs.	Throughout Project operations
Monitoring and Management Plans	**Bushfire**	
	Develop site-specific Emergency and Evacuation Management Procedures.	Prior to site establishment
Economic Impacts		
Operational Measures	Extend the existing Planning Agreement with Narromine Shire Council for the life of the Project.	Prior to determination of the application for development consent
	Continue to implement the current local employment and procurement process that: • give preference when engaging new employees to candidates who live within the Narromine, Parkes and Dubbo LGAs; • give preference to suppliers of equipment, services or consumables located within the Narromine, Parkes and Dubbo LGAs; • encourage and support participation of potential locally-based employees and contractors in appropriate training or education programs to build capacity within the surrounding areas; and • encourage and support participation of Aboriginal people and organisations in Project-related employment and supply services.	Throughout site establishment and Project operations
Social		
Infrastructure and Design	Construct the SAR Amenity Bund and outer face of the SAR Waste Rock Emplacement to obscure views of active sections of the Project Site.	Throughout site establishment and Project operations
	Construct the realigned Kyalite Road as close as possible to the existing alignment, including an overpass over the Haul Road and Services Road.	During site establishment
	Construct the SAR Waste Rock Emplacement using geomorphic design principles.	Throughout Project operations

Table A2.2 (Cont'd)
Updated Proposed Operational Environmental Management and Monitoring Measures

Management Strategy	Measure	Timing
Social (Cont'd)		
Infrastructure and Design (Cont'd)	Construct the Back Tomingley West Road, Kyalite Road and McNivens Lane intersections with the realigned Newell Highway with channelised turning lanes.	During site establishment
Operational measures	Continue to preferentially engage local employees and/or suppliers, where available.	Throughout site establishment and Project operations
	Continue to provide support to local and Regional community groups, organisations and individuals to undertake community-based activities that support and benefit the Local and Regional communities.	Throughout site establishment and Project operations
Consultation, Agreements and Management Plans	Develop and implement a *Community Engagement Plan* for the Project	Prior to site establishment
	Negotiate commercial agreements with key affected landholders for the leasing of key dwellings for the life of the Project.	Prior to site establishment or as required
	Continue ongoing open and transparent consultation via regular Community Consultative Committee meetings, consultation with individual landholders and community information sessions.	Throughout site establishment and Project operations
	Establish and build upon existing frameworks to monitor and report on social impacts.	Throughout site establishment and Project operations
	Liaise with surrounding local Councils in regard to housing pressures and availability.	As required
	Extend the existing Planning Agreement with Narromine Shire Council for the life of the Project.	Prior to determination of the application for development consent
	Support the preparation of a long-term development plan for Tomingley village, to ensure that the village continues to thrive following the completion of mining operations.	As required

This page has intentionally been left blank

Appendix 3

Technical Response to EPA Submission

prepared by

Muller Acoustic Consulting Pty Ltd

(Total No. of pages including blank pages = 30)

This page has intentionally been left blank

PO Box 678
Kotara NSW 2289
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com

22 April 2022

MAC201136-03LR1

Attention: Michael Fake
RW Corkery & Co Pty Limited
62 Hill Street
ORANGE NSW 2800

Dear Michael,

Tomingley Gold Extension Project – Response to EPA Submission

1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has reviewed the comments provided by the NSW Environment Protection Authority (EPA) following the submission of the Noise and Blasting Impact Assessment (NBIA) that accompanied the Environmental Impact Statement (EIS) for the Tomingley Gold Extension Project (TGEP) (the 'Project').

The NBIA was completed to quantify potential noise and vibration impacts associated with the Project construction, operation and road traffic noise on the surrounding community.

The EPA has reviewed the EIS for the Project and has provided comments requiring additional information and clarifications to address the potential for noise impacts.

Responses are provided for each comment in the following.

2 Noise Emission Modelling

2.1 EPA Comment 1

Section 6 of the Noise and Blasting Impact Assessment (NBIA) states that noise emissions were modelled using DGMR iNoise software, and that the calculation method used was in accordance with ISO9613:1 and ISO9613:2 including corrections for meteorological conditions using CONCAWE. It is unclear what CONCAWE parameters were used in the modelling. Also attached is correspondence between the iNoise/Predictor manufacturer and the EPA, for your information.

2.1.1 Response 1 – CONCAWE Parameters Used

The NBIA described that a detailed analysis of the significance of noise enhancing conditions was not undertaken and NPI noise enhancing meteorological conditions were adopted in the noise modelling as presented in Table 31 of the NBIA and are reproduced in **Table 1**.

Table 1 Modelled Meteorological Parameters

Assessment Condition[1]	Temperature	Wind Speed[2]/ Direction	Relative Humidity	Stability Class[2]
Day	20°C	3m/s all directions	50%	D
Evening	10°C	3m/s all directions	50%	D
Night	10°C	2m/s all directions	50%	F

Note 1: Day 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening 6pm to 10pm; Night - the remaining periods.

Note 2: Implemented using CONCAWE methodology.

The values presented in **Table 1** were used to simulate the meteorological effects in the iNoise software for predictions of noise emissions from the project.

2.2 EPA Comment 2

For noise levels predicted under noise enhancing conditions, the NPfI states, inter alia, that noise levels should be predicted under a 3m/s source to receiver wind. Clause 5 of ISO9613-2 Attenuation of sound propagation outdoors – General method of calculation specifies noise levels are calculated according to average downwind conditions, which are defined as:

- *wind direction within an angle of + 45" of the direction connecting the centre of the dominant sound source and the centre of the specified receiver region, with the wind blowing from source to receiver, and*
- *wind speed between approximately 1 m/s and 5 m/s, measured at a height of 3 m to 11 m above the ground.*

Therefore, use of ISO9613-2 to predict noise enhancing conditions could be consistent with the conditions required in the Noise Policy for Industry (NPfI). ISO9613-2 also includes the ability to modify the predicted downwind noise level based on long term meteorological variances. It does this using the Cmet correction (defined in Clause 8) that can be added to an ISO9613-2 calculated noise level to account for long term variances in meteorological conditions that are favourable and unfavourable to noise propagation. The calculation of Cmet relies on an arbitrary factor C0 in its calculation and there is no provision in the Standard to calculate Cmet based on specific individual meteorological conditions, like those required by the NPfI. According to Notes 20-22 in Clause 8, Cmet corrections generally only maintain or reduce the predicted downwind noise levels.

The manufacturer of iNoise and Predictor, the software program used to predict noise for the proposal, has confirmed that you are able to specify replacement of Cmet in ISO9613-2 with the meteorological correction from another noise prediction method called CONCAWE. This CONCAWE meteorological correction is called K4 and calculates the noise level enhancement based on a number of specific meteorological factors including wind speed, direction, and stability class.

If Cmet is set to zero, or is not used, then the resulting noise levels are representative of the default downwind ISO9613-2 conditions, defined above. If Cmet is replaced by K4, and K4 is set to represent 3m/s downwind conditions, the resulting noise level will then have two corrections for downwind; one from ISO9613-2 which is downwind by default, and another from K4. This means that the model will likely overestimate the enhancing effect of downwind conditions.

2.2.1 Response 2 - ISO9613 Downwind Effect & CONCAWE Meteorology

Based on ISO 9613 - 1/2, iNoise calculates the noise level as follows:

$$L_{lt} = L_{dw} - C_{met} - C_t \quad (1)$$

$$L_{dw} = L_W + D_c - A \quad (2)$$

L_{lt}	Long-term average octave (or 1/3-octave) SPL in dB
L_{dw}	Equivalent continuous downwind octave (or 1/3-octave) SPL in dB
C_{met}	Meteorological correction in dB
C_t,	Correction for the active time of the source in dB
L_W	Sound power level in dB(A) per octave (or 1/3-octave), re 1 pW
D_c	Directivity correction in dB
A	Attenuation (octave-band) in dB per octave (or 1/3-octave)

The attenuation A is calculated as follows:

$A = A_{div} + A_{atm} + A_{gr} + A_{bar} + A_{fol} + A_{site} + A_{hous}$ (3)

A_{div} Geometrical divergence in dB

A_{atm} Atmospheric absorption in dB/octave (or 1/3-octave)

A_{gr} terrain effect in dB/octave (or 1/3-octave)

A_{bar} Screening in dB/octave (or 1/3-octave)

A_{fol} Attenuation due to foliage in dB/octave (or 1/3-octave)

A_{site} Attenuation due to installations on an industrial site in dB/octave (or 1/3-octave)

A_{hous} Attenuation due to housing in dB

When C_{met} is set to zero, or is not used, the resulting noise levels are representative of the default downwind ISO9613-2 conditions as per Equation (1) above. When CONCAWE is used, C_{met} is replaced by K4 to represent the effects of wind and/ or stability class. For clarity, C_{met} is replaced by K4, not in addition to C_{met} and the resulting noise level has only one correction for wind effects – ie CONCAWE as shown in Equation (4). Note that L_{dw} is unchanged.

$$L_{lt} = L_{dw} - K4 - C_t \quad (4)$$

To confirm this, calculations using the project FY25 scenario "Base Case" using ISO9613 with 'No Met" were compared with calculations of the effects of stability class and winds when substituting CONCAWE meteorological effects. The results of the calculations are presented in **Attachment A.** The following scenarios were calculated for comparison to the Base Case:

Scenario 1 - D Class Stability using CONCAWE for all periods;

Scenario 2 - Winds Effect using CONCAWE for 1m/s, 2m/s and 3m/s in all directions; and

Scenario 3 - NPI Noise Enhancing Conditions using CONCAWE –Stability Class D + 3m/s wind in all directions and Stability Class F + 2m/s wind in all directions.

Comparison of the Base Case and Scenario 1 shows that the downwind effect of ISO 9613 is evident as the calculated noise levels are the same (within 0.5dB) as that for D Class Stability. This allows for comparison of Scenario 2 - the influence of winds and Scenario 3 - NPI Noise Enhancing Conditions to Scenario 1.

The difference in calculated noise levels between the Base Case and Scenario 2 show increases for the application of higher wind speeds. Comparison of Scenario 3 representing NPI Noise Enhancing Conditions demonstrate that a cumulative effect of C_{met} and K4 (double positive correction) is not being applied.

2.3 EPA Comment 3

While the EPA considers the approach used is likely conservative, we are also cognisant that license limits above NPfI PNTLs are being sought for the proposal, which will likely be derived from predicted noise levels. The EPA must be satisfied that proposed noise levels, which may be adopted as statutory requirements in an environment protection licence (or similar) are appropriate and best achievable. While the EPA does not generically mandate the noise models and specific inputs to be used on projects, EPA will assess the appropriateness of the model used in the context of the individual circumstances.

Therefore, before further consideration of the suitability of the use of ISO9613-2 + K4 to calculate noise enhancing conditions for these projects (i.e. a 3m/s source to receiver wind), the EPA requires evidence that the approach is not effectively applying a double positive correction for the NPfI noise enhancing meteorological conditions i.e. that the approach is not overly conservative in this situation. The EPA acknowledges that there are a number of different noise prediction methods available and the proponent should use an appropriately justified method of calculating noise levels under noise enhancing conditions.

2.3.1 Response 3 - Licence Noise Limits

Predicted noise levels exceed the PNTL by up to 2dB during FY24 at five (5) non project related receivers (ie those receivers that are not project owned or with a MOU in place) R06, R26, R40, R43 and R45 (unoccupied)and are detailed as follows:

- five (5) exceedances are expected to occur during the evening period;
  - three (3) receivers (R06, R40, R45) exceed by <1dB,
  - two (2) receivers (R26, R43) exceed by <2dB; and
- two (2) receivers (R26, R43) exceed by <1dB during the night time period.

Predicted noise levels exceed the PNTL by up to 1dB during FY25 at two (2) non project related receivers (ie those receivers that are not project owned or with a MOU in place), R26 and R40 and are detailed as follows:

- two (2) receivers (R26, R40) exceed by <1dB during the evening period; and
- one (1) receivers (R26) exceed by <1dB during the night period

A detailed summary of predicted noise levels and exceedances is presented in **Attachment B**.

Furthermore, in consideration of the preceding response regarding over conservative predictions (**Section 2.2.1**), calculated noise levels are not considered to be over conservative and are representative of the potential noise emission from the project. Notwithstanding, actual noise emissions from the project are likely to be slightly lower than predicted as the (time) utilisation of most equipment used in the model was 100%. Additionally, the noise management system will detect exceedances (if they occur), allowing for immediate corrective actions to be implemented – this is particularly relevant during noise enhancing meteorological conditions.

TGO's initial consent and EPL limits were 37dBA whilst the mine was as an open cut operation and at the cessation of open cut mining the EPL limits were reduced to 35dBA. Considering the quantity and extent of predicted exceedances (ie <2dB), the implementation of noise limits within 2dB of the PNTL that reflect the potential residual noise impacts for the first two years of the project would be appropriate in accordance with NPI methodology and in context of the project setting and history. In addition, the proponent will seek out additional MOU with those potentially affected receivers as has been done historically.

2.4 EPA Comment 4

As the proposal involves the extension of existing approved operations, the noise model should be validated/calibrated through the use of noise measurements of existing operations under known meteorological conditions and at locations free of extraneous noise, to provide confidence in the accuracy of the modelling.

Information Required

The Proponent must ensure the Noise Model has been validated/calibrated through the use of noise measurements of existing operations under known meteorological conditions and at locations free of extraneous noise, to provide confidence in the accuracy of the modelling.

2.4.1 Response 4 - Calibrated Noise Model

MAC have undertaken monthly attended noise monitoring for TGO since 2016 and have completed the Modification 4 and Modification 5 noise assessments for the TGO utilising a calibrated noise model of the operation.

Predicted noise levels at the nearest receivers (R2, R6 and R23) for TGO operations are provided in **Table 2** with the observed noise contributions from operator attended noise monitoring through the period April 2018 to August 2018. Generally, contributed noise measurements and predicted noise levels are within 3dB and indicate a reasonable level of correlation.

Table 2 Predicted Noise Levels v Measured													
Rec	Predicted TGO Contribution		Apr-18		May-18		Jun-18		Jul-18		Aug-18		Average TGO Contribution
R2	30	Stability	D	E	E	F	D	E					
		TGO	25	26	35	30	31	30	inaudible		inaudible	inaudible	31
R6	30	Stability	D	D			F	E					
		TGO	31	34	inaudible	inaudible	33	30	inaudible		inaudible	inaudible	33
R23	32	Stability			E	F			E	F	G	F	
		TGO	inaudible	inaudible	36	35	inaudible	inaudible	34	36	35	34	35

3 Assessment of Low Frequency Noise

3.1 EPA Comment 1

Section 7.1.2 of the NBIA assesses the potential for low frequency noise from the proposal, however puts forward alternative criteria to those in Noise Policy for Industry (NPfI) Fact Sheet C. The Noise Policy for Industry (NPfI) requires low frequency noise (LFN) to be assessed against the requirements of Fact Sheet C. Where LFN is or is likely to occur, and cannot be mitigated to below NPfI LFN triggers, the NPfI requires a modifying factor correction to be applied to the measured or predicted noise levels at the noise-sensitive receiver locations before comparison with the project noise trigger levels. Fact Sheet C has two requirements to determine the presence of LFN:

a) *a 'screening' test to identify the potential for LFN by assessing whether there is a difference of 15 dB or more between C- and A-weighted measurements; and where this is the case,*

b) *a detailed evaluation of the 1/3 octave frequencies between 10Hz to 160Hz in Table C2 of Fact Sheet C.*

The EPA (or other regulatory authorities) will consider the outcome of a noise assessment undertaken in accordance with the NPfI, including any modifying factor arising from the presence of LFN, when recommending noise limits in an environment protection licence or other approval. The EPA acknowledges that there are practical constraints to assessing low frequency noise when using standard assessment approaches including:

limited availability of published sound power level data below 63Hz for plant and equipment that may generate LFN; and

limitations in the ability of commercial noise modelling software to predict noise levels below 31.5Hz (and in some instances below 63Hz).

The following outlines how low frequency noise can be assessed in different circumstances to satisfy the requirements of Fact Sheet C of the NPfI. Alternative methods may be used where this is supported by sufficient evidence to demonstrate that LFN has been considered in accordance with the requirements set out in Fact Sheet C of the NPfI.

Determining LFN modifying factor corrections for existing developments

- *Measure source contributions in the one-third octave band range of 10Hz to 160Hz at the existing development.*
- *Document the measurement methodology including: the prevailing meteorological conditions; the operating conditions of the existing development during measurements; the location of the measurements; and any adjustments applied to the measurements to assess LFN in accordance with Fact Sheet C of the NPfI.*

Determining LFN modifying factor for a new development

- *Predict the one-third octave band noise levels using proprietary noise modelling software down to the lowest one-third octave band that can be predicted by the noise model. The noise model used, the lowest one-third octave band noise level that can be predicted by that noise model, and the sound power level data used should be reported.*
- *Supplement the modelling results with measurements from comparable sources of noise to the proposed new development.*
- *Using this measurement data, develop a low frequency curve (or a "tail") in the one-third octave band frequency between the lowest one-third octave band noise levels that can be predicted by the modelling software and down to 10Hz.*
- *Apply an adjustment to the measured frequency curve based on the difference between the predicted and measured noise level at the lowest one-third octave band noise levels that can be predicted by the modelling software. For example, if the lowest one-third octave band frequency that can be modelled is 63Hz, then the data measured below 63Hz should be adjusted in each one-third octave band between 10Hz to 63Hz based on the difference between the predicted and the measured one-third octave band noise levels at 63Hz.*
- *Once the frequency curve down to 10Hz has been established, this should be used to assess LFN in accordance with Fact Sheet C of the NPfI.*

Note that all measurements should be undertaken using a Class 1 sound level meter conforming to AS IEC 61672.1-2013 with appropriate wind screen protection over the microphone (Refer NPfI, Fact Sheet C); and at measurement location(s) where LFN can be measured in the absence of extraneous noise to accurately capture LFN.

3.1.1 Response 1 – Low Frequency Noise Assessment for a New Development

Scenario 2 FY24 has been used to determine the potential for LFN emissions as it is the scenario with the highest number of exceedances and of greatest magnitude.

Table 3 presents historic ambient noise levels measured at Receiver R23 in the Tomingley township on 27 October 2018 for the frequency range 10Hz to 160Hz to determine the difference to the 25Hz band for frequencies 20Hz and below representing the low frequency 'tail'. Additionally, the determination of the low frequency 'tail' was determined for the overall ambient noise level, inclusive of TGO operations, which were estimated to be below 35dBA, 7dB to 10dB below the ambient noise level. The measurements were conducted whilst open cut mining operations were occurring at TGO whilst either source to receiver winds or temperature inversion conditions occurred.

Comparison of the difference between the 10Hz to 20Hz bands to the 25Hz band shows that noise levels slowly decrease from 25Hz to 10Hz indicating that low frequency noise is not prevalent in the area. Furthermore, the results indicate that low frequency noise is not a feature of gold mining operations when compared to other types of mining as a gold mine has less low frequency noise generating infrastructure compared to that of a coal mine or iron ore mine which has significantly more processing plant – ie coal washery, material handling (stacking, reclaiming), stockpile management, truck or rail loadout facilities plus such mines exported significantly higher volumes of 'final product'.

Table 3 Measured Ambient 1/3 Octave Noise Levels (10-160Hz) – Receiver R23																			
ID	Meteorology Wind Speed & Direction, Stability Class	Measured Ambient Noise Level per 1/3 Octave Band, Hz (Z weighted)[1]													Overall			C-A	TGO Contribution dB LAeq(15min)
		10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	A	C	Z		
284	1m/s S E Class	65	70	71	72	75	78	87	88	94	90	84	88	85	43	62	71	19	<35
287	1m/s S E Class	65	64	59	56	53	51	64	61	53	55	51	51	44	46	66	73	20	<35
301	Calm F Class	65	58	58	54	52	50	55	53	47	54	45	42	38	42	60	69	18	<35
Logarithmic Average		65	62	59	55	53	50	61	58	51	55	49	49	42	44	64	71	19	
Measurement Location		**Difference to 25Hz Band**																	
R23 (284)		-9.9	-4.8	-3.8	-2.1														
R23 (287)		11.9	11.2	6.4	2.8														
R23 (301)		12.6	6.2	6.0	2.5														
Average		**4.9**	**4.2**	**2.9**	**1.1**														

Note 1: Z weighted levels calculated from A weighted measurements,

Note 2: Measurements were A weighted and have been converted to Z weighted values. Generally, at frequencies below 16Hz, measured levels were recorded at 0dBA below the instrument measurement 'floor'. Therefore, the correction to dBZ present conservatively high values as it is likely that the measured dBA values were considerably below 0dBA.

3.2 EPA Comment 2

Information Required

The Proponent must adequately demonstrate that the NBIA has considered LFN against the requirements of Fact Sheet C of the NPfI.

3.2.1 Response 2 – Low Frequency Noise Penalty

In accordance with Fact Sheet C of the NPI, when the C-A value is 15dB or more, the potential for an unbalanced spectrum and potential for increased annoyance, requiring an analysis of one third octave noise levels. Where any of the one-third octave noise levels exceed the values in Table C2 of Fact Sheet C of the NPI, by up 5 dB and cannot be mitigated, a +2dB adjustment is applied to the measured/predicted A- weighted noise levels for the evening and night time periods. Similarly, where any of the one-third octave noise levels exceed the values in Table C2 of Fact Sheet C of the NPI by more than 5dB and cannot be mitigated, a +5dB adjustment is applied to the measured/predicted A-weighted noise levels for the evening and night time periods and a +2dB adjustment is applied for the daytime period.

Review of **Attachment C** shows that predicted one third octave noise levels do not exceed the low frequency content thresholds of Table C2 of Fact Sheet C and hence a low frequency penalty is not applicable to the predicted noise emissions from the Project.

4 Assessment of Maximum Noise Levels

4.1 EPA Comment 1

Section 7.1.1 of the NBIA discusses the assessment of maximum noise levels from the proposal. It states that detailed LAmax levels are presented in Appendix E, however no such levels could be found in the report. It is unclear what events/activities generating maximum noise levels were modelled (including their location(s), and whether a 120 dBA sound power level was assigned to all of these events, or whether different activities attracted different sound power levels.

Information Required

The proponent must clearly state the nature, location and sound power level of all activities/events modelled in the maximum noise level assessment, as well as the predicted noise levels at all sensitive receivers.

4.1.1 Response 1 – Maximum Noise Levels

Appendix E of the NBIA presenting the predicted L_{Amax} noise levels were inadvertently omitted and are presented in **Attachment D**.

Locations of the maximum noise events are presented in **Figure 1** for each assessment scenario.

FIGURE 1

Maximum Noise Source Locations

MAC201136-03LR1

Tomingley Gold Extension Project

KEY

Receivers

- TGO Approved Operations
- SAR Proposed Operations
- Receivers
- 4 Max Src Locations FY24
- 5 Max Src Locations FY25
- 7 Max Src Locations FY27
- 3 Max Src Locations FY30

0 500 1000 1500 2000 2500 3000 3500 m

N

MAC Muller Acoustic Consulting

5 Clarification of Mining Scenario

5.1 EPA Comment 1

Table 27 shows that a quantity of 14 x 45t Drill Rigs was anticipated for the FY26 Mine Scenario, and Table 29 indicates that each of these would attract a sound power level of 114 dBA, which is acoustically significant. Table 29 also shows that only 1-5 Drill Rigs are expected to be used, which does not align with Table 27.

5.1.1 Response 1 – FY26 Scenario

Table 27 from the NBIA presented the number of drills for FY26 in error. Corrected and modelled values are presented in **Table 4** (shaded).

Table 4 (Corrected) Table 27 Indicative Open Cut Mining Equipment

Type - Indicative Model/Capacity	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33
TGO Open Cut Mining Fleet										
Front End Loader Komatsu WA700	1	1	1	1	1	1	1	1	1	1
Underground Haul Truck CAT AD55	1	1	1	1	1	1	1	1	1	1
SAR Open Cut Mining Fleet										
Excavator Hitachi EX1200	2	2	2	1	1	1	1	1	-	-
Excavator Hitachi EX1900	1	1	1	1	1	1	-	-	-	-
Excavator Hitachi EX2600	1	1	1	-	-	-	-	-	-	-
Haul Truck CAT785/789	7	7	3	-	-	-	-	-	-	-
Haul Truck CAT 777F	18	10	13	11	11	10	7	7	-	-
Artic Haul Truck CAT 740	2	2	2	2	2	2	2	2	-	-
Bulldozer Komatsu D475	1	1	1	1	1	1	1	1	-	-
Bulldozer CAT D10	4	4	4	3	3	3	2	2	-	-
Wheel Dozer CAT 854K	1	1	1	1	1	1	1	1	-	-
Front End Loader CAT 988H	1	1	1	1	1	1	1	1	-	-
Grader CAT 16M	3	3	3	2	2	2	2	2	-	-
Water Cart CAT 773WC	2	2	2	2	2	2	2	2	-	-
Drill Rig 45T	1	5	4	3	4	8	2	2	-	-

5.2 EPA Comment 2

Information Required

The proponent should explain why the FY26 mine scenario was not included in the modelled scenario on this basis, or alternatively consider adding FY26 to the list of modelled scenarios

5.2.1 Response 2 – FY26 Scenario

Mining scenarios modelled in the NBIA are presented in **Table 5** - modelled scenarios are a darker shading to those scenarios not modelled.

Table 5 Mining and Waste Sequence

	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33
Mining Sequence												
Caloma 1 Cutback												
TGO underground					Projected							
SAR underground							Projected					
SAR South Pit												
SAR Central Pit												
SAR North Pit												
Waste Sequence												
SAR WRE												
Caloma 1 & 2												
South Pit												
Central Pit												

Scenarios FY24, FY25, FY 27 and FY30 were selected as representative worst case noise emissions, typically having larger quantities of equipment and across many locations compared to other years.

Operations during FY22 and FY23 are less intensive as FY24 with the inclusion of two SAR pits and the start of waste movement to the SAR WRE and to Caloma 1 and Caloma 2.

In FY25, waste is being transported to the South Pit in addition to the SAR WRE, Caloma 1 and Caloma 2, resulting in waste movements to three different locations, whereas in FY26, waste is only being transported to the South Pit. Hence, FY26 is less intensive than FY25.

FY27 was modelled as it captures the change in waste transport to the Central Pit and extractive operations are now from the North Pit only.

Attachment A – Predicted Noise Levels and the Effect of CONCAWE K4 Substitution for ISO9613-2 C_{met}

Attachment A

TGE FY25

	Base Case - ISO9613 with No Met			Scenario 1 D Class Stability using ISO9613 + CONCAWE						Scenario 2 Winds Effect using ISO9613 + CONCAWE						Scenario 3 NPI Noise Enhancing Conditions using ISO9613 + CONCAWE					
Method	No Meteorological Correction			CONCAWE per Period						CONCAWE per Period						CONCAWE per Period					
				P1	P2	P3				P1	P2	P3				P1	P2	P3			
Stability				D	D	D				D	D	D				D	D	F			
Wind Dir				0	0	0				All	All	All				All	All	All			
Wind Speed m/s				0	0	0				1	2	3				3	3	2			
							Diff to No Met						Diff to No Met						Diff to No Met		
Receiver	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
R01-PR	34	31	31	34	31	31	0.2	-0.3	0.0	36	34	34	2.5	2.5	2.4	36	34	34	2.5	2.5	2.4
R02-MOU	33	28	28	33	28	28	-0.3	0.0	0.0	36	30	30	2.2	2.0	2.0	36	30	30	2.2	2.0	2.0
R03-MOU	38	36	36	38	36	36	-0.1	-0.2	0.0	41	39	38	2.8	2.7	2.8	41	39	38	2.8	2.7	2.8
R04-MOU	32	31	31	32	31	31	-0.3	0.1	0.0	35	33	33	2.3	2.3	2.3	35	33	33	2.3	2.3	2.3
R06	35	33	33	35	33	33	-0.2	-0.1	0.0	38	35	35	2.4	2.3	2.3	38	35	35	2.4	2.3	2.3
R08	26	23	22	26	23	22	-0.2	0.4	0.0	28	24	24	1.3	1.1	1.1	28	24	24	1.3	1.1	1.1
R09	27	24	24	27	24	24	-0.2	0.2	0.0	29	25	25	1.6	1.3	1.3	29	25	25	1.6	1.3	1.3
R10	30	27	27	30	27	27	-0.3	-0.4	0.0	32	29	29	2.0	1.9	1.9	32	29	29	2.0	1.9	1.9
R11	30	27	26	30	27	26	0.5	0.4	0.0	32	28	28	2.0	1.8	1.8	32	28	28	2.0	1.8	1.8
R12	26	23	22	26	22	22	0.2	-0.5	0.0	27	24	23	1.3	1.0	1.0	27	24	23	1.3	1.0	1.0
R13-MOU	33	30	30	33	30	30	0.1	-0.3	0.0	35	33	32	2.4	2.3	2.3	35	33	32	2.4	2.3	2.3
R16	35	32	32	35	32	32	0.3	-0.4	0.0	37	35	35	2.6	2.6	2.5	37	35	35	2.6	2.6	2.5
R17-MOU	35	33	32	35	33	32	0.1	0.3	0.0	38	35	35	2.6	2.5	2.6	38	35	35	2.6	2.5	2.6
R18-COMM	35	33	32	35	32	32	0.2	-0.5	0.0	37	35	35	2.6	2.5	2.5	37	35	35	2.6	2.5	2.5
R19	35	33	32	35	33	32	0.0	0.3	0.0	38	35	35	2.6	2.6	2.6	38	35	35	2.6	2.6	2.6
R21-COMM	35	33	33	35	33	33	-0.4	-0.2	0.0	38	36	35	2.7	2.6	2.6	38	36	35	2.7	2.6	2.6
R22-MOU	36	34	34	36	34	34	-0.2	-0.1	0.0	39	37	36	2.6	2.6	2.6	39	37	36	2.6	2.6	2.6
R23-MOU	37	34	34	36	34	34	-0.5	-0.4	0.0	39	37	37	2.7	2.7	2.7	39	37	37	2.7	2.7	2.7
R24-MOU	37	34	34	36	34	34	-0.5	-0.4	0.0	39	37	37	2.7	2.7	2.7	39	37	37	2.7	2.7	2.7
R25-MOU	36	34	34	36	34	34	-0.1	0.0	0.0	39	37	36	2.7	2.7	2.6	39	37	36	2.7	2.7	2.6
R26	36	34	34	36	34	34	-0.2	-0.2	0.0	39	37	36	2.7	2.6	2.7	39	37	36	2.7	2.6	2.7
R27-COMM	37	35	34	37	35	34	0.2	0.2	0.0	40	38	37	2.7	2.7	2.7	40	38	37	2.7	2.7	2.7
R28-MOU	38	36	35	38	36	35	0.5	0.4	0.0	40	38	38	2.8	2.7	2.7	40	38	38	2.8	2.7	2.7
R29-MOU	38	36	36	38	36	36	0.1	0.0	0.0	41	39	38	2.8	2.8	2.7	41	39	38	2.8	2.8	2.7
R32-MOU	37	35	34	37	35	34	0.2	0.1	0.0	40	38	37	2.8	2.7	2.7	40	38	37	2.8	2.7	2.7
R35-MOU	35	33	32	35	33	32	-0.1	0.2	0.0	38	35	35	2.6	2.6	2.5	38	35	35	2.6	2.6	2.5
R37-MOU	35	32	32	35	32	32	0.3	-0.4	0.0	37	35	35	2.5	2.6	2.5	37	35	35	2.5	2.6	2.5
R40	36	34	33	36	34	33	0.3	0.4	0.0	38	36	36	2.6	2.6	2.6	38	36	36	2.6	2.6	2.6
R41-MOU	37	35	35	37	35	35	0.1	0.1	0.0	40	38	37	2.7	2.7	2.7	40	38	37	2.7	2.7	2.7
R42	35	32	32	34	32	32	-0.5	-0.1	0.0	37	35	34	2.5	2.5	2.5	37	35	34	2.5	2.5	2.5
R43	34	33	31	34	33	31	0.1	0.0	0.0	36	36	34	2.2	2.5	2.3	36	36	34	2.2	2.5	2.3
R44-PR	31	30	29	31	30	29	0.1	0.2	0.0	33	32	31	1.8	2.1	2.0	33	32	31	1.8	2.1	2.0
R45-UNOCC	34	33	31	34	32	31	0.5	-0.5	0.0	36	35	33	2.2	2.4	2.3	36	35	33	2.2	2.4	2.3
R47-PR	29	28	28	29	28	28	0.4	-0.1	0.0	30	30	29	1.6	1.8	1.7	30	30	29	1.6	1.8	1.7
R60	32	30	30	32	30	30	0.0	-0.3	0.0	34	32	32	1.8	1.9	2.0	34	32	32	1.8	1.9	2.0
R61-UNOCC	32	30	30	32	30	30	0.2	0.0	0.0	34	32	32	1.7	2.0	2.0	34	32	32	1.7	2.0	2.0
R62-PR	32	30	30	32	30	30	0.2	-0.2	0.0	34	32	32	1.8	1.9	2.0	34	32	32	1.8	1.9	2.0
R63	24	22	21	24	21	21	0.4	-0.5	0.0	24	22	22	0.7	0.8	0.9	24	22	22	0.7	0.8	0.9
R64	26	24	24	26	24	24	-0.1	0.2	0.0	27	25	25	0.6	1.1	1.1	27	25	25	0.6	1.1	1.1
R65	21	19	19	21	19	19	0.1	0.0	0.0	21	19	19	-0.1	0.0	0.0	21	19	19	-0.1	0.0	0.0
R66	24	20	20	24	20	20	0.5	-0.1	0.0	23	20	20	-0.2	0.1	0.2	23	20	20	-0.2	0.1	0.2
R67	23	20	19	23	19	19	0.1	-0.5	0.0	23	20	19	-0.3	0.0	0.1	23	20	19	-0.3	0.0	0.1
R68	20	19	18	20	19	18	-0.2	0.4	0.0	20	19	18	-0.4	-0.1	-0.1	20	19	18	-0.4	-0.1	-0.1
R69	22	19	19	22	19	19	-0.4	-0.4	0.0	22	20	19	-0.5	0.1	0.1	22	20	19	-0.5	0.1	0.1
R70	23	20	20	23	20	20	0.3	0.3	0.0	23	20	20	0.5	0.7	0.7	23	20	20	0.5	0.7	0.7
R71	25	24	24	25	24	24	-0.3	-0.4	0.0	26	26	25	1.0	1.2	1.2	26	26	25	1.0	1.2	1.2
R72	28	25	25	28	25	25	0.5	-0.3	0.0	29	27	27	1.6	1.6	1.5	29	27	27	1.6	1.6	1.5
R73	35	33	33	35	33	33	-0.3	0.0	0.0	38	36	35	2.6	2.6	2.6	38	36	35	2.6	2.6	2.6
R74-MOU	34	32	31	34	32	31	0.0	-0.1	0.0	37	35	34	2.5	2.4	2.4	37	35	34	2.5	2.4	2.4
R75	21	19	19	21	19	19	0.3	-0.4	0.0	21	20	19	-0.1	0.1	0.1	21	20	19	-0.1	0.1	0.1
R76	18	17	16	18	17	16	-0.3	0.4	0.0	17	16	16	-0.9	-0.7	-0.6	17	16	16	-0.9	-0.7	-0.6
R78	24	20	20	24	20	20	0.4	0.0	0.0	24	21	20	0.7	0.5	0.5	24	21	20	0.7	0.5	0.5
R79-MOU	36	34	33	36	34	33	0.3	0.4	0.0	38	36	36	2.7	2.6	2.6	38	36	36	2.7	2.6	2.6
R80-MOU	36	34	33	36	34	33	0.3	0.4	0.0	38	36	36	2.7	2.6	2.6	38	36	36	2.7	2.6	2.6
R81	34	32	32	34	32	32	-0.3	0.0	0.0	37	35	34	2.6	2.5	2.4	37	35	34	2.6	2.5	2.4
R82-PR	28	27	27	28	27	27	-0.2	-0.3	0.0	30	29	29	1.5	1.7	1.7	30	29	29	1.5	1.7	1.7

Attachment B – Detailed Summary of Predicted Noise Levels

Tomingly Gold Extension		PNTL dB LAeq(15min)			Predicted Noise Level - dB LAeq(15min)								
Name	Desc.	Day	Eve	Night	FY24 Day	FY24 Eve	FY24 Night	FY25 Day	FY25 Eve	FY25 Night	FY27 Day	FY27 Eve	FY27 Night
R06	Non-project Related	40	35	35	36	36	35	35	35	35	34	33	33
R08	Non-project Related	40	35	35	26	23	23	26	23	23	26	22	22
R09	Non-project Related	40	35	35	27	24	24	27	25	24	27	24	24
R10	Non-project Related	40	35	35	30	29	29	30	29	28	29	27	27
R11	Non-project Related	40	35	35	29	28	28	29	28	28	29	26	26
R12	Non-project Related	40	35	35	26	23	23	26	23	23	25	22	22
R16	Non-project Related	40	37	37	35	35	34	34	34	34	34	33	33
R18-COMM	Commercial - Operating	63	63	63	35	35	34	34	34	34	34	33	33
R19	Non-project Related	40	35	35	35	35	34	35	35	34	34	33	33
R21-COMM	Commercial - Operating	63	63	63	35	36	35	35	35	35	34	34	34
R26	Non-project Related	40	35	35	36	37	36	36	36	36	35	35	35
R27-COMM	Commercial - Non-operational	63	63	63	37	38	37	36	37	36	36	36	36
R33	Commercial - Non-operational	63	63	63	37	38	37	36	37	36	36	36	36
R40	Non-project Related	40	35	35	36	36	35	35	36	35	35	34	34
R42	Non-project Related	40	35	35	34	34	34	34	34	34	33	33	33
R43	Non-project Related	40	35	35	35	37	36	34	35	34	30	30	29
R45-UNOCC	Unoccupiable	40	35	35	34	36	35	34	35	33	30	30	29
R60	Non-project Related	40	35	35	32	32	32	32	32	32	31	30	30
R61-UNOCC	Unoccupiable	40	35	35	32	32	31	32	32	32	31	30	30
R63	Non-project Related	40	35	35	24	23	23	24	22	22	22	20	20
R64	Non-project Related	40	35	35	26	25	25	26	25	25	25	22	22
R65	Non-project Related	40	35	35	21	19	19	21	19	19	20	17	17
R66	Non-project Related	40	35	35	23	20	19	23	20	20	23	18	18
R67	Non-project Related	40	35	35	22	19	19	23	19	19	22	18	17
R68	Non-project Related	40	35	35	20	18	18	20	18	18	19	16	16
R69	Non-project Related	40	35	35	22	19	19	22	19	19	21	17	17
R70	Non-project Related	40	35	35	23	21	21	23	20	20	22	18	18
R71	Non-project Related	40	35	35	26	26	26	25	26	25	23	22	22
R72	Non-project Related	40	35	35	28	27	27	27	27	26	26	24	24
R73	Non-project Related	40	35	35	35	35	35	35	35	34	34	34	34
R75	Non-project Related	40	35	35	20	19	19	21	19	19	19	16	16
R76	Non-project Related	40	35	35	18	15	15	18	16	16	17	13	13
R78	Non-project Related	40	35	35	23	20	20	23	20	20	23	19	19
R81	Non-project Related	40	35	35	34	34	34	34	34	33	33	33	33

				Difference, Predicted - PNTL FY24			Difference, Predicted - PNTL FY25			Difference, Predicted - PNTL FY27			Difference, Predicted - PNTL FY30		
Name	FY30 Day	FY30 Eve	FY30 Night	Day2	Eve3	Night4	Day5	Eve6	Night7	Day8	Eve9	Night10	Day11	Eve12	Night13
R06	33	32	31	-4	1	0	-5	0	0	-6	-2	-2	-7	-3	-4
R08	25	22	22	-14	-12	-12	-14	-12	-12	-14	-13	-13	-15	-13	-14
R09	26	23	23	-13	-11	-11	-13	-11	-11	-13	-12	-12	-14	-12	-12
R10	29	27	27	-10	-6	-7	-10	-6	-7	-11	-8	-8	-11	-8	-8
R11	28	26	26	-11	-7	-7	-11	-7	-8	-11	-9	-9	-12	-9	-9
R12	25	21	21	-15	-12	-12	-14	-12	-12	-15	-13	-13	-15	-14	-14
R16	33	33	33	-6	-2	-3	-6	-3	-3	-6	-4	-4	-7	-4	-4
R18-COMM	34	33	33	-28	-28	-29	-29	-29	-29	-29	-30	-30	-30	-30	-30
R19	34	33	33	-5	0	-1	-5	0	-1	-6	-2	-2	-6	-2	-2
R21-COMM	34	34	34	-28	-27	-28	-28	-28	-28	-29	-29	-29	-29	-30	-30
R26	35	35	35	-4	2	1	-4	1	1	-5	0	0	-5	0	0
R27-COMM	36	35	35	-26	-26	-26	-27	-26	-27	-27	-27	-27	-28	-28	-28
R33	36	35	35	-26	-26	-26	-27	-26	-27	-27	-27	-27	-28	-28	-28
R40	34	34	34	-5	1	0	-5	1	0	-5	-1	-1	-6	-1	-1
R42	33	32	32	-6	-1	-1	-6	-1	-2	-7	-2	-2	-7	-3	-3
R43	29	30	27	-5	2	1	-6	0	-1	-10	-5	-6	-11	-5	-8
R45-UNOCC	29	30	27	-6	1	0	-7	0	-2	-10	-5	-6	-11	-5	-8
R60	29	27	27	-8	-3	-4	-8	-3	-3	-9	-5	-5	-11	-8	-8
R61-UNOCC	29	27	26	-9	-4	-4	-8	-3	-3	-10	-5	-5	-11	-9	-9
R63	22	18	18	-16	-12	-13	-17	-13	-13	-18	-15	-15	-18	-17	-17
R64	24	18	18	-14	-10	-10	-14	-10	-11	-15	-13	-13	-17	-17	-17
R65	19	14	14	-19	-16	-16	-19	-16	-16	-20	-18	-18	-21	-21	-21
R66	22	16	16	-17	-15	-16	-17	-15	-15	-17	-17	-17	-18	-19	-19
R67	22	16	15	-18	-16	-16	-17	-16	-16	-18	-17	-18	-18	-20	-20
R68	18	14	14	-20	-17	-17	-20	-17	-17	-21	-19	-19	-22	-21	-21
R69	21	15	14	-18	-16	-16	-18	-16	-16	-19	-18	-18	-19	-20	-21
R70	21	17	17	-17	-14	-14	-18	-15	-15	-18	-17	-17	-19	-18	-18
R71	21	19	18	-15	-9	-9	-15	-9	-10	-17	-13	-13	-19	-16	-17
R72	26	24	23	-13	-8	-8	-13	-8	-9	-14	-11	-11	-14	-12	-12
R73	34	33	33	-5	0	0	-5	0	-1	-6	-1	-1	-6	-2	-2
R75	18	15	14	-20	-16	-16	-19	-16	-16	-21	-19	-19	-22	-20	-21
R76	16	12	11	-22	-20	-20	-22	-19	-19	-23	-22	-22	-24	-23	-24
R78	22	17	17	-17	-15	-15	-17	-15	-15	-17	-16	-17	-18	-18	-18
R81	33	32	32	-6	-1	-1	-6	-1	-2	-7	-2	-3	-7	-3	-3
		No. receivers over PNTL		0	5	2	0	1	1	0	0	0	0	0	0
		No receivers over PNTL <1dB			3	2	0	1	1	0	0	0	0	0	0
		No receivers over PNTL >1dB		0	2	0	0	0	0	0	0	0	0	0	0
		No receivers over PNTL >2dB		0	0	0	0	0	0	0	0	0	0	0	0

This page has been intentionally left blank

Attachment C – Low Frequency Noise Assessment

Tomingley Gold Extension Project

		Low Frequency "tail" - Applied increase from 25Hz Band, dB												
FY24		*5.9*	*4.5*	*2.9*	*1.1*	Predicted A-Weighted 1/3 Octave values from Model (25-160Hz) Daytime								
Name	**Day Total dBA**	***10Hz***	***12.5Hz***	***16Hz***	***20Hz***	**25Hz**	**31Hz**	**40Hz**	**50Hz**	**63Hz**	**80Hz**	**100Hz**	**125Hz**	**160Hz**
R01-PR	34	*16*	*15*	*13*	*12*	11	11	11	17	18	20	22	22	21
R02-MOU	31	*18*	*17*	*15*	*13*	12	12	12	17	18	19	21	20	19
R03-MOU	40	*20*	*19*	*17*	*15*	14	14	14	20	21	23	26	25	25
R04-MOU	34	*13*	*11*	*10*	*8*	7	7	7	16	17	18	22	21	21
R06	37	*18*	*17*	*15*	*13*	12	12	13	20	21	22	25	25	24
R08	24	*10*	*8*	*7*	*5*	4	4	4	11	12	13	16	15	14
R09	26	*11*	*9*	*8*	*6*	5	5	5	12	13	14	17	16	15
R10	30	*13*	*12*	*10*	*8*	7	7	7	15	15	17	20	19	18
R11	29	*13*	*11*	*10*	*8*	7	7	7	14	15	16	19	18	17
R12	24	*9*	*8*	*6*	*4*	3	3	3	11	11	13	16	15	14
R13-MOU	33	*16*	*14*	*13*	*11*	10	10	10	17	17	19	22	21	20
R16	36	*17*	*16*	*14*	*12*	11	11	11	18	19	20	23	23	22
R17-MOU	36	*17*	*16*	*14*	*12*	11	11	12	18	19	20	23	23	22
R18-COMM	36	*17*	*16*	*14*	*12*	11	11	11	18	19	20	23	23	22
R19	36	*17*	*16*	*14*	*13*	12	12	12	18	19	21	23	23	22
R21-COMM	37	*18*	*16*	*15*	*13*	12	12	12	19	19	21	24	23	23
R22-MOU	37	*18*	*17*	*15*	*13*	12	12	13	19	20	21	24	24	23
R23-MOU	38	*19*	*17*	*16*	*14*	13	13	13	19	20	22	24	24	23
R24-MOU	38	*19*	*17*	*16*	*14*	13	13	13	19	20	22	24	24	23
R25-MOU	38	*18*	*17*	*15*	*13*	12	12	12	19	20	21	24	24	23
R26	38	*18*	*17*	*15*	*13*	12	13	13	19	20	21	24	24	23
R27-COMM	39	*19*	*17*	*16*	*14*	13	13	13	20	20	22	25	24	24
R28-MOU	39	*19*	*18*	*16*	*15*	14	14	14	20	21	22	25	25	24
R29-MOU	40	*20*	*18*	*17*	*15*	14	14	14	20	21	23	26	25	25
R32-MOU	39	*19*	*17*	*16*	*14*	13	13	13	20	20	22	25	24	24
R35-MOU	36	*17*	*16*	*14*	*13*	12	12	12	18	19	21	23	23	22
R37-MOU	36	*17*	*16*	*14*	*12*	11	11	11	18	19	20	23	23	22
R40	37	*18*	*17*	*15*	*13*	12	12	12	19	19	21	24	23	23
R41-MOU	38	*19*	*18*	*16*	*14*	13	13	13	20	20	22	25	24	24
R42	35	*17*	*16*	*14*	*12*	11	11	11	18	19	20	23	22	22
R43	38	*12*	*11*	*9*	*7*	6	7	7	18	18	18	26	25	25
R44-PR	33	*10*	*9*	*7*	*5*	4	5	5	15	15	16	24	23	23
R45-UNOCC	36	*12*	*11*	*9*	*8*	7	7	7	17	17	18	25	24	24
R47-PR	30	*5*	*4*	*2*	*0*	-1	1	1	13	13	13	21	21	20
R60	32	*13*	*12*	*10*	*8*	7	8	8	16	16	17	22	22	21
R61-UNOCC	32	*13*	*12*	*10*	*8*	7	7	7	16	16	17	22	22	21
R62-PR	32	*13*	*11*	*10*	*8*	7	7	7	16	16	17	22	22	21
R63	23	*5*	*4*	*2*	*0*	-1	-1	0	9	10	10	16	15	14
R64	25	*7*	*6*	*4*	*2*	1	2	2	11	11	11	18	17	16
R65	19	*2*	*0*	*-1*	*-3*	-4	-4	-3	7	7	7	13	12	11
R66	20	*5*	*4*	*2*	*0*	-1	0	0	8	8	9	14	13	11
R67	19	*4*	*3*	*1*	*0*	-1	-1	-1	7	8	8	13	12	10
R68	19	*0*	*-1*	*-3*	*-5*	-6	-5	-5	6	6	6	13	12	10
R69	19	*4*	*2*	*1*	*-1*	-2	-2	-2	6	7	7	13	12	11
R70	22	*5*	*3*	*2*	*0*	-1	-1	-1	8	9	9	15	14	12
R71	26	*4*	*2*	*1*	*-1*	-2	-1	-1	11	11	11	19	18	17
R72	28	*9*	*8*	*6*	*5*	4	4	4	13	13	14	18	18	17
R73	37	*18*	*16*	*15*	*13*	12	12	12	18	19	21	24	23	23
R74-MOU	36	*16*	*14*	*13*	*11*	10	10	10	17	18	19	23	22	21
R75	19	*0*	*-2*	*-3*	*-5*	-6	-5	-5	6	6	6	13	12	11
R76	16	*-2*	*-3*	*-5*	*-7*	-8	-7	-7	4	4	4	10	9	7
R78	21	*6*	*5*	*3*	*2*	1	1	1	9	9	10	14	13	11
R79-MOU	37	*18*	*17*	*15*	*13*	12	12	12	19	19	21	24	23	23
R80-MOU	37	*18*	*17*	*15*	*13*	12	12	12	19	20	21	24	23	23
R81	35	*17*	*15*	*14*	*12*	11	11	11	18	18	20	23	22	22
R82-PR	30	*6*	*5*	*3*	*1*	0	1	2	13	13	14	21	20	20

		Calculated Z-Weighted 1/3 Octave Values (25-160Hz) - Daytime												
FY24	Day Total dBZ	*10Hz*	*12.5Hz*	*16Hz*	*20Hz*	25Hz	31Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz
R01-PR	87	87	78	70	62	55	50	45	48	44	42	41	38	35
R02-MOU	89	89	80	72	64	57	52	47	47	44	42	40	36	33
R03-MOU	91	90	82	73	66	59	54	49	50	48	45	45	41	38
R04-MOU	84	83	75	66	58	52	47	42	47	43	41	41	37	34
R06	89	89	80	72	64	57	52	47	50	47	45	44	41	37
R08	81	80	72	63	55	49	43	38	42	38	36	35	31	27
R09	82	81	73	64	56	50	44	40	42	39	37	36	32	28
R10	84	84	75	67	59	52	47	42	45	41	39	39	35	32
R11	84	83	75	66	58	51	46	41	44	41	38	38	34	31
R12	80	79	71	62	55	48	43	38	41	38	35	35	31	27
R13-MOU	87	86	78	69	61	55	49	44	47	44	41	41	37	34
R16	88	87	79	70	63	56	51	46	48	45	43	42	39	35
R17-MOU	88	88	79	71	63	56	51	46	48	45	43	42	39	36
R18-COMM	88	88	79	71	63	56	51	46	48	45	43	42	39	36
R19	89	88	80	71	63	56	51	46	48	45	43	42	39	36
R21-COMM	89	88	80	71	63	57	51	47	49	46	43	43	39	36
R22-MOU	89	89	80	72	64	57	52	47	49	46	44	43	40	37
R23-MOU	90	89	81	72	64	58	52	47	50	46	44	43	40	37
R24-MOU	90	89	81	72	64	57	52	47	50	46	44	43	40	37
R25-MOU	89	89	80	72	64	57	52	47	49	46	44	43	40	37
R26	89	89	80	72	64	57	52	47	49	46	44	43	40	37
R27-COMM	90	89	81	72	64	58	52	48	50	47	44	44	40	37
R28-MOU	90	90	81	73	65	58	53	48	50	47	45	44	41	38
R29-MOU	91	90	82	73	65	59	53	49	50	47	45	45	41	38
R32-MOU	90	89	81	72	64	58	52	48	50	47	44	44	40	37
R35-MOU	89	88	80	71	63	56	51	46	49	45	43	42	39	36
R37-MOU	89	88	80	71	64	57	51	47	49	46	43	43	39	36
R40	90	89	81	72	65	58	53	48	50	47	44	44	40	37
R41-MOU	88	87	79	70	63	56	51	46	48	45	43	42	39	35
R42	83	82	74	65	58	51	46	42	48	44	41	45	42	38
R43	81	80	72	63	56	49	44	40	46	42	38	43	39	36
R44-PR	84	83	75	66	58	51	47	42	47	44	40	44	40	37
R45-UNOCC	76	75	67	58	51	44	40	36	43	39	36	40	37	34
R47-PR	84	84	75	67	59	52	47	42	46	43	40	41	38	34
R60	84	83	75	66	59	52	47	42	46	42	39	41	38	34
R61-UNOCC	84	83	75	66	58	52	47	42	46	42	39	41	38	35
R62-PR	76	75	67	58	51	44	39	34	40	36	33	35	31	27
R63	78	78	69	61	53	46	41	37	41	37	34	37	33	30
R64	73	72	64	55	47	41	36	31	37	33	30	32	28	24
R65	76	76	67	59	51	44	39	34	38	35	31	33	29	24
R66	76	75	67	58	50	43	38	34	38	34	30	32	28	24
R67	71	70	62	53	46	39	34	30	36	32	29	32	28	23
R68	75	74	66	57	49	42	37	33	37	33	29	32	28	24
R69	76	75	67	58	50	44	39	34	39	35	32	34	30	26
R70	75	74	66	57	49	43	38	34	41	37	34	38	34	30
R71	81	80	72	63	55	48	43	38	43	39	37	37	34	30
R72	89	88	80	71	63	57	51	47	49	45	43	43	39	36
R73	87	86	78	69	61	55	49	45	48	44	42	42	38	35
R74-MOU	71	70	62	53	45	39	34	30	36	32	29	32	28	24
R75	69	68	60	51	44	37	32	28	34	30	26	29	25	20
R76	78	77	69	60	52	45	40	35	39	35	32	33	29	25
R78	89	88	80	71	64	57	52	47	49	46	44	43	39	36
R79-MOU	89	88	80	71	64	57	52	47	49	46	44	43	39	36
R80-MOU	88	87	79	70	62	56	50	46	48	45	42	42	38	35
R81	77	77	68	60	52	45	41	37	43	40	36	40	37	33

		Low Frequency "tail" - Applied increase from 25Hz Band, dB												
FY24		5.9	4.5	2.9	1.1	Predicted A-Weighted 1/3 Octave values from Model (25-160Hz) Evening								
Name	Evening Total dBA	10Hz	12.5Hz	16Hz	20Hz	25Hz	31Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz
R01-PR	33	8	7	5	3	2	3	3	15	16	17	21	20	20
R02-MOU	29	10	8	7	5	4	4	4	14	15	16	19	19	18
R03-MOU	40	11	10	8	7	6	6	6	18	19	20	24	24	23
R04-MOU	34	6	5	3	1	0	1	1	15	15	16	21	21	20
R06	36	8	7	5	3	2	3	4	17	17	17	24	24	23
R08	23	3	2	0	-1	-2	-2	-2	9	10	11	15	14	13
R09	24	4	3	1	0	-2	-2	-2	10	11	12	16	15	14
R10	29	5	4	2	0	-1	0	0	12	13	14	18	18	17
R11	28	5	3	2	0	-1	-1	-1	12	13	13	18	17	16
R12	23	2	0	-1	-3	-4	-4	-4	9	9	10	15	14	13
R13-MOU	32	8	6	5	3	2	2	2	14	15	16	20	20	19
R16	35	9	7	6	4	3	3	3	16	16	17	22	21	21
R17-MOU	35	9	8	6	4	3	3	4	16	17	18	22	21	21
R18-COMM	35	9	8	6	4	3	3	4	16	16	18	22	21	21
R19	35	9	8	6	4	3	4	4	16	17	18	22	22	21
R21-COMM	36	9	8	6	5	4	4	4	16	17	18	22	22	21
R22-MOU	37	10	9	7	5	4	4	5	17	18	19	23	22	22
R23-MOU	37	10	9	7	5	4	5	5	17	18	19	23	23	22
R24-MOU	37	10	9	7	5	4	5	5	17	18	19	23	23	22
R25-MOU	37	10	9	7	5	4	4	5	17	18	19	23	22	22
R26	37	10	9	7	5	4	4	5	17	18	19	23	22	22
R27-COMM	38	10	9	7	6	5	5	5	17	18	19	23	23	22
R28-MOU	39	11	10	8	6	5	5	6	18	19	20	24	23	23
R29-MOU	40	11	10	8	6	5	6	6	18	19	20	24	24	23
R32-MOU	38	10	9	7	5	4	5	5	17	18	19	23	23	22
R35-MOU	36	9	8	6	4	3	4	4	16	17	18	22	22	21
R37-MOU	35	9	7	6	4	3	3	3	16	16	18	22	21	21
R40	36	10	8	7	5	4	4	4	16	17	18	22	22	21
R41-MOU	38	11	9	8	6	5	5	5	17	18	19	23	23	22
R42	35	9	7	6	4	3	3	3	15	16	17	22	21	20
R43	38	6	5	3	1	0	3	4	17	17	17	26	25	25
R44-PR	33	4	2	1	-1	-2	0	2	15	15	15	24	23	23
R45-UNOCC	36	6	5	3	1	0	2	3	16	16	16	25	24	23
R47-PR	30	2	0	-1	-3	-4	-2	0	13	13	13	21	21	20
R60	32	5	4	2	1	-1	1	2	15	15	16	22	22	21
R61-UNOCC	32	5	4	2	0	-1	1	1	15	15	15	22	21	21
R62-PR	32	5	4	2	0	-1	1	2	15	15	15	22	22	21
R63	23	-1	-2	-4	-6	-7	-6	-5	8	8	9	16	15	14
R64	25	0	-1	-3	-5	-6	-4	-3	10	10	10	18	17	16
R65	19	-3	-4	-6	-7	-9	-7	-7	6	6	6	13	12	10
R66	20	-2	-4	-5	-7	-8	-7	-6	7	7	7	13	12	11
R67	19	-3	-5	-6	-8	-9	-8	-7	6	6	6	13	12	10
R68	18	-4	-5	-7	-9	-10	-9	-8	5	5	5	13	11	10
R69	19	-4	-5	-7	-9	-10	-8	-7	6	6	6	13	12	11
R70	21	-2	-3	-5	-6	-8	-7	-6	7	7	7	14	13	12
R71	26	0	-1	-3	-5	-6	-4	-2	10	10	10	19	18	17
R72	27	3	2	0	-2	-3	-2	-2	11	12	12	18	17	16
R73	36	9	8	6	5	4	4	4	16	17	18	22	22	21
R74-MOU	35	8	6	5	3	2	2	3	15	16	17	21	21	20
R75	19	-5	-6	-8	-10	-11	-9	-8	5	5	5	13	12	11
R76	15	-6	-7	-9	-11	-12	-11	-10	3	3	3	10	9	7
R78	20	0	-2	-3	-5	-6	-6	-6	7	7	8	13	12	10
R79-MOU	36	10	8	7	5	4	4	4	16	17	18	22	22	21
R80-MOU	36	10	8	7	5	4	4	4	16	17	18	22	22	21
R81	34	9	7	6	4	3	3	3	15	16	17	21	21	20
R82-PR	29	2	1	-1	-3	-4	-2	-1	13	13	13	21	20	20

		Calculated Z-Weighted 1/3 Octave Values (25-160Hz) - Evening												
FY24	Evening Total dBZ	10Hz	12.5Hz	16Hz	20Hz	25Hz	31Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz
R01-PR	79	79	70	62	54	47	42	37	45	42	39	40	36	33
R02-MOU	81	80	72	63	55	48	43	38	44	41	38	38	35	31
R03-MOU	82	82	73	65	57	50	45	41	49	45	43	43	40	37
R04-MOU	77	76	68	59	52	45	40	36	45	41	38	40	37	33
R06	79	79	70	62	54	47	43	39	47	43	40	43	40	37
R08	75	74	66	57	49	42	37	32	39	36	33	34	30	26
R09	75	75	66	58	50	43	38	33	40	37	34	35	31	27
R10	76	76	67	59	51	44	39	35	43	39	37	37	34	30
R11	76	75	67	58	50	44	39	34	42	39	36	37	33	30
R12	73	72	64	55	47	40	35	31	39	36	33	34	30	26
R13-MOU	79	78	70	61	53	46	41	37	44	41	39	39	36	32
R16	80	79	71	62	54	48	43	38	46	43	40	41	37	34
R17-MOU	80	79	71	62	55	48	43	38	46	43	40	41	37	34
R18-COMM	80	79	71	62	55	48	43	38	46	43	40	41	37	34
R19	80	79	71	62	55	48	43	38	46	43	40	41	38	34
R21-COMM	81	80	72	63	55	48	43	39	46	43	41	41	38	35
R22-MOU	81	80	72	63	56	49	44	39	47	44	41	42	38	35
R23-MOU	81	81	72	64	56	49	44	40	47	44	41	42	39	35
R24-MOU	81	81	72	64	56	49	44	39	47	44	41	42	39	35
R25-MOU	81	80	72	63	56	49	44	39	47	44	41	42	38	35
R26	81	80	72	63	56	49	44	39	47	44	41	42	38	35
R27-COMM	81	81	72	64	56	49	44	40	48	44	42	42	39	36
R28-MOU	82	81	73	64	57	50	45	40	48	45	42	43	40	36
R29-MOU	82	82	73	65	57	50	45	41	48	45	43	43	40	37
R32-MOU	81	81	72	64	56	49	44	40	47	44	42	42	39	36
R35-MOU	80	80	71	63	55	48	43	38	46	43	40	41	38	34
R37-MOU	81	80	72	63	55	48	43	39	46	43	41	41	38	35
R40	82	81	73	64	56	49	44	40	48	44	42	42	39	36
R41-MOU	80	79	71	62	54	48	43	38	46	42	40	41	37	34
R42	77	77	68	60	52	45	42	39	47	43	40	45	41	38
R43	75	74	66	57	49	42	40	36	45	41	37	43	39	36
R44-PR	77	76	68	59	52	45	41	38	46	42	39	44	40	37
R45-UNOCC	73	72	64	55	47	40	38	34	43	39	35	40	37	33
R47-PR	76	76	67	59	51	44	40	36	45	41	38	41	38	34
R60	76	75	67	58	51	44	40	36	45	41	38	41	37	34
R61-UNOCC	76	75	67	58	51	44	40	36	45	41	38	41	38	34
R62-PR	70	69	61	52	45	38	34	30	39	35	31	35	31	27
R63	71	70	62	53	46	39	35	32	40	36	33	37	33	30
R64	68	68	59	51	43	36	32	28	36	32	29	32	28	24
R65	69	68	60	51	43	37	33	29	37	33	30	32	28	24
R66	68	67	59	50	42	36	32	28	36	32	29	32	28	24
R67	67	66	58	49	42	35	31	27	35	31	28	32	28	23
R68	67	67	58	50	42	35	31	28	36	32	28	32	28	24
R69	69	69	60	52	44	37	33	29	37	33	30	33	29	25
R70	71	71	62	54	46	39	36	32	41	37	33	38	34	30
R71	74	73	65	56	49	42	37	33	41	38	35	37	33	29
R72	80	80	71	63	55	48	43	39	46	43	41	41	38	35
R73	79	78	70	61	53	47	42	37	46	42	39	41	37	34
R74-MOU	66	66	57	49	41	34	31	27	36	32	28	32	28	24
R75	65	64	56	47	40	33	29	25	33	29	25	29	25	20
R76	71	70	62	53	45	38	34	29	37	33	30	32	28	24
R78	81	80	72	63	55	48	43	39	47	43	41	41	38	35
R79-MOU	81	80	72	63	55	49	44	39	47	43	41	41	38	35
R80-MOU	80	79	71	62	54	47	42	38	46	42	40	40	37	34
R81	73	72	64	55	48	41	37	34	43	39	35	40	36	33

		Low Frequency "tail" - Applied increase from 25Hz Band, dB												
FY24		5.9	4.5	2.9	1.1	Predicted A-Weighted 1/3 Octave values from Model (25-160Hz) Night								
Name	Night Total dBA	10Hz	12.5Hz	16Hz	20Hz	25Hz	31Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz
R01-PR	33	8	7	5	3	2	2	2	15	15	17	21	20	20
R02-MOU	29	9	8	6	5	4	4	3	14	15	16	19	19	18
R03-MOU	39	11	10	8	6	5	5	6	18	19	20	24	24	23
R04-MOU	33	6	5	3	1	0	0	1	14	15	15	21	21	20
R06	35	8	7	5	3	2	3	4	17	17	17	24	24	23
R08	23	3	2	0	-1	-3	-3	-3	9	10	10	15	14	13
R09	24	4	3	1	-1	-2	-2	-2	10	11	11	16	15	14
R10	29	5	4	2	0	-1	-1	-1	12	13	14	18	18	17
R11	28	5	3	2	0	-1	-1	-1	12	12	13	18	17	16
R12	23	1	0	-2	-3	-4	-4	-4	9	9	10	14	14	12
R13-MOU	32	7	6	4	3	2	2	2	14	15	16	20	20	19
R16	34	9	7	6	4	3	3	3	15	16	17	21	21	20
R17-MOU	34	9	8	6	4	3	3	3	15	16	17	22	21	21
R18-COMM	35	9	8	6	4	3	3	3	15	16	17	22	21	21
R19	35	9	8	6	4	3	3	3	16	16	18	22	21	21
R21-COMM	35	9	8	6	5	4	4	4	16	17	18	22	22	21
R22-MOU	36	10	9	7	5	4	4	4	16	17	18	23	22	22
R23-MOU	37	10	9	7	5	4	4	4	17	18	19	23	22	22
R24-MOU	37	10	9	7	5	4	4	4	17	18	19	23	22	22
R25-MOU	36	10	8	7	5	4	4	4	16	17	18	23	22	22
R26	36	10	9	7	5	4	4	4	17	17	19	23	22	22
R27-COMM	37	10	9	7	5	4	4	5	17	18	19	23	23	22
R28-MOU	38	11	9	8	6	5	5	5	17	18	20	24	23	23
R29-MOU	39	11	10	8	6	5	5	5	18	19	20	24	24	23
R32-MOU	37	10	9	7	5	4	4	4	17	18	19	23	23	22
R35-MOU	35	9	8	6	4	3	3	3	16	16	18	22	21	21
R37-MOU	34	9	7	6	4	3	3	3	15	16	17	22	21	21
R40	35	9	8	6	5	4	4	4	16	17	18	22	22	21
R41-MOU	37	10	9	7	6	5	5	5	17	18	19	23	23	22
R42	34	9	7	6	4	3	3	3	15	16	17	21	21	20
R43	36	6	4	3	1	0	2	4	16	16	16	25	25	25
R44-PR	33	3	2	0	-1	-3	0	2	15	15	15	23	23	22
R45-UNOCC	34	6	4	3	1	0	1	3	15	15	15	24	24	23
R47-PR	30	1	0	-2	-3	-5	-2	-1	12	12	12	21	21	20
R60	32	5	4	2	0	-1	0	1	15	15	15	22	21	21
R61-UNOCC	31	5	4	2	0	-1	0	1	14	15	15	22	21	21
R62-PR	32	5	4	2	0	-1	0	1	15	15	15	22	22	21
R63	23	-1	-2	-4	-6	-7	-6	-5	8	8	8	16	15	14
R64	25	0	-1	-3	-5	-6	-4	-3	10	10	10	18	17	16
R65	19	-3	-4	-6	-8	-9	-8	-7	6	6	6	13	12	10
R66	19	-3	-4	-6	-7	-8	-7	-6	6	7	7	13	12	11
R67	19	-3	-5	-6	-8	-9	-8	-7	6	6	6	13	12	10
R68	18	-4	-5	-7	-9	-10	-9	-8	5	5	5	12	11	10
R69	19	-4	-5	-7	-9	-10	-8	-7	5	5	5	13	12	10
R70	21	-2	-3	-5	-7	-8	-7	-6	7	7	7	14	13	12
R71	26	0	-1	-3	-5	-6	-4	-3	10	10	10	18	18	17
R72	27	3	1	0	-2	-3	-3	-2	11	11	12	18	17	16
R73	35	9	8	6	4	3	3	4	16	17	18	22	22	21
R74-MOU	34	8	6	5	3	2	2	2	15	16	17	21	21	20
R75	19	-5	-6	-8	-10	-11	-9	-8	5	5	5	13	12	10
R76	15	-6	-7	-9	-11	-12	-11	-10	3	3	3	10	9	7
R78	20	-1	-2	-4	-5	-6	-6	-6	6	7	7	13	12	10
R79-MOU	35	9	8	6	5	4	4	4	16	17	18	22	22	21
R80-MOU	35	10	8	7	5	4	4	4	16	17	18	22	22	21
R81	34	8	7	5	4	3	3	3	15	16	17	21	21	20
R82-PR	29	2	0	-1	-3	-4	-2	-1	12	12	12	21	20	19

		Calculated Z-Weighted 1/3 Octave Values (25-160Hz) - Night												
FY24	Night Total dBZ	10Hz	12.5Hz	16Hz	20Hz	25Hz	31Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz
R01-PR	79	79	70	62	54	47	42	37	45	42	39	40	36	33
R02-MOU	81	80	72	63	55	48	43	38	44	41	38	38	35	31
R03-MOU	82	82	73	65	57	50	45	40	48	45	42	43	40	37
R04-MOU	77	76	68	59	52	45	40	35	44	41	38	40	37	33
R06	79	78	70	61	54	47	42	38	47	43	40	43	40	36
R08	74	74	65	57	49	42	37	32	39	36	33	34	30	26
R09	75	75	66	58	50	43	38	33	40	37	34	35	31	27
R10	76	76	67	59	51	44	39	34	42	39	36	37	34	30
R11	76	75	67	58	50	43	38	34	42	38	36	37	33	30
R12	73	72	64	55	47	40	35	31	39	35	33	34	30	26
R13-MOU	79	78	70	61	53	46	41	36	44	41	38	39	36	32
R16	80	79	71	62	54	48	42	38	45	42	40	41	37	34
R17-MOU	80	79	71	62	55	48	43	38	46	42	40	41	37	34
R18-COMM	80	79	71	62	55	48	42	38	46	42	40	41	37	34
R19	80	79	71	62	55	48	43	38	46	43	40	41	38	34
R21-COMM	80	80	71	63	55	48	43	38	46	43	40	41	38	35
R22-MOU	81	80	72	63	56	49	43	39	47	43	41	42	38	35
R23-MOU	81	81	72	64	56	49	44	39	47	44	41	42	39	35
R24-MOU	81	80	72	63	56	49	44	39	47	44	41	42	38	35
R25-MOU	81	80	72	63	55	49	43	39	47	43	41	42	38	35
R26	81	80	72	63	56	49	43	39	47	44	41	42	38	35
R27-COMM	81	81	72	64	56	49	44	39	47	44	42	42	39	36
R28-MOU	82	81	73	64	56	50	44	40	48	45	42	43	39	36
R29-MOU	82	82	73	65	57	50	45	40	48	45	42	43	40	37
R32-MOU	81	81	72	64	56	49	44	39	47	44	41	42	39	36
R35-MOU	80	79	71	62	55	48	43	38	46	43	40	41	38	34
R37-MOU	81	80	72	63	55	48	43	38	46	43	41	41	38	35
R40	82	81	73	64	56	49	44	39	47	44	42	42	39	36
R41-MOU	80	79	71	62	54	47	42	37	45	42	40	41	37	34
R42	77	76	68	59	51	45	42	38	46	43	39	44	41	38
R43	74	74	65	57	49	42	39	36	45	41	37	42	39	36
R44-PR	77	76	68	59	51	44	41	37	46	42	38	43	40	36
R45-UNOCC	72	72	63	55	47	40	37	34	42	38	35	40	37	33
R47-PR	76	76	67	59	51	44	40	36	45	41	38	41	37	34
R60	76	75	67	58	51	44	40	36	45	41	38	41	37	34
R61-UNOCC	76	75	67	58	51	44	40	36	45	41	38	41	38	34
R62-PR	70	69	61	52	45	38	34	30	38	34	31	35	31	27
R63	71	70	62	53	46	39	35	32	40	36	32	37	33	29
R64	68	68	59	51	43	36	32	28	36	32	29	32	28	24
R65	69	68	60	51	43	36	32	28	37	33	29	32	28	24
R66	68	67	59	50	42	36	31	28	36	32	28	32	28	24
R67	67	66	58	49	42	35	31	27	35	31	27	31	27	23
R68	67	67	58	50	42	35	31	27	36	32	28	32	28	24
R69	69	69	60	52	44	37	33	28	37	33	30	33	29	25
R70	71	70	62	53	46	39	36	32	40	36	33	38	34	30
R71	74	73	65	56	48	42	37	32	41	38	34	37	33	29
R72	80	80	71	63	55	48	43	38	46	43	40	41	38	34
R73	79	78	70	61	53	46	41	37	45	42	39	40	37	34
R74-MOU	66	65	57	48	41	34	30	27	35	31	27	32	28	24
R75	65	64	56	47	40	33	29	25	33	29	25	29	25	20
R76	71	70	62	53	45	38	33	29	37	33	30	32	28	24
R78	81	80	72	63	55	48	43	38	46	43	41	41	38	35
R79-MOU	81	80	72	63	55	49	43	38	46	43	41	41	38	35
R80-MOU	80	79	71	62	54	47	42	37	45	42	40	40	37	34
R81	73	72	64	55	47	41	37	34	43	39	35	40	36	33

Attachment D – LA_{max} Noise Levels

				FY24	FY25	FY27	FY30	FY24	FY25	FY27	FY30
		LAeq(15min)	LAmax	LAeq(15min)	LAeq(15min)	LAeq(15min)	LAeq(15min)	LAmax	LAmax	LAmax	LAmax
Name	Desc.	PNTL Night	MNTL	FY24 Night	FY25 Night	FY27 Night	FY30 Night	FY24 Night	FY25 Night	FY27 Night	FY30 Night
R01-PR	Project Related	35	52	33	33	32	32	36	35	35	35
R02-MOU	Non-project Related - Memorandum of Understan	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R03-MOU	Non-project Related - Memorandum of Understan	37	52	38	38	37	37	41	38	38	38
R04-MOU	Non-project Related - Memorandum of Understan	35	52	33	33	30	<30	36	35	35	35
R06	Non-project Related	35	52	35	35	33	31	36	36	36	36
R08	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R09	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R10	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R11	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R12	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R13-MOU	Non-project Related - Memorandum of Understan	35	52	32	32	31	30	35	<35	<35	<35
R16	Non-project Related	37	52	34	34	33	33	37	35	35	36
R17-MOU	Non-project Related - Memorandum of Understan	37	52	34	34	33	33	37	36	36	36
R18-COMM	Commercial - Operating	63	N/A	34	34	33	33	38	36	36	36
R19	Non-project Related	35	52	34	34	33	33	38	36	36	36
R21-COMM	Commercial - Operating	63	N/A	35	35	34	34	38	36	36	36
R22-MOU	Non-project Related - Memorandum of Understan	37	52	36	36	35	35	39	37	37	37
R23-MOU	Non-project Related - Memorandum of Understan	37	52	36	36	35	35	39	37	37	37
R24-MOU	Non-project Related - Memorandum of Understan	37	52	36	36	35	35	39	37	37	37
R25-MOU	Non-project Related - Memorandum of Understan	37	52	36	36	35	34	39	37	37	37
R26	Non-project Related	35	52	36	36	35	35	39	37	37	37
R27-COMM	Commercial - Non-operational	63	N/A	37	36	36	35	40	37	37	37
R28-MOU	Non-project Related - Memorandum of Understan	37	52	38	37	36	36	40	38	38	38
R29-MOU	Non-project Related - Memorandum of Understan	37	52	38	38	37	36	41	38	38	38
R33	Commercial - Non-operational	63	N/A	37	36	36	35	40	37	37	37
R32-MOU	Non-project Related - Memorandum of Understan	37	52	37	36	35	35	40	38	38	38
R35-MOU	Non-project Related - Memorandum of Understan	37	52	35	34	33	33	38	36	36	36
R37-MOU	Non-project Related - Memorandum of Understan	37	52	34	34	33	33	37	35	35	35
R40	Non-project Related	35	52	35	35	34	34	38	36	36	36
R41-MOU	Non-project Related - Memorandum of Understan	35	52	37	36	36	35	40	38	38	38
R42	Non-project Related	35	52	34	34	33	32	37	35	35	35
R43	Non-project Related	35	52	36	34	<30	<30	36	36	36	35
R44-PR	Project Related	35	52	33	31	<30	<30	<35	<35	<35	<35
R45-UNOCC	Unoccupiable	35	N/A	35	33	<30	<30	35	36	36	35
R47-PR	Project Related	35	52	30	<30	<30	<30	<35	<35	<35	<35
R60	Non-project Related	35	52	32	32	30	<30	<35	<35	<35	<35
R61-UNOCC	Unoccupiable	35	N/A	31	32	30	<30	<35	<35	<35	<35
R62-PR	Project Related	35	52	32	32	30	<30	<35	<35	<35	<35
R63	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R64	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R65	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R66	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R67	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R68	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R69	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R70	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R71	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R72	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R73	Non-project Related	35	52	35	34	34	33	38	36	36	36
R74-MOU	Non-project Related - Memorandum of Understan	35	52	34	33	32	31	38	35	35	35
R75	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R76	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R78	Non-project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35
R79-MOU	Non-project Related - Memorandum of Understan	35	52	35	35	34	34	38	36	36	36
R80-MOU	Non-project Related - Memorandum of Understan	35	52	35	35	34	34	38	37	37	37
R81	Non-project Related	35	52	34	33	33	32	37	35	35	35
R82-PR	Project Related	35	52	<30	<30	<30	<30	<35	<35	<35	<35

Appendix 4

Revised Integrated Transport Assessment

prepared by

Constructive Solutions Pty Ltd

(Total No. of pages including blank pages = 106)

This page has intentionally been left blank

Tomingley Gold Extension Project

Integrated Transport Assessment

Prepared for
RW Corkery & Co Pty Ltd

April 2022

Report prepared by Constructive Solutions Pty Ltd

PO Box 1498
TAMWORTH NSW 2340

Phone: 02 6762 1969
Fax: 02 6762 1969
Email: admin@constructivesolutions.com.au

Director: Steve O'Rourke

DOCUMENT HISTORY AND STATUS

Issue	Rev	Issued To	Date	Reviewed	Approved
1	A	M. Bland	14/07/2021		
1	B	S. O'Rourke	03/08/2021	06/8/2021	
1	C	M. Bland	11/08/2021	13/08/2021	
1	D	M. Bland	17/08/2021	19/08/2021	
1	0	M. Bland	23/08/2021	23/8/2021	M. Bloem
1	1	M. Bland	20/12/2021	20/12/2021	M. Bloem
1	2	M. Bland	27/04/2022	27/04/2022	M. Bloem

Author:	Michael Bloem
Project Manager:	Steve O'Rourke
Project Name:	Tomingley Gold Extension Project – Integrated Transport Assessment
Project Number:	2020094
Name of Client:	RW Corkery & Co Pty Ltd

Table of Contents

Commonly Used Acronyms

Abbreviation	Description
AADT	Average Annual Daily Traffic
AUL	Auxiliary Left Turn Lane
AUR	Auxiliary Right Turn Lane
BAL	Basic Left Turn Lane
BAR	Basic Right Turn Lane
CHL	Channelised Left Turn Lane
CHR	Channelised Right Turn Lane
DPIE	Department of Planning, Industry and Environment's
EIS	Environmental Impact Statement
HV	Heavy Vehicle
HW17	Newell Highway
LV	Light Vehicle
NSC	Narromine Shire Council
SEARs	Secretary's Environmental Assessment Requirements
TfNSW	Transport for NSW

1 Introduction

1.1 Overview

Tomingley Gold Operations Pty Ltd (the Applicant), a wholly owned subsidiary of parent company Alkane Resources Ltd (Alkane), operates the Tomingley Gold Operations Mine Site (referred herewith as the TGO Mine Site), located immediately south of the village of Tomingley, approximately 7.5km north of Peak Hill and approximately 38km south of Narromine (refer **Figure 1**). The TGO Mine Site is currently operating under development consent MP09_0155 and the approved activities include the following:

- Mining of four open cuts, with underground mining under three of the approved open cuts, namely Wyoming One, Caloma One and Caloma Two Open Cuts, until 31 December 2025.
- Placement of waste rock into three out-of-pit waste rock emplacements, namely Waste Rock Emplacements 1, 2 and 3 and two in-pit waste rock emplacement, namely the Wyoming 3 and Caloma 2 Open Cuts.
- Construction and use of a carbon-in-leach processing plant and associated infrastructure, including a run-of-mine (ROM) pad, crushing, grinding and leaching circuits, workshops, ablutions facilities, stores, office area and car parking. The maximum approved rate of processing is 1.5 million tonnes per annum (Mtpa).
- Construction and use Residue Storage Facility 1 (to Stage 9 or 286.5m AHD) and Residue Storage Facility 2 (to Stage 2 or 272m AHD) for the storage of process residues.
- Construction and use of infrastructure required for the Mine, including:
    - dewatering ponds;
    - a water pipeline, from a licensed bore located approximately 7km to the east of Narromine;
    - various mine roads, including an underpass beneath the Newell Highway;
    - a transformer and electrical distribution network within the TGO Mine Site;
    - various clean and dirty water management structures; and
    - vegetated amenity bunds.

Construction of the Mine commenced in February 2013 with open cut mining commencing in November 2013. 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.

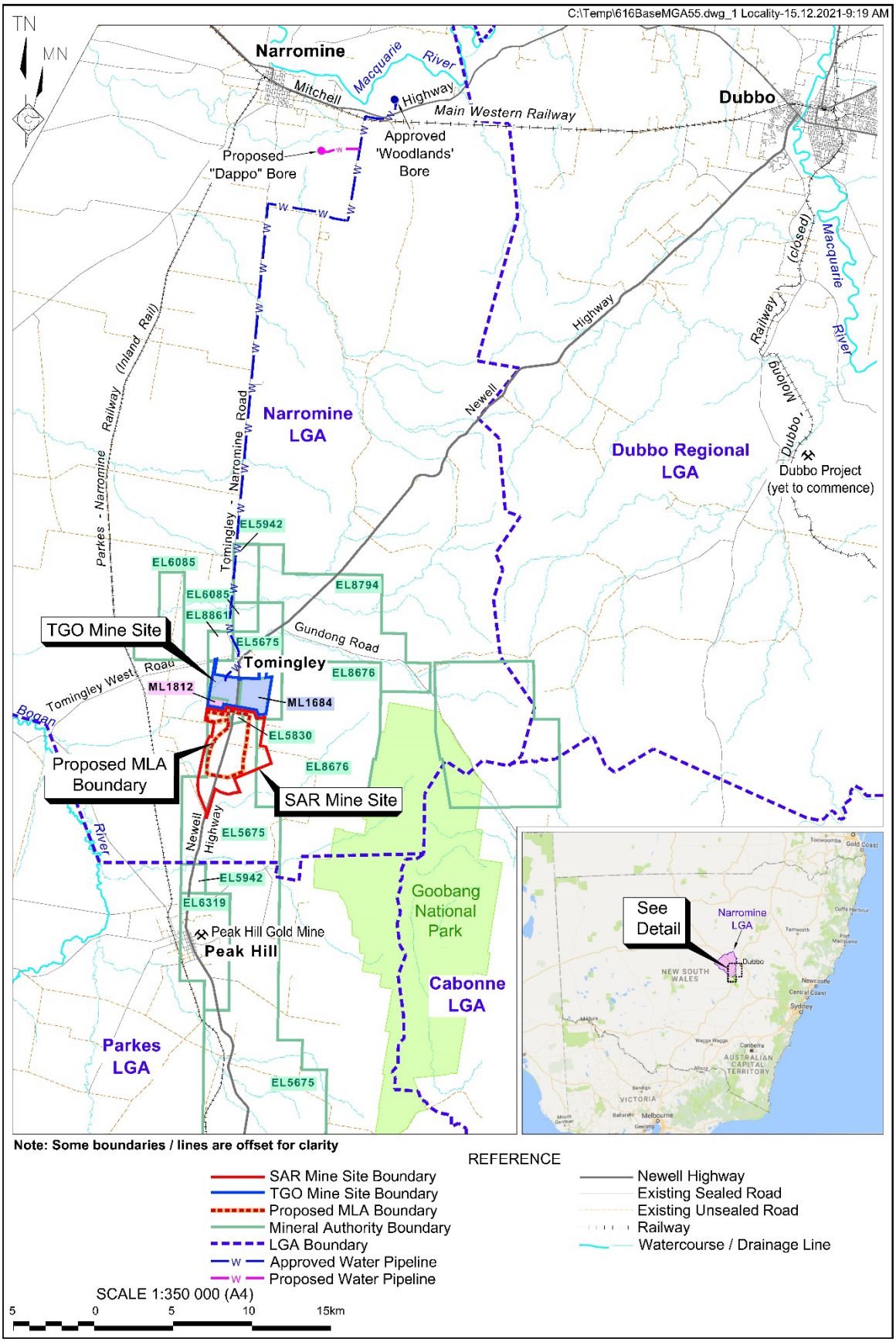


Figure 1 – Locality Plan
(Source: RWC, 2021)

1.2 Project Overview

The Applicant has identified a number of prospects located to the south of the TGO Mine Site, in particular the San Antonio and Roswell (SAR) Prospects, and has completed a preliminary mine optimisation and identified that the resources have the potential to sustain an economically viable mining operation.

The Tomingley Gold Extension Project (the "Project") consists of the TGO Mine Site and the SAR Mine Site, together referred to as the Project Site, shown in **Figure 2**. A full Project description is provided in the Environmental Impact Statement (RWC 2021) and the two components of the Project are as follows:

(1) Approved TGO Mine Site operations. These activities are undertaken in accordance with development consent MP 09_0155. The approved activities would continue under any new development consent, with MP 09_0155 to be surrendered following receipt of the new development consent and all required approvals for the Project. The approved activities include the following.

- Extraction of ore and waste rock from four open cuts, with underground mining beneath three of those open cuts.
- Construction of three out-of-pit waste rock emplacements and two in-pit waste rock emplacements.
- Construction and use of various haul roads, a run-of-mine (ROM) pad and associated stockpiles.
- Construction and use of a Processing Plant to process up to 1.5 million tonnes per annum (Mtpa).
- Construction and use of two residue storage facilities comprising Residue Storage Facility 1 (to Stage 9 or a maximum elevation of 286.5m AHD) and Residue Storage Facility 2 (to Stage 2 or a maximum elevation of 272m AHD).
- Construction and use of ancillary infrastructure.

(2) Proposed SAR Mine Site operations and additional or modified TGO Mine Site operations, including the following:

- Realigned Newell Highway (HW17) and Kyalite Road and associated intersections with Back Tomingley West Road and McNivens Lane and Kyalite Road overpass.
- The SAR Open Cut and Underground Mine.
- Construction of two waste rock emplacements, namely the Caloma Waste Rock Emplacement, within the Caloma 1 and Caloma 2 Open Cuts, and SAR Waste Rock Emplacement, within the southern and central sections of the SAR Open Cut.
- The SAR Amenity Bund, Haul Road and Services Road between the SAR Open Cut and the Caloma 2 Open Cut.
- Minor modifications to the Processing Plant to increase the approved maximum processing rate from 1.5Mtpa to 1.75Mtpa and use of the Plant to process ore from the SAR Open Cut and SAR and TGO underground mining operations.
- Increased capacity for Residue Storage Facility 2, from Stage 2 to Stage 9, with a maximum elevation of 286m AHD).

In addition, the Project would include an extension of the approved mine life, from 31 December 2025 to 31 December 2032.

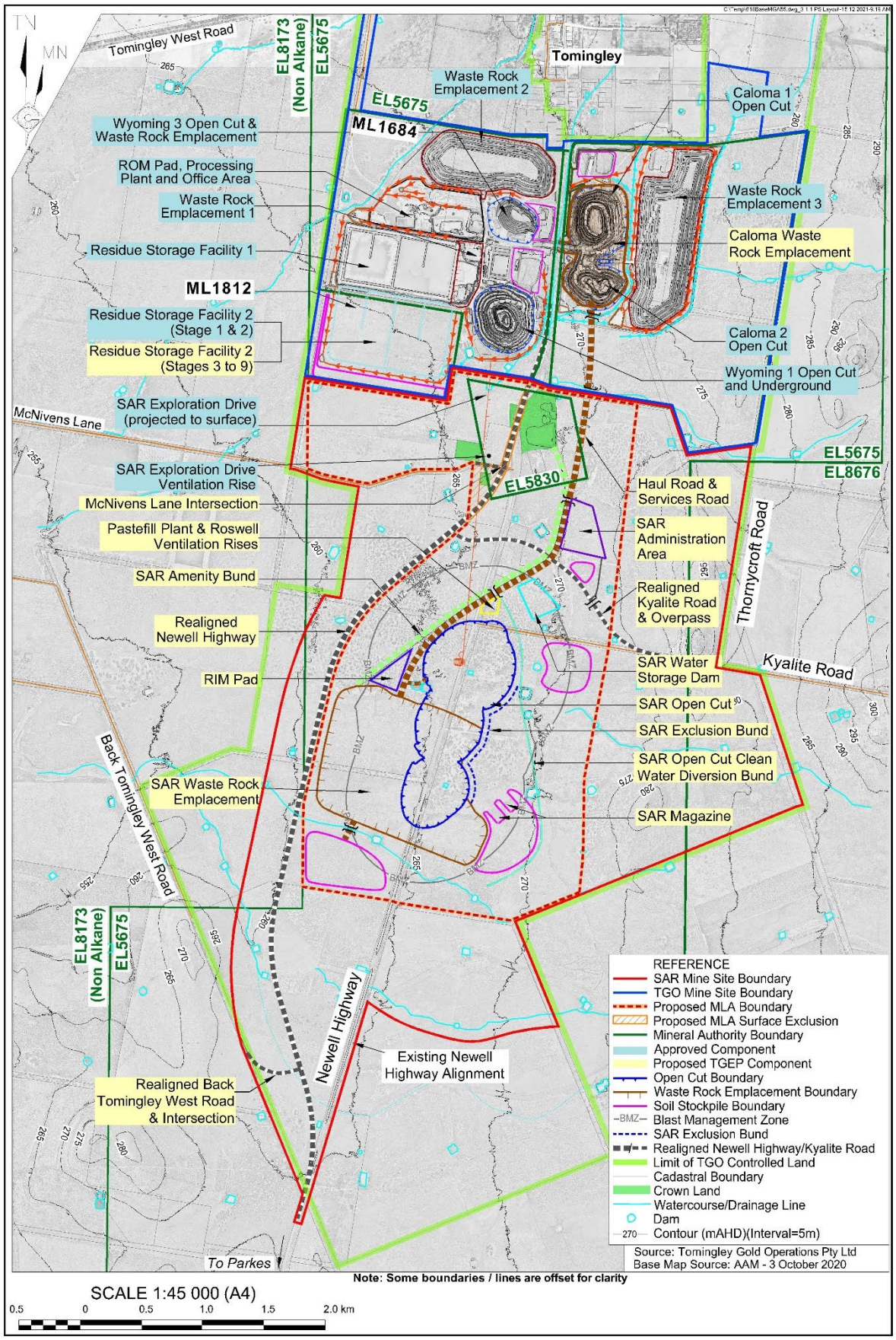


Figure 2 – Project Site Layout

(Source: RWC)

1.3 Scope of this Report

This report has been prepared to accompany an Environmental Impact Statement (EIS) for the Project, prepared by R.W. Corkery & Co. Pty Limited (RWC). This report assesses the transport and traffic related impacts of the Project on the surrounding road network with reference to the following guidelines and standards:

- Guide to Traffic Generating Developments (RTA 2002);
- Road Design Guide (RMS) and Relevant Austroads Standards; and
- Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development.

This assessment has been prepared in accordance with requirements of the NSW Department of Planning, Industry and Environment (DPIE). These were set out in DPIE Secretary's Environmental Assessment Requirements (SEARs) for the Project, issued on 22 July 2021. The SEARs identify matters which must be addressed in the EIS and essentially form its terms of reference. **Table 1** lists individual requirements relevant to this traffic and transport assessment and where they are addressed in this report.

Table 1 – DPIE Road and Transport related SEARs

Description	Report Section
The EIS must address the following specific issues with the level of assessment of likely impacts proportionate to the significance of, or degree, of impact on, the issue, within the context of the project location and the surrounding environment and having regard to applicable NSW Government policies and guidelines, including:	-
• The likely traffic and transport impacts of the development on the capacity, condition, safety and efficiency of the road and rail network and any cumulative impacts of other developments in the locality, documented in an Integrated Transport Assessment, including:	-
- The site access routes (including Newell Highway and Kyalite Road, and associated intersections with Back Tomingley West Road, McNivens Lane and Kyalite Road overpass) and site access points in accordance with the *Roads Act 1993*; and	3.1, 3.2, 4.4, 4.5, 4.6
- A description of the measures that would be implemented to mitigate and / or manage potential traffic impacts including a schedule of all required road upgrades, road maintenance contributions, management of oversized and over mass traffic and other traffic control measures, developed in consultation with the relevant road authority;	4.1.1, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11
• Details of design requirements for the realignment of the Newell Highway and Kyalite Road including associated plans and proposed flood protection of the realigned roads;	4.4, 4.5.1

To inform the preparation of the SEARs, DPIE invited other government agencies to recommend matters to be addressed in the EIS. These matters were taken into account by the Secretary for DPIE when preparing the SEARs and included accordingly.

Narromine Shire Council (NSC) and TfNSW raised matters relevant to the traffic and transport assessment. The matters raised are listed in **Table 2** and **Table 3** and have been taken into account in preparing this assessment.

Table 2 – NSC Project Specific Assessment Requirements

Description	Report Section
Council seeks a traffic and access impact assessment that takes into consideration the following:	-
a) The impact of increased traffic movements, type, and number of vehicle movements on Council's road network;	3
b) The level of service required to facilitate an increased traffic volume as the result of the proposal and if any Council roads will require an update to support the increase in traffic and heavy haulage. This should specifically address some matters specifically referred to in the Scoping Report.	4.5

Description	Report Section
Item No. 1 – 1.5.3 Approved TGO Operations - Any new infrastructure that will cross a Council asset or that may have an impact or interfere on a Council asset will require approval from Council. (e.g. Realignment of roads or water pipelines).	4.5, 4.7, 4.9
Item No. 2 – 1.5.6 Key Mitigation Strategies, 5th Bullet Point - Discussion regarding overpass on Kyalite Road for road users is silent of the design vehicle.	4.5.1
Item No. 3 – 1.5.6 Key Mitigation Strategies - Discussion should include impacts on other roads such as the Newell Highway, Back Tomingley West Road and McNivens Lane.	3, 4.4, 4.5.4, 4.5.5
Item No. 4 – 2.1.2.3 Central West and Orana Regional Plan 2036 – Goal 3 and 2.1.2.4 Narromine Shire Community Strategic Plan – What additional travel time has been calculated for road users along Kyalite Road?	4.5.1
What offset in terms or road serviceability and survivability is being proposed for the other impacted roads? The realigned Kyalite Road should have at least the same AEP as the Newell Highway.	4.5.1
Is there any impact on Thornycroft Road?	4.3.3
Item No. 5 – 2.2.3 Land Ownership - The Applicant will be required to follow the appropriate processes in terms of Road Openings and Road Closures in terms of the Roads Act, 1993.	4.3.5
Item No. 6 – 2.2.6 Risks and Hazards, 2nd bullet point - Consideration should also be given to the realigned Kyalite Road and other impacted roads such as Back Tomingley West Road and McNivens Lane.	4.5
Item No. 7 – 2.2.6 Risks and Hazards - Consideration should be given to the restoration/rehabilitation of re-aligned roads vs doing nothing at end of mine life.	4.5.1
Item No. 8 – 3.4.3 Realigned Public Roads - Overpass on Kyalite Road needs further discussion, especially on the deign vehicle. Council's requirement would be that the overpass be constructed for at least a 36.5m Road Train.	4.5.1
Consideration should be given regarding oversize vehicles, especially agricultural equipment, and the use of the proposed permit system, especially during harvest season or during the movement of stock. Council is not in favour of the permit system, at this stage.	4.1.1
Item No. 9 – General - Stacking and storage of the vehicles need to be considered at intersections considering the design vehicle.	4.6
Item No. 10 – General - Expected traffic movements to the administration area should be outlined.	3.2.3, 3.4
Item No. 11 – General - Road safety audit is sought to be provided as part of the EIS and design phase.	4.3.2

Table 3 – TfNSW Project Specific Assessment Recommendations

Description	Report Section
Discussions are currently occurring in relation to the design requirements for the realignment of the referenced section of the Newell Highway (approximately 1km to the west) and Kyalite Road. The discussions should continue with TfNSW as a part of the preparation of the EIS and any outcome in terms of design should form part of the EIS and associated plans to be submitted as a part of the lodgement of the application with the consent authority.	4.4
Integrated Transport Assessment (ITA) The ITA is to address the following general requirements:	-
Project Schedule - Hours and days of work, number of shifts and start and end times,	3.1.3, 3.2.3
Project Schedule - Phases and stages of the project, including construction, operation and decommissioning,	3
Traffic Volumes - Existing background traffic	3.3
Traffic Volumes - Project-related traffic for each phase or stage of the project	3.4

Description	Report Section
Traffic Volumes - Projected cumulative traffic at commencement of operation, and a 10-year horizon post-commencement	3.4, 3.5
Traffic Characteristics - Number and ratio of heavy vehicles to light vehicles	3
Traffic Characteristics - Peak times for existing traffic	3
Traffic Characteristics - Peak times for project-related traffic including commuter periods	3
Traffic Characteristics - Proposed hours for transportation and haulage	3.1.3, 3.2.3
Traffic Characteristics - Interactions between existing and project-related traffic	3
A description of all over size and over mass vehicles and the materials to be transported	4.1.1
The origins, destinations and routes for commuter (employee and contractor) light vehicles and pool vehicles	3
The origins, destinations and routes for heavy (haulage) vehicles	3
The origins, destinations and routes for over size and over mass vehicles:	3
Road safety assessment of key haulage route/s,	-
The impact of traffic generation on the public road network and measures employed to ensure traffic efficiency and road safety during construction, operation and decommissioning of the project	3
The need for improvements to the road network, and the improvements proposed such as road widening and intersection treatments, to cater for and mitigate the impact of project related traffic	4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11
Proposed road facilities, access and intersection treatments are to be identified and be in accordance with Austroads Guide to Road Design including provision of Safe Intersection Sight Distance (SISD)	4.6
Local climate conditions that may affect road safety during the life of the project (e.g. fog, wet and dry weather, icy road conditions)	4.13
The layout of the internal road network, parking facilities and infrastructure	4.20
Impacts on rail corridors and level crossings including rail and road traffic, and detailing any proposed interface treatments	4.17
Impact on public transport (public and school bus routes) and consideration for active transport modes such as walking and cycling	2.5, 2.6, 4.15, 4.16
Identification and assessment of potential impacts of the project, such as blasting, lighting, visual, noise, dust and drainage on the function and integrity of all affected public roads	4.14
Controls for transport and use of any dangerous goods in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development, the Australian Dangerous Goods Code and Australian Standard 4452 Storage and Handling of Toxic Substances	3.2.6

2 The Surrounding Road Network

2.1 The Study Area

An inspection of the roads in the vicinity of the Project Site was conducted on 6 November 2020. The roads included in the study are described in **Table 4** and shown in **Figure 3.**

Table 4 – Inspected Roads within the Study Area

Road Name	Inspection Extent	Approx. Length
Newell Highway	Back Tomingley West Road to Tomingley Road	10.2km
Tomingley Road[1]	Newell Highway to Tomingley West Road	0.22km
Tomingley West Road	Tomingley Road to Back Tomingley West Road	4.4km
Back Tomingley West Road	Tomingley West Road to the Newell Highway	10.4km
Kyalite Road	Newell Highway to O'Leary's Lane	5.8km
Thorncroft Road	Kyalite Road to 90 degree bend	1.6km
McNivens Lane[2]	Newell Highway to Back Tomingley West Road	4.5km

Access to the TGO Mine Site is currently from Tomingley West Road. Traffic travelling to the TGO Mine Site from Dubbo to the north-east and Peak Hill to the south will use the Newell Highway, Tomingley Road and Tomingley West Road, whilst traffic originating from Narromine to the north use Tomingley Road and Tomingley West Road.

The Newell Highway is a state road controlled by TfNSW. All other local roads as listed above are located within the Narromine Shire Council (NSC) Local Government Area (LGA) with NSC as the road authority.

[1] Tomingley Road is also referred to as the Tomingley-Narromine Road.
[2] Whilst signposted McNivens Lane, it is also referred to as McNivens Lane.

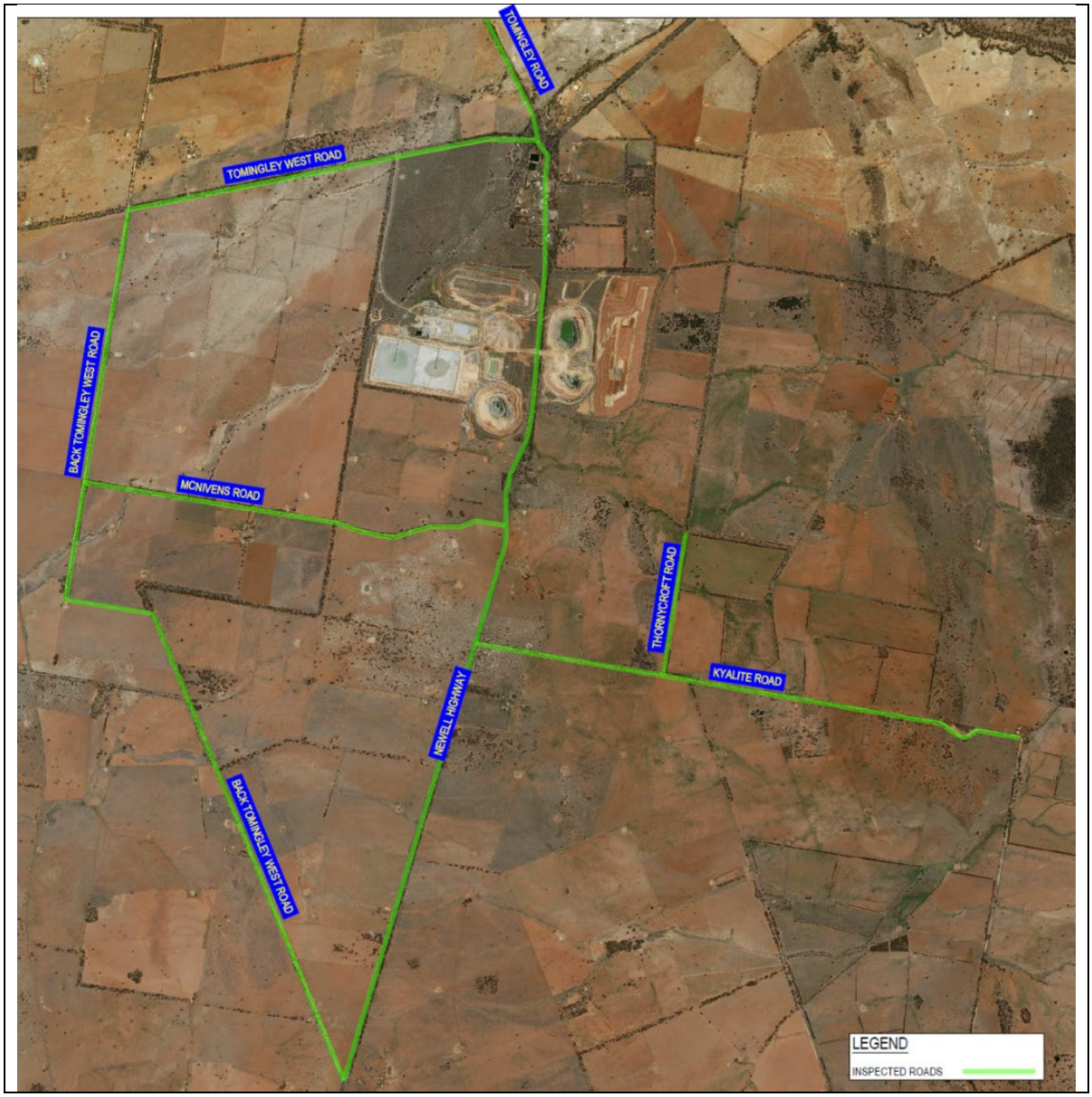


Figure 3 – Surrounding Road Network

2.2 Roads

2.2.1 Newell Highway (HW17)

The Newell Highway forms part of the National Highway network and is a classified road (state road) referred to as Highway 17 (HW17). HW17 is approximately 1,060km in length and provides a link from the Murray River at Tocumwal at the Victoria border through to the Queensland border at Goondiwindi and is a major interstate transport connection between Victoria, New South Wales and Queensland for freight and passengers, including tourists. In addition, HW17 provides a significant regional traffic route serving and linking a range of towns and major centres as well as link for domestic and export markets.

For the purpose of this assessment, HW17 was inspected from its intersection with Back Tomingley West Road to the south of the Project Site to its intersection with Tomingley Road to the north of the Project Site as described below.

In the vicinity of the Project Site, HW17 is generally flat with long, straight sections. The road configuration generally consists of a two-lane / two-way sealed road with 3.5m wide travel lanes and 1.5m sealed shoulders (refer **Plate 1**). The posted speed limit is 110km/h except for the northern and southern approaches to the village of Tomingley where the posted speed limit reduces to 80km/h before reducing to 50km/h within the village (refer **Plate 2**). HW17 travels in a north-south direction in the vicinity of the Project Site and is identified as approved for restricted access vehicles including 25 and 26m long B-doubles, and double road trains as per the TfNSW online interactive Restricted Access Vehicle Maps [3]. The pavement was considered to be in relatively good condition. Delineation consisted of guideposts, retroreflective raised pavement markers (RRPMs), centre and edge line markings. There are also a number of rural property access points that intersect with HW17 between the TGO Mine Site and Back Tomingley West Road.

Plate 1: Typical section of HW17 south of Tomingley

Plate 2: Typical section of HW17 through the village of Tomingley

2.2.2 Tomingley Road

Tomingley Road is a classified road referred to as Main Road 89 (MR89) that provides an important link from HW17 to the Mitchell Highway at Narromine. It also provides access to numerous rural properties and the TGO Mine Site from HW17. For the purpose of this assessment, a 220m long section of Tomingley Road from HW17 to the intersection of Tomingley West Road was inspected as described below. It is approved for restricted access vehicles including 25 and 26m long B-doubles, and double road trains as per the TfNSW online interactive Restricted Access Vehicle Maps.

The configuration of this section of the road consists of a two-lane / two-way sealed road with 3.1m wide travel lanes and 1m wide sealed shoulders (refer **Plate 3**). The posted speed limit is 80km/h. The pavement was considered to be in relatively good condition. Delineation consisted of guideposts, centre and edge line markings.

[3] https://roads-waterways.transport.nsw.gov.au/business-industry/heavy-vehicles/maps/road-train-map/index.html (09/06/2021)

Plate 3: Tomingley Road looking south back to HW17

2.2.3 Tomingley West Road

Tomingley West Road is local road that provides access to numerous rural properties and direct access to the existing TGO Mine Site. Tomingley West Road travels in an east-west direction adjacent to the TGO Mine Site to the south. The posted speed limit is 60km/h from its intersection with Tomingley Road before increasing to 100km/h. To the west of the TGO Mine Site access, the speed limit was signposted with an 80km/h Road Work speed sign. For the purpose of this assessment, Tomingley West Road was inspected for a distance of approximately 4.4km from its intersection with Tomingley Road to its intersection with Back Tomingley West Road as described below.

The TGO Mine Site access is located approximately 1.5km from the Tomingley Road intersection. The configuration of Tomingley West Road in this consists of a two-lane / two-way sealed road with 3.5m wide travel lanes and 0.5m wide sealed shoulders (refer **Plate 4** and **Plate 5**). The pavement was considered to be in relatively good condition. Delineation constated of guideposts, centre and edge line markings however these markings had faded in places.

Plate 4: Tomingley West Road looking west from the Tomingley Road intersection

Plate 5: Typical section of Tomingley West Road looking east

The remaining 2.9km of Tomingley West Road from the TGO Mine Site access to the Back Tomingley West Road consists of a 3.4m wide seal with unsealed shoulders of between 1 and 1.5m wide (refer **Plate 6** and **Plate 7**). The road caters for two way traffic and the pavement was considered to be in relatively good condition however, there were no guideposts for delineation at night.

Plate 6: Tomingley West Road looking west from the TGO Mine Site access intersection

Plate 7: Tomingley West Road looking east from the Back Tomingley West Road intersection

2.2.4 Back Tomingley West Road

Back Tomingley West Road is local road that provides access to numerous rural properties. Back Tomingley West Road effectively travels in a north-south direction and is located to west of the Project Site. Back Tomingley West Road was inspected for a distance of approximately 10.5km from its intersection with Tomingley West Road to its intersection with HW17 as described below.

Back Tomingley West Road is an unsealed road with an average pavement width of approximately 6m that caters for two way traffic (refer **Plate 8** and **Plate 9**). There is no posted speed limit however, the default speed limit is 100km/h. The pavement was considered to be in fair to reasonable condition however there were a number of soft spots encountered due to poor drainage provisions and there were no guideposts for delineation at night.

Plate 8: Back Tomingley West Road – Typical Section for ch5km from the Tomingley West Road intersection

Plate 9: Typical section of Back Tomingley West Road from approximately ch5km to HW17

2.2.5 Kyalite Road

Kyalite Road is local road that provides access to numerous rural properties. Kyalite Road travels in an east-west direction and is located to the east of HW17. Kyalite Road was inspected for a distance of approximately 9.5km from its intersection with HW17 to O'Leary's Lane as described below.

Kyalite Road is an unsealed road with an average pavement width of approximately 6m that caters for two way traffic (refer **Plate 10** and **Plate 11**). There is no posted speed limit however, the default speed limit is 100km/h. The pavement was considered to be in reasonable condition however there were no guideposts for delineation at night.

Where Kyalite Road intersects with Thornycroft Road, there is a crest to the west along Kyalite Road which results in limited sight distance for road users. There is also no crest signage in place (refer **Plate 12**).

Plate 10: Kyalite Road – Typical Section between HW17 and Thornycroft Road

Plate 11: Kyalite Road – Typical Section between Thornycroft Road and O'Learys Lane

Plate 12: Kyalite Road – looking west from the Thornycroft Road intersection

2.2.6 Thornycroft Road

Thornycroft Road is local road that provides access to numerous rural properties. Thornycroft Road travels in a north-south direction, before turning east west and is located to the east of HW17. Thornycroft Road was inspected for a distance of approximately 1.6km from its intersection with Kyalite Road as described below.

Thorncroft Road is an unsealed road with an average pavement width of approximately 4.5m that caters for two way traffic (refer **Plate 13** and **Plate 14**). There is no posted speed limit however, the default speed limit is 100km/h. The pavement was considered to be in reasonable condition however there were no guideposts for delineation at night.

Plate 13: Thornycroft Road – Typical Section looking north from the Kyalite Road intersection

Plate 14: Thornycroft Road – Typical Section looking south from ch1.6km at the bend

2.2.7 McNivens Lane

McNivens Lane is a local road that is located to the south of the TGO Mine Site. McNivens Lane travels in an east-west direction and is located to the west of HW17. McNivens Lane was inspected for a distance of approximately 4.5km from its intersection with HW17 through to Back Tomingley West Road as described below.

McNivens Lane is an unsealed road with an average pavement width of approximately 3.5m that caters for two way traffic (refer **Plate 15** and **Plate 16**). There is no posted speed limit however, the default speed limit is 100km/h. The pavement was considered to be in fair reasonable condition however there were a number of soft sports and there were no guideposts for delineation at night.

McNivens Lane crosses Gundoong Creek approximately 500m east of the Back Tomingley West Road intersection. There is a gravel causeway in place however this section of the road is commonly underwater for extended periods of time as the opportunity for flood waters to dissipate in this area is limited given the flat terrain. **Plate 17** is an example of the flooding that occurred at this location back in August 2020.

Plate 15: McNivens Lane – Typical Section looking west from the HW17 intersection

Plate 16: McNivens Lane – Typical Section looking east from the Back Tomingley West Road intersection

Plate 17: McNivens Lane – Gundong Creek crossing

2.3 Intersections

2.3.1 HW17 and Tomingley Road

The intersection of HW17 and Tomingley Road is a T-intersection inclusive of an Auxiliary Right (AUR) and Auxiliary Left (AUL) turn treatments on HW17. HW17 is the priority road and signposted give way control is in place for Tomingley Road inclusive of a sightboard which is appropriately located opposite the Tomingley Road approach to the intersection. In addition, a median island is in place along the centre line of Tomingley Road to prevent vehicles cutting the corner when undertaking right turn manoeuvres. The posted speed limit is 60km/h for all legs of the intersection, the pavement was considered to be in relatively good condition and delineation was provided in the form of guideposts, line marking, RRPMs and overhead street lighting. (refer **Plate 18** to **Plate 20**).

Plate 18: HW17 – view north from Tomingley Road

Plate 19: HW17 – view south from Tomingley Road

Plate 20: View east on approach from Tomingley Road to HW17

2.3.2 Tomingley Road and Tomingley West Road

The intersection of Tomingley Road and Tomingley West Road is a T-intersection inclusive of a Basic Right (BAR) turn treatment on Tomingley Road. Tomingley Road is the priority road with give way control (no sign posts) in place for Tomingley West Road inclusive of a sightboard which is appropriately located opposite the Tomingley West Road approach to the intersection. The posted speed limit is 80km/h for all legs of the intersection, the pavement was considered to be in relatively good condition and delineation was provided in the form of guideposts and line marking. (refer **Plate 21** to **Plate 23**).

Plate 21: Tomingley Road – view south-east from the Tomingley West Road intersection

Plate 22: Tomingley Road – view north-west from the Tomingley West Road intersection

Plate 23: View east on approach from Tomingley West Road to Tomingley Road

2.3.3 Tomingley West Road and the Existing TGO Mine Site Access

The intersection of Tomingley West Road and the existing TGO Mine Site access is a rural property access which is sealed and is wide enough to cater for two way traffic movements. Stop control is in place for the access road inclusive of a sightboard which is appropriately located opposite the TGO Mine Site access to the intersection. In addition, the Applicant has also introduced a 40km/h speed limit for the access road whilst Tomingley West Road has a speed limit of 100km/h at this location. The pavement was considered to be in relatively good condition and delineation was provided in the form of guideposts and line marking however, the line marking at this location was faded. (refer **Plate 24** to **Plate 26**).

Plate 24: Tomingley West Road – view west from the TGO Mine Site access

Plate 25: Tomingley West Road – view east from the TGO Mine Site access

Plate 26 – View north on approach to Tomingley West Road from the TGO Mine Site access

2.3.4 Tomingley West Road and Back Tomingley West Road

The intersection of Tomingley West Road and Back Tomingley West Road is a 4 way intersection. Tomingley West Road is the priority road with signposted give way control in place for Back Tomingley West Road to the south and Lovers Lane to the north. There is no posted speed limit however, the default speed limit for all legs of the intersection would be 100km/h. (refer **Plate 27** to **Plate 30**).

Plate 27: Tomingley West Road – view west from Back Tomingley West Road

Plate 28: Tomingley West Road – view east from Back Tomingley West Road

Plate 29: Lovers Lane – view north from Tomingley West Road

Plate 30: Back Tomingley West Road – view south from Tomingley West Road

2.3.5 Back Tomingley West Road and McNivens Lane

The intersection of Back Tomingley West Road and McNivens Lane is a basic rural T-intersection with all legs consisting of an unsealed gravel pavement. Back Tomingley West Road is the priority road with give way control (no sign posts) in place for McNivens Lane. There is no sightboard located opposite the McNivens Lane approach to the intersection and no delineation. (refer **Plate 31** to **Plate 33**).

Plate 31: Back Tomingley West Road – view north from McNivens Lane

Plate 32: Back Tomingley West Road – view south from McNivens Lane

Plate 33: View west on approach from McNivens Lane to Back Tomingley West Road

2.3.6 HW17 and Back Tomingley West Road

The intersection of HW17 and Back Tomingley West Road is a T-intersection with HW17 as the priority road. Signposted give way control is in place for Back Tomingley West Road inclusive of a sightboard which is appropriately located opposite the Back Tomingley West Road approach to the intersection. The posted speed limit for HW17 is 110km/h and includes a 1.0m wide centre line treatment. The sight distance in both directions along HW17 is greater than 300m and there are no turn treatments in place on HW17. The pavement was considered to be in relatively good condition and delineation was provided in the form of guideposts, RRPMs and line marking (refer **Plate 324** to **Plate 36**).

Plate 34: HW17 – view south from Back Tomingley West Road

Plate 35: HW17 – view north from Back Tomingley West Road

Plate 36 - View east on approach from Back Tomingley West Road to HW17

2.3.7 HW17 and Kyalite Road

The intersection of HW17 and Kyalite Road is a T-intersection with HW17 as the priority road. Signposted give way control is in place for Kyalite Road inclusive of a sightboard which is appropriately located opposite the Kyalite Road approach to the intersection. The posted speed limit for HW17 is 110km/h, the sight distance in both directions along HW17 is greater than 300m. There are no turn treatments in place along HW17. The pavement was considered to be in relatively good condition and delineation was provided in the form of guideposts, RRPMs and line marking (refer **Plate 37** to **Plate 39**).

Plate 37: HW17 – view south from Kyalite Road

Plate 38: HW17 – view north from Kyalite Road

Plate 39: View west on approach from Kyalite Road to HW17

2.3.8 HW17 and McNivens Lane

The intersection of HW17 and McNivens Lane is a T-intersection with HW17 as the priority road. Signposted give way control is in place for Kyalite Road inclusive of a sightboard which is appropriately located opposite the McNivens Lane approach to the intersection. The posted speed limit for HW17 is 110km/h and the sight distance in both directions along HW17 is greater than 300m. There are no turn treatments in place along HW17. The pavement was considered to be in relatively good condition and delineation was provided in the form of guideposts, RRPMs and line marking (refer **Plate 40** to **Plate 42**).

Plate 40: HW17 – view south from McNivens Lane

Plate 41: HW17 – view north from McNivens Lane

Plate 42: View east on approach from McNivens Lane to HW17

2.3.9 Kyalite Road and Thornycroft Road

The intersection of Kyalite Road and Thornycroft Road is a basic rural T-intersection with all legs consisting of an unsealed gravel pavement. Kyalite Road is the priority road with give way control (no sign posts) in place for Thornycroft Road. There is no sightboard located opposite the Thornycroft Road approach to the intersection and no delineation. (refer **Plate 43** to **Plate 45**).

Plate 43: Kyalite Road – view west from Thornycroft Road

Plate 44: Kyalite Road – view east from Thornycroft Road

Plate 45: View south on approach from Thornycroft Road to Kyalite Road

2.4 Traffic Volumes

2.4.1 Existing Traffic Volumes

Table 5 details the 2020 traffic volumes of the roads to be assessed for the Project as annual average daily traffic (AADT) and percentage of heavy vehicles (%HV). Copies of available traffic count reports are included in **APPENDIX 1.**

Table 5 – Existing Traffic Volumes

Road	Traffic Counter Location	Existing Traffic (2020)	
		AADT	HV%
HW17(1)	Between Kyalite Road and Back Tomingley West Road	2224	44.8
Back Tomingley West Road(1)	Approximately 100m on the approach to HW17	17	9.8
Kyalite Road(2)	Approximately 100m on the approach to HW17	22	41.3
McNivens Lane(3)	-	15	10

Note (1) – 2 week period from 19August 2020 to 1 September 2020

Note (2) – 13 week period from 1 November 2019 to 24 January 2020.

Note (3) – Assumed existing traffic volume given traffic is considered to be less than Kyalite Road as evidenced by its length and the number of properties serviced.

Weekday peak hour traffic on HW17 (2020) occurs as follows:

- AM Peak: 10:00am – 11:00am at 162 vehicles per hour (vph); and
- PM Peak: 3:30pm – 4:30pm at 168 vph.

2.5 Bus Services

There are several bus services that operate adjacent to the Project Site as indicated in **Table 6**. Details of the services were obtained from private bus operators and the Transport for NSW website[4].

Table 6 – Bus Services

Type	Road Name	When	No. of Services	Service Provider	Stop Locations
School Bus	HW17	Weekdays	AM x 3 PM x 3	1. Tony Witts 2. Dubbo Buslines 3. Parker, GJ & AF	Various – informal
School Bus	Tomingley Road	Weekdays	AM x 2 PM x 2	1. Tony Witts 2. Parker, GJ & AF	Various – informal
School Bus	Tomingley West Road	Weekdays	AM x 2 PM x 2	1. Tony Witts 2. Parker, GJ & AF	Various – informal
School Bus	Back Tomingley West Road	Weekdays	AM x 1 PM x 1	Parker, GJ & AF	Various – informal
School Bus	Kyalite Road	Weekdays	AM x 1 PM x 1	Parker, GJ & AF	Various – informal

[4] https://transportnsw.info

Type	Road Name	When	No. of Services	Service Provider	Stop Locations
Coach Service[1]	HW17	Every day except Friday	8:47am[2] 6:12pm[3]	Transport for NSW	Tomingley Coach Stop
Note (1) – Coach service between Cootamundra and Dubbo Note (2) – Monday, Wednesday, Saturday Note (3) – Tuesday, Thursday, Sunday					

2.6 Pedestrian and Cyclist Activity

No pedestrians or cyclists were observed during the inspections on the local roads and only a very small number of pedestrians were observed on HW17 adjacent to the rest area in the 50km/h speed zone within the village of Tomingley.

2.7 Crash History

Crash data from the NSW Government Centre for Road Safety Interactive Crashes website[5] was used to assess the crash history in the vicinity of the Project Site. Four crashes were reported on HW17 in the vicinity of the Project Site and no crashes have been recorded on the other roads inspected within the study area.

The crash data for HW17 is summarized in **Table 7**. Refer **APPENDIX 2** for the maps of the crash sites and refer to the website for more detailed information.

Table 7 – HW17 Crash Data

Year	Crash ID	Location	Accident Type	Degree of Crash	Day or Night	No. Injured
2019	1224254	South of Tomingley Road Intersection	Other Manoeuvring	Moderate Injury	Night	1
2019	1221952	North of McNivens Lane	Left off carriageway into object / parked vehicle	Moderate Injury	Day	2
2016	1123718	South of Kyalite Road Intersection	Off carriageway to right	Serious Injury	Day	2
2018	1166654	South of Back Tomingley West Road Intersection	Left off carriageway into object / parked vehicle	Moderate Injury	Night	1

The number of crashes reported is minor given the volume of traffic using HW17 in the vicinity of the Project Site. No repetitive or reoccurring accident patterns were identified and it is therefore considered that the reported crash history in the vicinity of the Project Site does not indicate any areas of concern within the road network.

[5] https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats/lga_stats.html?tablga=4 (20/07/2021)

3 Project Related Traffic

3.1 Construction Phase

Road realignment construction activities are anticipated to commence in the middle of Year 0 (2022) and take 7 months to complete whilst SAR Mine Site construction activities are anticipated to commence in Year 0 and take a similar time to complete. The SAR Mine Site construction activities would continue in parallel with construction of HW17 and Kyalite Road (including the overpass) and after these have been completed and the existing roads closed. During the construction phase, access for construction workers to nominated construction site compounds are proposed as follows and shown in **Figure 4**.

3.1.1 Road Construction Compound Area

Road construction worker site access is proposed to be west of the existing HW17 Alignment as follows:

- **Proposed Entry and Light Vehicle Exit Point** - via the existing "Kenilworth" property access on HW17. It is proposed that this access would be temporarily upgraded to include a Channelised Right (CHR) turn treatment for workers travelling from the north of the Project Site and a Basic Left (BAL) turn treatment for workers travelling from the south of the Project Site;
- **Proposed Heavy Vehicle Exit Point 1** - via a temporary site access from McNivens Lane in the vicinity of the alignment of the proposed HW17 realignment. Vehicles would use the existing HW17 and McNivens Lane intersection;
- **Proposed Heavy Vehicle Exit Point 2** - via a temporary site access from Back Tomingley West Road in the vicinity of the alignment of the proposed HW17 realignment. Vehicles would use the existing HW17 and Back Tomingley West Road intersection.

For construction associated with the realignment of Kyalite Road (including the overpass), construction workers travelling northbound along HW17 would be prevented from turning right in the existing Kyalite Road intersection. This requirement would be reinforced by the use of appropriate roadside signage as well ongoing notification to workers during the construction phase. Workers travelling from the south would continue through to the village of Tomingley and turn right into the existing truck stop rest area before travelling back south along HW17 and then turning left into the existing Kyalite Road intersection.

3.1.2 SAR Mine Site Construction Compound Area

The proposed entry and exit point for mine construction workers is via a temporary site access from the existing Kyalite Road alignment within the footprint to the SAR Open Cut. Vehicles would use the existing HW17 and Kyalite Road intersection.

At the completion of the realignments of HW17 and Kyalite Road (including the overpass) and the associated closure of existing roads, vehicles associated with ongoing SAR Mine Site construction activities would use the new realigned sections of HW17 and Kyalite Road and the new SAR Mine Site access road.

3.1.3 Construction Traffic

Road construction and mine construction activities are proposed to be undertaken during the following working hours:

- Monday to Saturday 7:00am to 10:00pm;and
- No work on Sunday or public holidays.

Estimates of traffic generated by the Project were provided by the Applicant who anticipates that the majority of construction traffic would approach the construction site compound areas from the north. It has therefore been estimated that approximately 80% of the construction workforce traffic will originate

from the north (Dubbo and Narromine) and approximately 20% will originate from the south (Peak Hill and Parkes).

Details of construction traffic levels for the road realignments and SAR Mine Site construction have been provided by the Applicant and are detailed in **Table 8.**

Table 8 – Construction Traffic Levels

	LV	HV
Road Construction Site Compound		
Typical Daily Movements(1)	100	6
Estimated Maximum Daily Movements(1)	120	120
SAR Mine Site Construction Site Compound		
Typical Daily Movements(1)	120	6
Estimated Maximum Daily Movements(1)	170	60
Note (1): Two vehicle movements = one return trip		

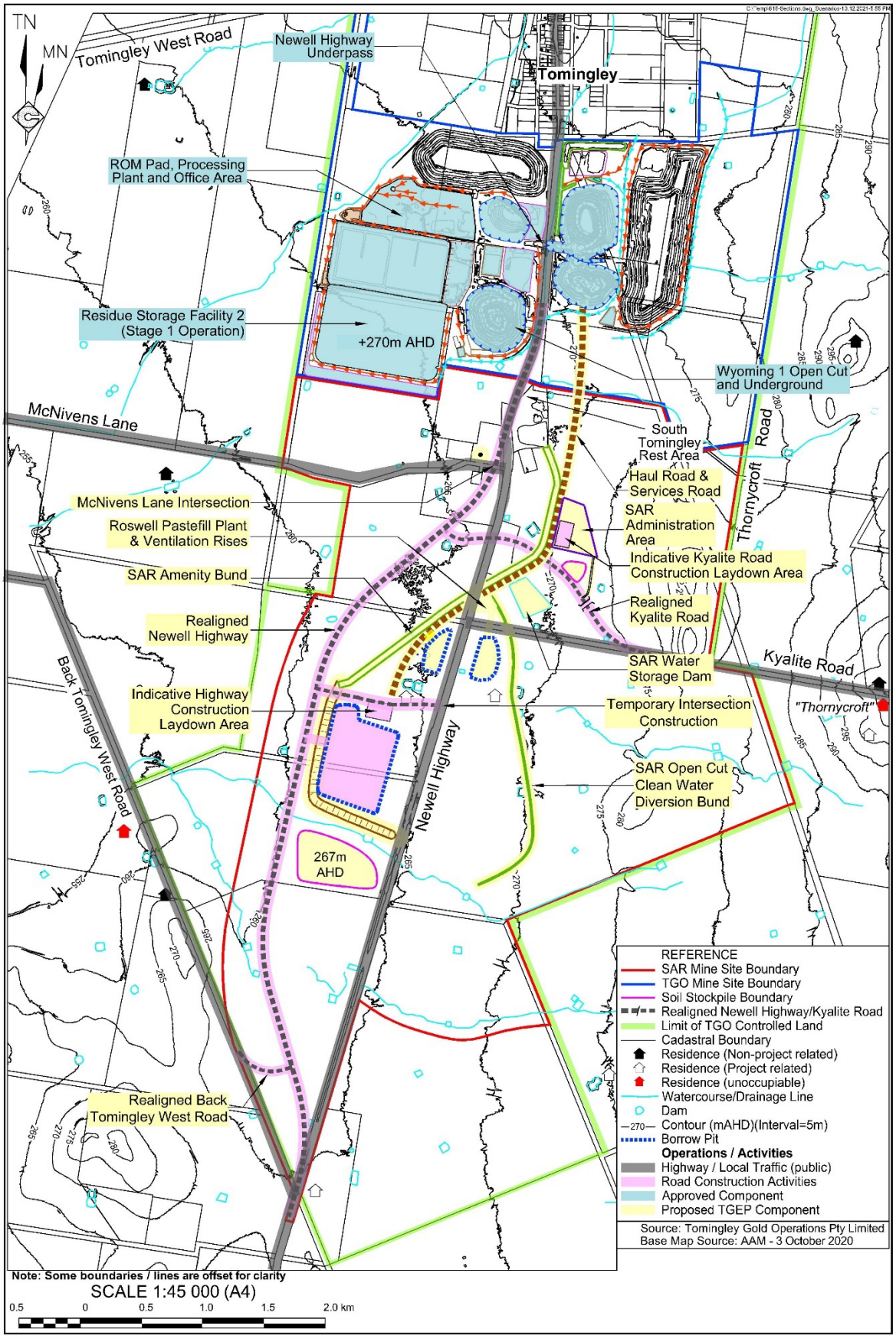


Figure 4 – Construction Site Compound Locations

(Source: RWC, 2021)

3.2 Operational Traffic

3.2.1 TGO Mine Site – Site Access

Operational traffic levels associated with the ongoing operation at the TGO Mine Site should be largely unchanged from the existing traffic levels of 146 light vehicles (LV) and 12 heavy vehicles (HV) as advised by the Applicant. The Applicant has advised that it is anticipated that there would be up to an additional 10 LV traffic movements per day between the TGO Mine Site and the SAR Mine Site. **Table 9** presents the anticipated TGO mine site operational traffic levels using the existing access to the TGO Mine Site off Tomingley West Road as described in **Section 2.3.3**.

Table 9 – TGO Mine Site Operational Traffic Levels

	LV	HV
Daily Movements(1)	156	12
Note (1): Two vehicle movements = one return trip		

3.2.2 TGO Mine Site – Mine Transportation Operations

The existing TGO Mine Site transportation operations will effectively remain unchanged as a result of the Project.

3.2.3 SAR Mine Site – Site Access

During mining operations at the SAR Mine Site, the majority of personnel, consumables and equipment would access the SAR Mine Site via HW17, the realigned Kyalite Road and the new SAR Site Access Road. **Table 10** presents the anticipated SAR Mine Site operational traffic levels as provided by the Applicant.

Table 10 – SAR Mine Site Operational Traffic Levels

	LV	HV
Average Daily Movements(1)	100	6
Maximum Daily Movements(1) (Indicative only)	240	8
Note 1: Two vehicle movements = one return trip.		

For the purposes of this Integrated Traffic Assessment, the operational phase of the Project begins from commissioning of the realigned HW17 and Kyalite Road and associated decommissioning of the existing sections of those roads, expected during the 2023/2024 Financial Year. Operations anticipated to finish by 31 December 2032.

Full scale mining and processing operations would operate 24 hours, 7 days per week with two 12 hour shifts changing over at 6:00am and 6:00pm respectively. Operational shift personnel will work a rotating even time roster with 4 panels of workers.

Office based administrative personnel will generally work a day shift from 7:30am to 4:00pm, Monday to Friday.

Operational and administrative personnel are expected to travel to the SAR Mine site in private LVs during normal operations and it has been assumed that 80% of operational and administrative personnel traffic will originate from the north (Dubbo and Narromine) and 20% will originate from the south (Parkes and Peak Hill).

All material extracted from the SAR Open Cut will be transported and processed on-site and as a result there will be no off site HV haulage of ore.

The directional origin of deliveries and visitors is anticipated to be the same as operational and administrative personnel at 80% from the north and 20% from the south.

3.2.4 SAR Mine Site – Internal Road and Parking Infrastructure

The internal road network including parking provisions for workers within the SAR Mine Site is shown in **Figure 5**. Details of access to the SAR Mine Site have been provided in **Section 4.8** and **Section 4.9**.

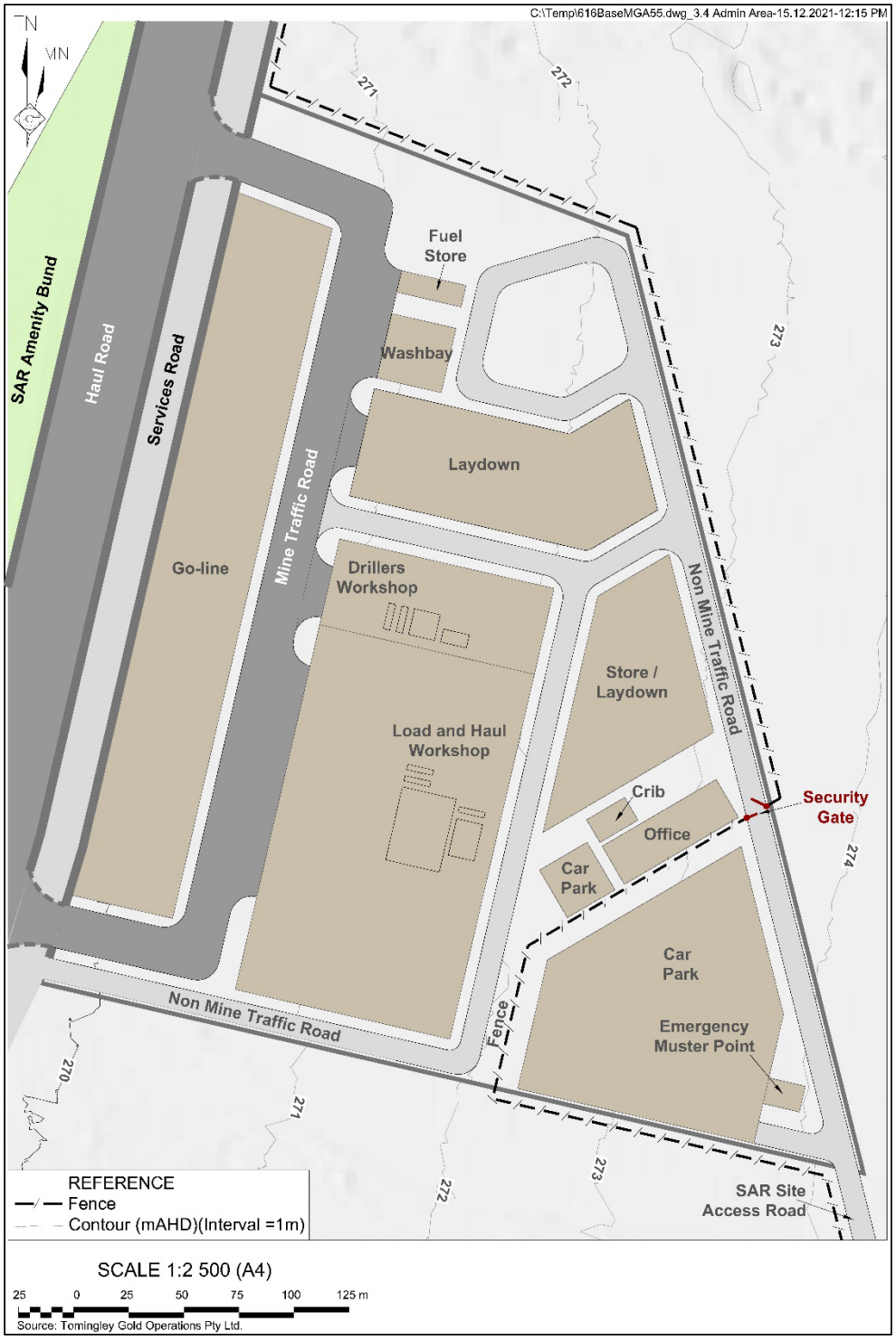


Figure 5 – SAR Mine Internal Road and Parking Infrastructure

(Source: RWC, 2021)

3.2.5 SAR Mine Site – Mine Transportation Operations

A Haul Road and Services Road would be constructed between the Caloma 2 and SAR Open Cuts as shown in **Figure 2**. The Haul Road would permit surface haul trucks to transport ore and waste rock from the SAR Open Cut to the TGO Mine Site. The road would be sufficiently wide to permit two-way use by haul trucks travelling in opposite directions. Ore would be transported to the ROM Pad via the existing HW17 underpass. Waste rock would be placed within the Caloma and Caloma 2 Open Cuts.

A Services Road would be constructed adjacent to the Haul Road and would permit use by road-registerable vehicles, including LVs, service vehicles and HVs. The Services Road would be sufficiently wide to permit two-way use by vehicles travelling in opposite directions. The Services Road would be separated from the Haul Road by a bund that would prevent vehicles crossing between the two roads.

Where the Haul Road and Services Road cross the proposed Kyalite Road realignment, an overpass for Kyalite Road would be constructed. Further information regarding the proposed Kyalite Road realignment and overpass are presented in **Section 4.5.1**.

All material extracted from the SAR Open Cut will be transported and processed on-site and as a result there will be no off site HV haulage of ore.

3.2.6 SAR Mine Site –Transportation of Dangerous Goods

The only dangerous goods to be transported to the SAR Mine site will be diesel and explosives. It is anticipated that frequency of deliveries of diesel and explosive will occur multiple times per week.

3.3 Traffic Data

3.3.1 Current and Forecast Traffic Volumes

The estimated forecast traffic volumes for all roads for the construction phase (Year 0) and expected 10 year Project life (Year 2032) have been calculated using an annual growth rate of 1% and are presented in **Table 11**.

Table 11 – Background and Forecast Traffic Volumes

		Background Traffic (2020)		Forecast Traffic (Year 0 - 2022)		Forecast Traffic (Year 10 - 2032)	
Road	**Location**	**AADT**	**HV%**	**AADT**	**HV%**	**AADT**	**HV%**
HW17	Kyalite Road Intersection	2224	45	2269	45	2506	45
Kyalite Road	East of HW17	22	44	22	44	25	44
McNivens Lane	West of HW17	15	10	15	10	17	10
Back Tomingley West Road	West of HW17	17	10	17	10	19	10

3.4 Development Generated Traffic

The estimates of traffic generated by the Project (both construction and operational) have been used to determine the required intersection upgrades.

For the construction phase, the following locations have been identified for temporary upgrades:

- HW17 and “Kenilworth” property access; and
- HW17 and Kyalite Road Intersection (Existing).

For the operational phase, including intersections impacted by the realignment of HW17, the following locations have been identified for permanent upgrades:

- HW17 and Kyalite Road Intersection (New location);
- HW17and McNivens Lane intersection (New location); and
- HW17 and Back Tomingley West Road (New location).

3.4.1 Peak Hour Volumes (Construction Phase)

It is expected that peak hour movements will occur at the start and end of daily shifts given the vast majority of vehicle movements to and from the Project Site will be workers during the construction phase. Using the information from **Table 9**, the peak hour volumes have been calculated using the maximum daily inward movements based on the following assumptions:

- HW17 peak hours for southbound and northbound traffic derived from available traffic data.
- 40% of maximum daily movements occur during the AM and PM peak hours.
- Traffic origins are 80% from the north and 20% from the south for all vehicles.
- No vehicles are accessing the "Kenilworth" property during the peak hours.
- Given the very low traffic volumes currently using Kyalite Road, five (5) existing inward vehicles movements have been used for the analysis for the new intersection.

A summary of the resultant peak hour volumes for the construction phase are presented in **Table 12** and **Table 13**.

Table 12 – AM Peak Hour Calculations – HW17 and "Kenilworth" Property Access

Activity	Year		HW17 Southbound (vph) (1)	HW17 Northbound (vph) (1)	"Kenilworth" (vph)	Proposed Construction Traffic (vph)		
						HV	LV	Total
Construction	0	2022	48	58	0	48	48	96
Note (1): Shift start at 7:00am (peak highway traffic between 6:00am and 7:00am)								

Table 13 – AM Peak Hour Calculations – HW17 and Kyalite Road Intersection (Existing)

Activity	Year		HW17 Southbound (vph)	HW17 Northbound (vph)	Kyalite Road (vph)	Proposed Construction Traffic (vph)		
						HV	LV	Total
Construction	0	2022	48	58	5	24	68	97
Note (1): Shift start at 7:00am (peak highway traffic between 6:00am and 7:00am)								

3.4.2 Peak Hour Volumes (Operational Phase)

It is expected that peak hour movements will occur at the start and end of daily shifts given the vast majority of vehicle movements to and from the Project Site will be operational and administrative workers. Using the information from **Table 10**, the peak hour volumes have been calculated using the maximum daily inward movements based on the following assumptions:

- HW17 peak hours for southbound and northbound traffic derived from available traffic data.
- 40% of maximum daily movements occur during the AM and PM peak hours.
- Traffic origins are 80% from the north and 20% from the south for all vehicles.
- Given the very low traffic volumes currently using Kyalite Road, five (5) existing inward vehicles movements have been used for the analysis for the new intersection.

A summary of the resultant peak hour volumes for the operational phase and the 10 year horizon for are presented in **Table 14**.

Table 14 – AM Peak Hour Calculations – HW17 and Kyalite Road Intersection (New Location)

Activity	Year		HW17 Southbound (vph)	HW17 Northbound (vph)	Kyalite Road Traffic (vph)	Proposed Operational Traffic (vph)		
						HV	LV	Total
Operations	1	2023	48	59	5	4	96	105
Operations	2	2024	49	59	5	4	96	105
Operations	3	2025	49	60	5	4	96	105
Operations	4	2026	50	61	5	4	96	105
Operations	5	2027	50	61	5	4	96	105
Operations	6	2028	51	62	5	4	96	105
Operations	7	2029	51	62	5	4	96	105
Operations	8	2030	52	63	5	4	96	105
Operations	9	2031	52	64	5	4	96	105
Operations	10	2032	53	64	5	4	96	105

The 10 year forecast traffic estimates provided in **Table 11** have been used to determine the required intersection turn treatments for the new intersections at McNivens Lane and Back Tomingley West Road as a result of the new HW17 realignment. The peak hour volumes have been determined using the following criteria:

- HW17 peak hours for southbound and northbound traffic derived from available traffic data;
- Traffic origins are 80% from the north and 20% from the south for all vehicles.
- Given the very low traffic volumes using McNivens Lane and Back Tomingley West Road, five (5) existing inward vehicles movements have used for the analysis at each intersection.

A summary of the resultant peak hour volumes for the 10 year horizon for each intersection are presented in **Table 15** and **Table 16**.

Table 15 – AM Peak Hour Calculations – HW17 and McNivens Lane Intersection

Activity	Year		HW17 Southbound (vph) (1)	HW17 Northbound (vph) (1)	Total Inward Peak Hour Traffic Movements (vph) (2)
Operations	10	2032	81	81	5
Note (1): Assumed given very low traffic volumes using McNivens Lane					

Table 16 – AM Peak Hour Calculations – HW17 and Back Tomingley West Road Intersection

Activity	Year		HW17 Southbound (vph) (1)	HW17 Northbound (vph) (1)	Total Inward Peak Hour Traffic Movements (vph) (2)
Operations	10	2032	81	81	5
Note (1): Assumed given very low traffic volumes using Back Tomingley West Road					

4 Assessment and Recommendations

The following subsections review the anticipated impacts of the Project on the road network. Discussions relevant to the recommendations for impact mitigation or other controls are also included, where appropriate.

4.1 Construction and Operational Traffic Impacts

Peak Project related traffic movements are anticipated to occur during the construction phase during mid-Year 0 (July 2022) for a duration of 7 months. The vast majority of vehicle movements to and from the construction compound areas will be worker LV and these LV will have negligible impact to the road pavement condition of the existing HW17 alignment and other NSC local roads as described in **Section 3.1**. The provision of temporary intersection upgrades namely at the "Kenilworth" property access and Kyalite Road along the existing HW17 alignment will provide an improved level of service on HW17 during the construction phase which should mitigate potential traffic conflicts with other HW17 road users. The roads used during the construction phase will ultimately be closed with the new HW17 and Kyalite Road realignments used for operational traffic.

A comprehensive Traffic Management Plan (TMP) including a drivers' code of conduct will be developed to control construction related traffic movements and driver behaviour both within the Project Site and the surrounding road network as described in **Section 4.14.**

4.1.1 Heavy Vehicle impacts

As there will be no haulage of ore from the mine on public roads, HV impacts due to the Project are minimised, and will not trigger the requirement for road maintenance contributions. HV movements required for the Project are limited to those required during the construction phase and regular deliveries during the operational phase. Quantities of HV deliveries expected to occur during these phases are detailed in **Table 9** and **Table 10.** The expected origin of these vehicles is 80% from the north (Dubbo and Narromine) and 20% from the south (Parkes and Peak Hill). No Project related HV movements are expected on NSC local roads other than short sections of Back Tomingley West Road, McNivens Lane and Kyalite Road during the construction of the HW17 realignment as described in **Section 3.1.1** and **Section 3.1.2**.

The majority of oversized and over mass HV deliveries will occur during the construction phase. These deliveries will include deliveries associated with the following:

- Construction of the proposed additional ball mill within the TGO Mine Site (via the TGO Mine Site access road).
- Construction of the Kyalite Road, particularly associated with bridge elements and plant (via the existing Kyalite Road intersection).
- Mobilisation and demobilisation of construction plant.

Oversize and over mass HV deliveries during the operational phase will include deliveries associated with the following, all via the proposed new Kyalite Road intersection.

- Mobilisation and demobilisation of mining equipment.
- Delivery of large tyres and other parts.

These oversized and over mass HV deliveries will be conducted in accordance with requirements of the National Heavy Vehicle Regulator (NHVR). Oversize/overmass permits will be acquired prior to haulage of these loads and the transport route for each load will be planned in consultation with TfNSW and will vary depending on the origin of each load. Nevertheless, each journey will comply with the conditions outlined within each permit.

4.2 Road Realignments and Upgrades

The Project will require the following public road upgrades as shown in **Figure 5**.

- 8.3km (approx.) realignment of HW17 including new intersections with Kyalite Road, McNivens Lane and Back Tomingley West Road;
- 2.08km (approx.) realignment of Kyalite Road, including an overpass over the SAR Mine Site Haul Road; and
- A modification of Back Tomingley West Road such that its new intersection with the HW17 realignment is located where minimum sight distance requirements are met.

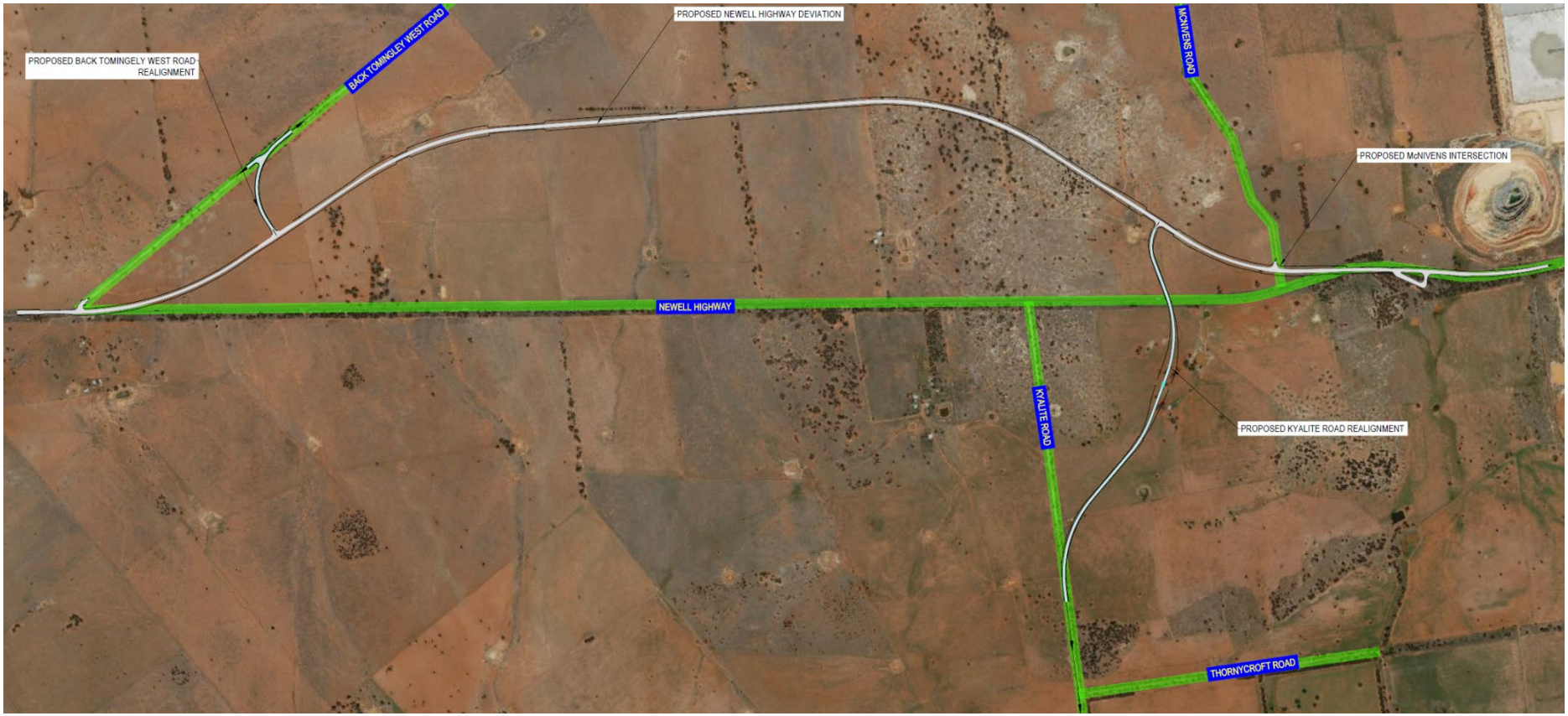


Figure 5 – Proposed Road Realignments and Upgrades

4.3 Design, Construction and Legislative Requirements

4.3.1 Design Requirements

The realignment of HW17 and associated intersections will be subject to the approval of TfNSW in accordance with the specific design and construction requirements as detailed in the TfNSW Works Authorisation Deed (WAD) and SEARs requirements for the Project.

The realignment of Kyalite Road and adjustments to McNivens Lane and Back Tomingley West Road as a result of the HW17 realignment will be designed and constructed in accordance with the minimum requirements as per the NSC '*Engineering Guidelines for Works within the Narromine Shire'* and SEARs requirements for the Project.

4.3.2 Road Safety Audits

The Road Safety Audits (RSA) as described in **Table 17** shall be undertaken as part of the Project.

Table 17 – Road Safety Audits

Type of RSA	Project Phase	Project Requirement
Stage 2 – Concept Design	100% Concept Design	Nominated by the Designer
Stage 3 – Detailed Design	80% Detailed Design	TfNSW Works Authorisation Deed
Stage 4 – Pre-opening	Pre-Opening prior to Practical Completion	TfNSW Works Authorisation Deed
Note: The design RSAs will included both the highway and the NSC local roads.		

4.3.3 Land Acquisition and Property Boundary Adjustments

All land the subject of the proposed HW17 realignment is either:

- freehold land owned by the Applicant;
- unformed Crown roads the subject of an application to purchase by the Applicant; or
- road reserves associated with the existing roads to be realigned.

It is anticipated that appropriate subdivision applications will be prepared for the establishment of the new road corridor and road reserve boundaries and that "land swaps" will be instigated such that control of the new road reserves will pass to the relevant roads authority and control of the redundant sections of road reserve will pass to the Applicant.

It is anticipated that the approval of the 100% concept designs by both TfNSW and NSC will be the milestone to initiate the subdivision and land swap process.

4.3.4 Construction Requirements

The roadwork and bridgework components of the Project shall be undertaken by a suitably prequalified and registered contractor acceptable to TfNSW as per the requirements of the WAD and NSC. The contractor shall be procured by the Applicant.

The Applicant shall also be responsible for obtaining the required Section 138 approvals as per the *NSW Roads Act (1993)* with regards to working in, over or on a public road.

4.3.5 Opening and Closing of Public Roads

As the Project involves the construction of new roads and closure and modification of existing roads, the legislative requirements of the *NSW Roads Act (1993)* with regards to the opening and closing of public roads is required.

The Applicant shall undertake all works and provide the necessary documentation in accordance with the requirements of Part 2 of the *NSW Roads Act (1993)* for the opening of public roads required for the Project.

The Applicant shall undertake all works and provide the necessary documentation in accordance with requirements of Part 4 of the *NSW Roads Act (1993)* for closing of public roads required for the Project.

4.3.6 Property Access

The Applicant shall also be responsible for obtaining the required Section 138 approvals as per the *NSW Roads Act (1993)* with regards to the establishment of new property access points to public roads.

4.4 Classified Roads - Newell Highway (HW17)

The current alignment of HW17 is within the proposed SAR Mine Site. Open cut mining operations will require HW17 to be realigned approximately 1km to the west of its current alignment and with the realigned road to be designed and constructed in accordance with TfNSW requirements. Specific design requirements for the realignment are as follows:

- Provision of an 80m wide road corridor.
- Minimum sealed carriageway width of 12m.
- Provision for 3.5m wide travel lanes, 2m wide shoulders and a 1.0m wide centre line.
- Pavement design with a 20 year pavement life.
- Provision for centre line and edge line markings, retroreflective raised pavement markers and guide posts.
- Allowance for a minimum 1500m long overtaking lane in both the northbound and southbound travelling lanes.
- Provision of Channelised Right (CHR) and Auxiliary Left (AUL) treatments at the new intersections with Kyalite Road, McNivens Lane and Back Tomingley West Road (refer to **Section 4.6**).
- The B-triple design vehicle has been used for the Kyalite Road, McNivens Lane and Back Tomingley West Road intersection designs.
- Provision of drainage structures necessary to achieve a flood immunity of 1 in 20 year average recurrence interval (ARI).
- Provision for regulatory, warning and guide signage.
- Provision for safety barrier along the verges, as required.
- Provision of new rural property access locations to the new alignment, as required.
- The new alignment has been located such that it is at least 650m from the edge of mining operations which means there is no requirement to stop traffic during blasting operations.
- Where the proposed new alignment ties into the existing, redundant pavement and road formation (20m minimum at each end) is to be removed.

A 50% concept design has been completed and reviewed by TfNSW. At the time of submission of this report, the 100% concept design for the realignment was being prepared for submission to TfNSW.

An extract of the current concept design is included in **APPENDIX 3**.

The realignment of HW17 will increase its length by approximately 410m between Tomingley and Peak Hill resulting in an increased travel time of approximately 13 seconds for HW17 users as detailed in **Table 18**.

Table 18 – Changes in Travel Distance and Travel Times

	Travel Distance(1)			Travel Time(1)		
Road Name	**Existing**	**Proposed**	**Change**	**Existing**	**Proposed**	**Change**
HW17 – Tomingley to Peak Hill(3)	16.12km	16.53km	+0.41km	9.00 min(2)	9:13 min(2)	+0:13 min
Note (1) Approximate Lengths and Travel Times with no waiting at intersections. Note (2) Based on the posted speed limits of 110km/h and 80km/h for HW17. Note (3) To the start of the 50km/h speed zone on HW17.						
Source: Google Maps (August 2021) and the 50% Concept Designs.						

Whilst there is an increased travel time along the new alignment of HW17, the standard of road to be constructed will be a significant improvement in terms of road safety and flood immunity in comparison to the existing road.

4.5 Local Roads – General

Upgrades to the local road network associated with the HW17 realignment and the Project site include the following:

- Kyalite Road;
- McNivens Lane; and
- Back Tomingley Road.

The design and construction of these upgrades shall be in accordance with the NSC *'Engineering Guidelines for Works within Narromine Shire'* and any other specific design and construction requirements defined in the SEARs. Specific road design requirements for these roads are as follows:

- Provision of an 20m wide road corridor.
- Minimum carriageway width of 9m for the Back Tomingley West Road realignment and McNivens Lane, inclusive of a bitumen seal of approximately 30m in length from the edge line of HW17.
- Minimum sealed carriageway width of 9m for the full length of the Kyalite Road realignment.
- Provision for 2 x 3.5m wide travel lanes, 1m wide shoulders.
- Pavement design with a 20 year pavement life.
- Provision for centre line and edge line markings on sealed sections.
- Provision of guide posts.
- Provision of drainage structures necessary to achieve a flood immunity of 1 in 20 year average recurrence interval (ARI).
- Provision for regulatory, warning and guide signage, as required.
- Provision for safety barrier along the verges, as required.

The proposed design for local roads exceeds the minimum NSC requirements for Kyalite Road between the intersection with HW17 and the SAR Mine Site access road as 1m wide bitumen sealed shoulders have been provided which results in a full width of sealed formation for the embankments to the Kyalite Road overpass and between any safety barriers resulting in a reduced maintenance burden for NSC.

A 50% concept design has been completed and reviewed by NSC for these roads.

An extract of the 50% concept design is included in **APPENDIX 4**.

4.5.1 Kyalite Road (including the Overpass)

A section of the existing alignment of Kyalite Road is also within the footprint of the SAR Mine Site. Open cut mining operations will require Kyalite Road to be realigned to the north and will require the construction of an overpass over the SAR Mine Site Haul and Services Roads. The realigned section would be sealed from its intersection with HW17 to where it connects with the existing alignment.

The design of the overpass is required to accommodate all types of mining vehicles within the Project site and B-triple HVs along Kyalite Road. The bridge design criteria is below and shown in **Figure 6.**

- Deck length = 36.5m.
- Deck width = 9.4m between the barriers.
- Clear width between abutments for mine vehicles = 33m (approx.)
- Height clearance for mine vehicles = 15m (approx.)
- Design traffic loading = SM1600 in accordance with the Australian Standard AS5100 Bridge Design Code.

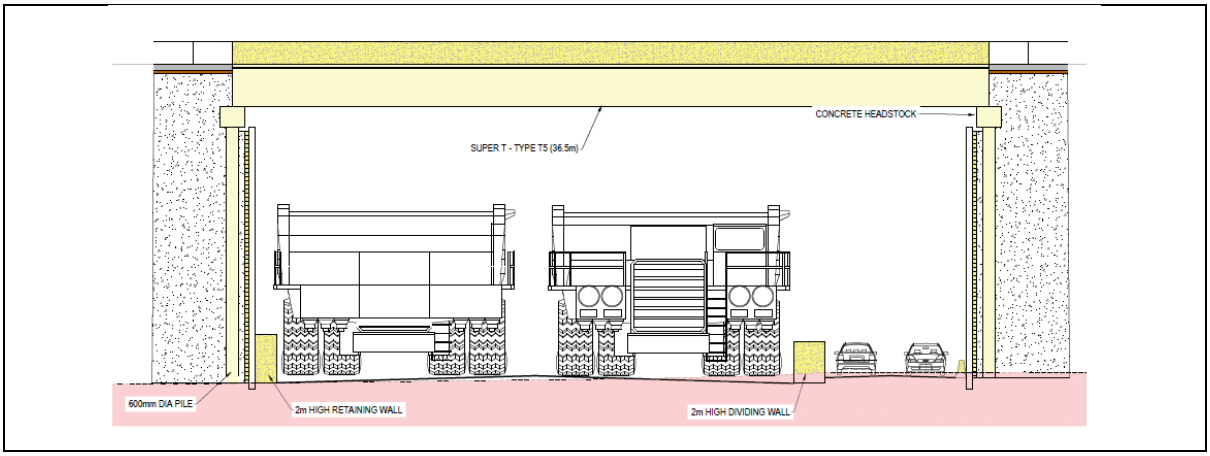


Figure 6 – Overpass Concept

A clear width of 9.4m between the barriers is proposed for the overpass and the design traffic loading of the bridge shall be SM1600 which is the design traffic loading adopted by TfNSW and many local councils for new bridges. This width will accommodate two way traffic movements along Kyalite Road and should adequately cater for any oversize vehicles required to access the SAR Mine Site or oversize agricultural equipment associated with rural properties that access HW17 from Kyalite Road.

The realignment of Kyalite Road will effectively increase its length by approximately 600m and its new intersection with HW17 will be located approximately 700m north of the existing intersection resulting in changes of travel times and distances for Kyalite Road users to Tomingley and Peak Hill as detailed in **Table 19**.

Table 19 – Changes in Travel Distance and Travel Times

	Travel Distance[1]			Travel Time[1]		
Road Name	**Existing**	**Proposed**	**Change**	**Existing**	**Proposed**	**Change**
Kyalite Road – Thornycroft Rd to HW17	2.02 km	2.62 km	+0.60km	1:21 min[2]	1:45 min[2]	+0:24 min
HW17 – Kyalite Road to Tomingley[4]	4.17 km	3.51 km	-0.66km	2:22 min[3]	2:00 min[3]	-0:22 min
HW17 – Kyalite Road to Peak Hill[4]	11.95 km	13.02 km	+1.07km	6:38 min[3]	7:13 min[3]	+0:35 min
Note (1) Approximate Lengths and Travel Times with no waiting at intersections. Note (2) Based on an average speed of 90km/h for Kyalite Road. Note (3) Based on the posted speed limits of 110km/h and 80km/h for HW17. Note (4) To the start of the 50km/h speed zone on HW17.						
Source: Google Maps (August 2021) and the 50% Concept Designs.						

Whilst there is an increased travel time along the new alignment of Kyalite Road, the standard of road to be constructed will be a significant improvement in terms of level of service and road safety in comparison to the existing road.

Motorists using the realigned Kyalite Road would experience the following changes in travel distance and time:

- From the intersection of Thornycroft Road to Tomingley – a reduced distance of approximately 60m and an increased travel time of approximately 2 seconds. This is largely as a result of the reduced travel distance on HW17 with a 110km/h speed limit .
- From the intersection of Thornycroft Road to Peak Hill – an increased distance of approximately 1.67km and associated increased travel time of approximately 59 seconds.

At the end of the mining operation, pending confirmation from NSC, the overpass and embankments will be removed by the Applicant and Kyalite Road shall be reconstructed on a new alignment on the southern side of the overpass which connects to HW17 at the designed intersection similar to that shown in **Figure 7**.

Figure 7 – Proposed Kyalite Road Realignment after the Completion of the Mining Operation

4.5.2 Tomingley Road and Tomingley West Road

As indicated in **Section 3.12**, it is anticipated that there will be up to 10 additional LV movements using the road network between the TGO Mine Site and SAR Mine Site. These additional LV traffic movements are anticipated to be spread out across a normal working day and it is therefore considered that these additional movements will have a negligible impact on the peak traffic flows.

As a result, no upgrades are considered necessary for the following locations:

- HW17 and Tomingley Road intersection;
- Tomingley Road between HW17 and Tomingley West Road;
- Tomingley Road and Tomingley West Road intersection; and
- Tomingley West Road between Tomingley Road and the TGO Mine Site access.

4.5.3 Thornycroft Road

All proposed road adjustments as a result of the Project are clear of Thornycroft Road and this road is not used by Project related traffic. As a result, there are no proposed upgrades for Thornycroft Road.

4.5.4 McNivens Lane

The realignment of HW17 will result in a reduction in the length of McNivens Lane of approximately 90m and no road upgrades are proposed as this road is not used by Project related traffic.

Section 4.6.5.2 details the proposed new intersection with HW17.

4.5.5 Back Tomingley West Road

A realignment of approximately 600m of Back Tomingley West Road and a new intersection with HW17 is required as a result of the proposed HW17 realignment. The new intersection is to be located to the north of the existing intersection to ensure minimum sight distances are met. In addition, the location of the new intersection will be at an elevation slightly higher than the existing providing improved flood immunity.

The existing HW17 intersection will be closed and a cul-de-sac shall be provided on the redundant section of Back Tomingley West Road with landscaping to be provided between the cul-de-sac and HW17.

Section 4.6.5.3 details the proposed new intersection with HW17.

4.6 Intersections

During the construction phase, the "Kenilworth" property access and the existing HW17 and Kyalite Road intersection will be used for access to the proposed construction site compound areas. These intersections currently have no turn treatments however given the volume of construction traffic that will use these intersections, temporary upgrades will be required as described in **Section 4.6.3.1** and **Section 4.6.3.2** respectively.

Three NSC local roads namely, McNivens Lane, Kyalite Road and Back Tomingley West Road currently intersect with HW17 and will be subsequently impacted by the HW17 realignment. Whilst these intersections currently have no turn treatments, the required turn treatments will be provided as part of the design associated with the HW17 realignment and are discussed in **Section 4.6.5**. The new HW17 and Kyalite Road intersection will be used during the operational phase of the Project.

4.6.1 Types of Turn Treatments

The types of right and left turn treatments required for T-intersections as defined by *AUSTROADS Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections* as follows:

- Basic turn treatment (BA) where turning vehicles may share the lane with through traffic movements. The BAR treatment features a widened shoulder on the major road that allows through vehicles, having slowed, to pass to the left of turning vehicles. The BAL treatment on the major road has a widened shoulder, which assists turning vehicles to move further off the through carriageway making it easier for through vehicles to pass (refer **Figure 8**).
- Auxiliary lane turn treatment (AU) where a separate lane is provided to enable the turn to be performed in an additional lane. AUL for left turn and AUR for right turn treatments (refer **Figure 9**).
- Channelised (CH) turn treatment which provides a traffic island to enhance the safety of right-turning or left-turning vehicles. CHL for left turn and CHR for right turn treatments (refer **Figure 10**).

Austroads also allows for the provision of AUL (Short) and CHR (Short) turn treatments. The length of these lanes are less than that of the AUL and CHR turn treatments.

The assessment for intersection turn treatments can result in a combination of the different right and left turn treatments for a T-intersection (e.g.: CHR and AUL)

The following sections of the report detail the warrants for the provision of turn treatments and the assessment for the required turn treatments for the T-intersections associated with the Project.

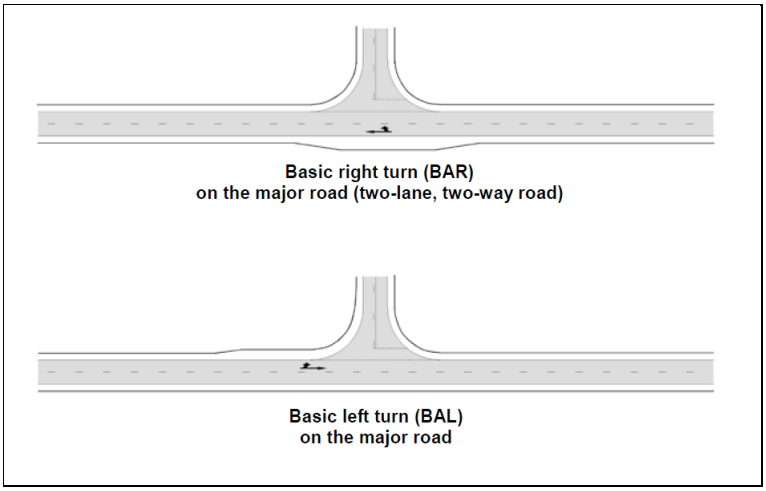


Figure 8 – BAR and BAL Turn treatments
(Source: Austroads)

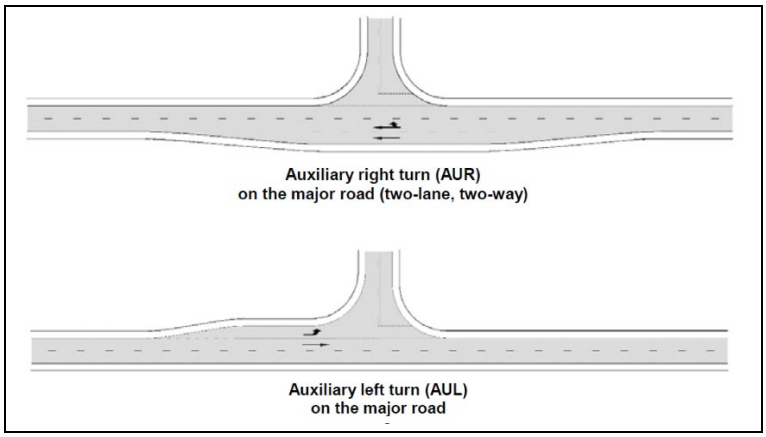


Figure 9 – AUR and AUL Turn treatments
(Source: Austroads)

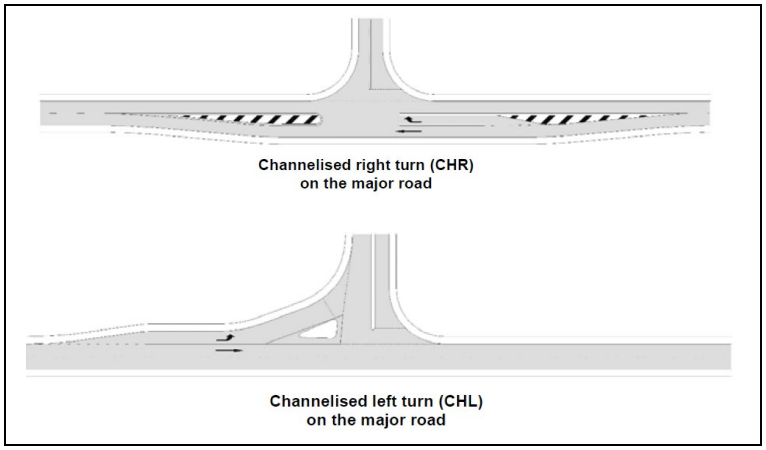


Figure 10 – CHR and CHL Turn treatments
(Source: Austroads)

4.6.2 Warrants for Basic, Auxiliary and Channelised Turn Treatments

Appendix A.10 of *AUSTROADS Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections,* specifies warrants for providing left and right turn treatments at unsignalised intersections including property access points. The graph reproduced below as **Figure 11** shows the volumes of traffic at an intersection subject to speed limits equal to and greater than 100km/h.

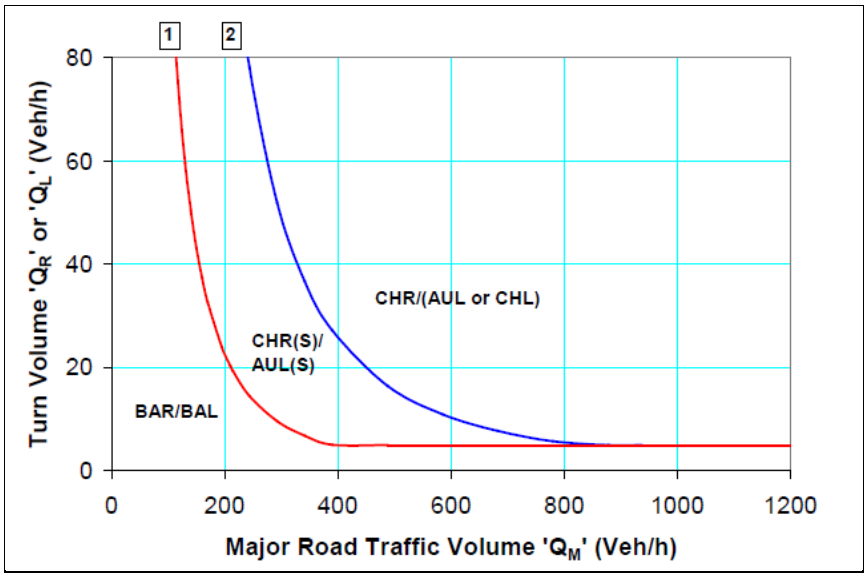
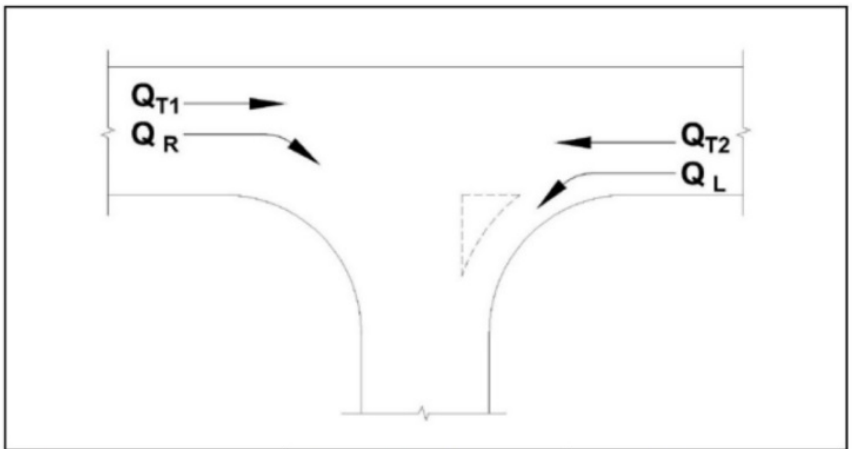


Figure 11 – Warrants for turn treatments – Design speed ≥ 100km/h

Appendix A.11 of *AUSTROADS Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections* defines the traffic and turn volume parameters and this has been reproduced as **Figure 12**.

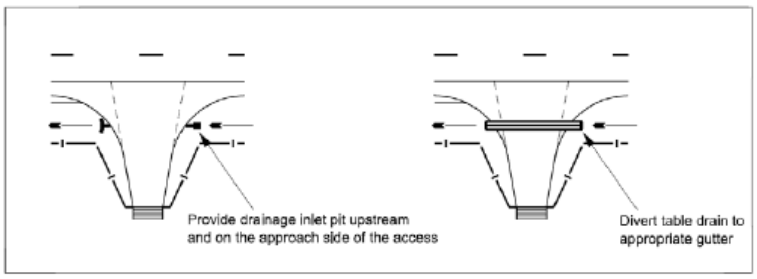


Turn type	Splitter island	Q_M (veh/h)
Right	No	$= Q_{T1} + Q_{T2} + Q_L$
Right	Yes	$= Q_{T1} + Q_{T2}$
Left	No/Yes	$= Q_{T2}$

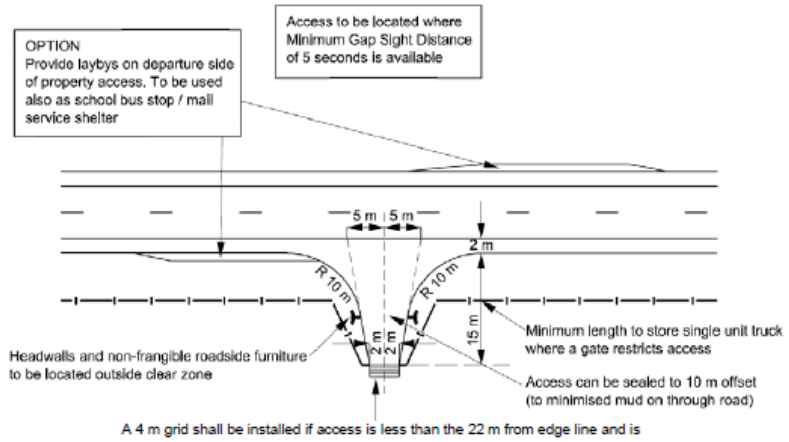
Figure 12 – Traffic and Turn Volume Parameters

4.6.3 Property Access

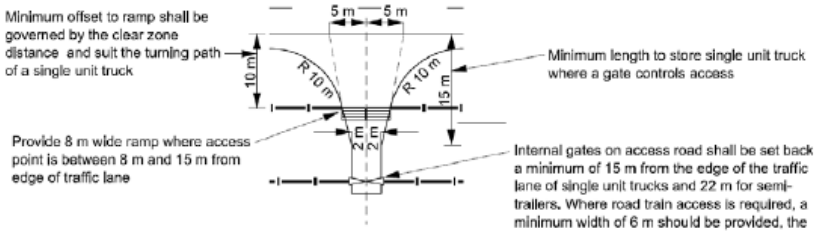
Where a new rural property access is required or an existing access needs to be upgraded, for both the construction and operational phases, they shall be designed in accordance with Figure 7.2 *AUSTROADS Guide to Road Design – Part 4:* Intersections and Crossings – General which has been reproduced as **Figure 13**.



Alternate treatments for table drain crossing



Preferred option with indented access
(showing single carriageway layout)



Option without indented access

Note: This rural property access treatment may be used where articulated vehicles:

- *do not use the driveway on single and dual carriageway roads*
- *infrequently use the driveway on two-lane two-way roads that have an AADT < 2000.*

Figure 13 – Example of a Rural Property Access

(Source: Austroads)

4.6.4 Intersections (Construction Phase)

4.6.4.1 Road Construction Compound Area Access Point ("Kenilworth" Property)

Traffic volume parameters have been calculated for the construction phase (Year 0 - 2022) and have been listed in **Table 20.**

Table 20 – Traffic Parameters (vehicles per hour)

Parameter	Year 0 (2022)
	Peak Hour (vph)
Q_R	77
Q_L	19
$Q_{M\ (R)}$	125
$Q_{M\ (L)}$	58

Figure 14 shows the traffic volume parameters diagrammatically for the HW17 and Kyalite Road intersection and these parameters have then been used to determine the warrant for turn treatments by plotting them on the Austroads graph.

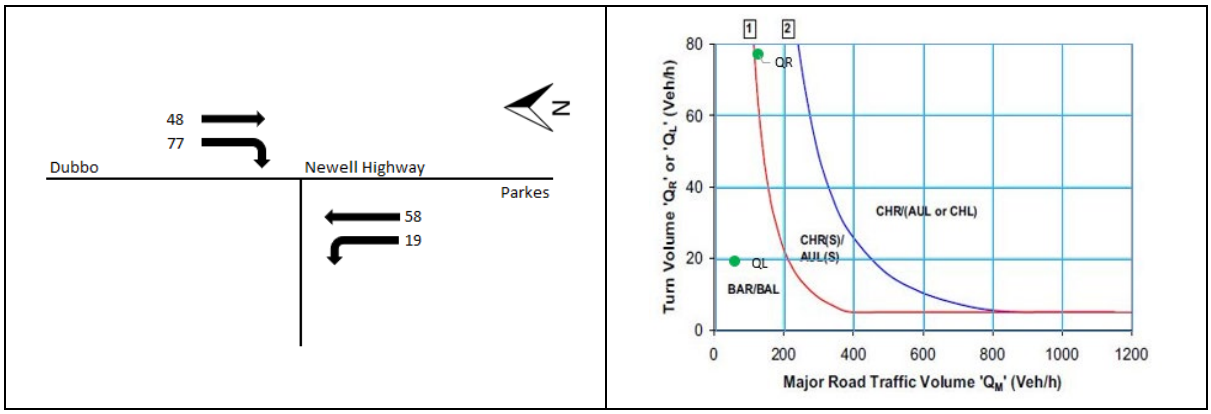


Figure 14 – Peak Hour Flows (Year 0 - 2022)

The resultant outcome is that the "Kenilworth" property access will require temporary upgrading inclusive of CHR(S) and BAL turn treatments on HW17 during the construction phase. It is noted however that CHR(S) turn treatments are no longer accepted by TfNSW and as a result the required temporary upgrading will require CHR and BAL turn treatments.

4.6.4.2 HW17 and Kyalite Road (Existing HW17 Alignment)

As indicated in **Section 3.1.1,** all construction related traffic is to come from the north along HW17 to access this intersection. Traffic volume parameters have been calculated for the construction phase (Year 0 - 2022) and have been listed in **Table 21.**

Table 21 – Traffic Parameters

Parameter	Year 0 (2022)
	Peak Hour (vph)
Q_R	0
Q_L	97
$Q_{M\ (R)}$	203
$Q_{M\ (L)}$	58

Figure 15 show the traffic volume parameters diagrammatically for the HW17 and Kyalite Road intersection and these parameters have then been used to determine the warrant for turn treatments by plotting them on the Austroads graph.

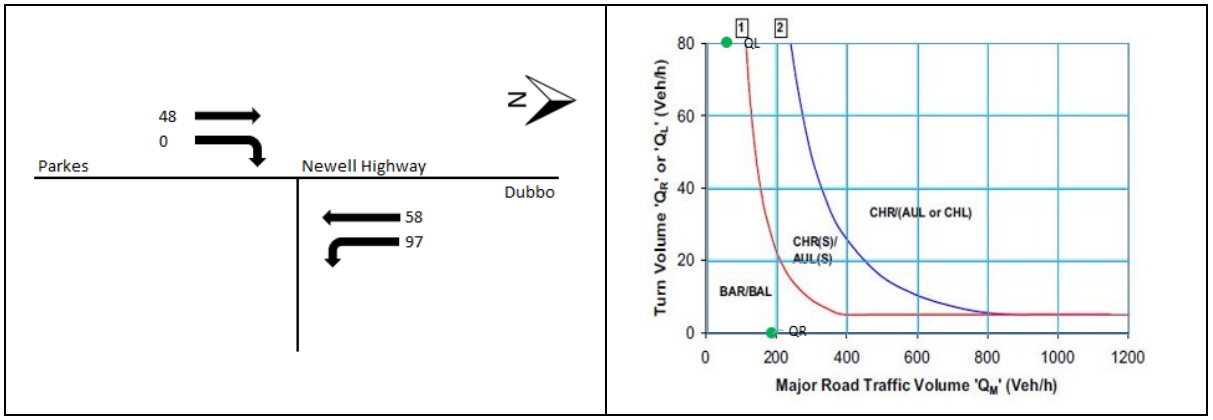


Figure 15 – Peak Hour Flows (Year 0- 2022)

The resultant outcome is that the HW17 and Kyalite Road intersection will require temporary upgrading to provide a BAL turn treatment during the construction phase.

4.6.5 Intersections (Operational Phase)

4.6.5.1 HW17 and Kyalite Road (New HW17 Alignment)

Traffic volume parameters have been calculated for the operational phase (Year 1 - 2023) and the Project life operational phase (Year 10 - 2032). These parameters have been listed in **Table 22.**

Table 22 – Traffic Parameters

Parameter	Year 1 (2023)	Year 10 (2032)
	Peak Hour (vph)	Peak Hour (vph)
Q_R	21	21
Q_L	83	83
$Q_{M\ (R)}$	187	197
$Q_{M\ (L)}$	59	64

Figure 16 and **Figure 17** show the traffic volume parameters diagrammatically for the HW17 and Kyalite Road intersection and these parameters have then been used to determine the warrant for turn treatments by plotting them on the Austroads graph.

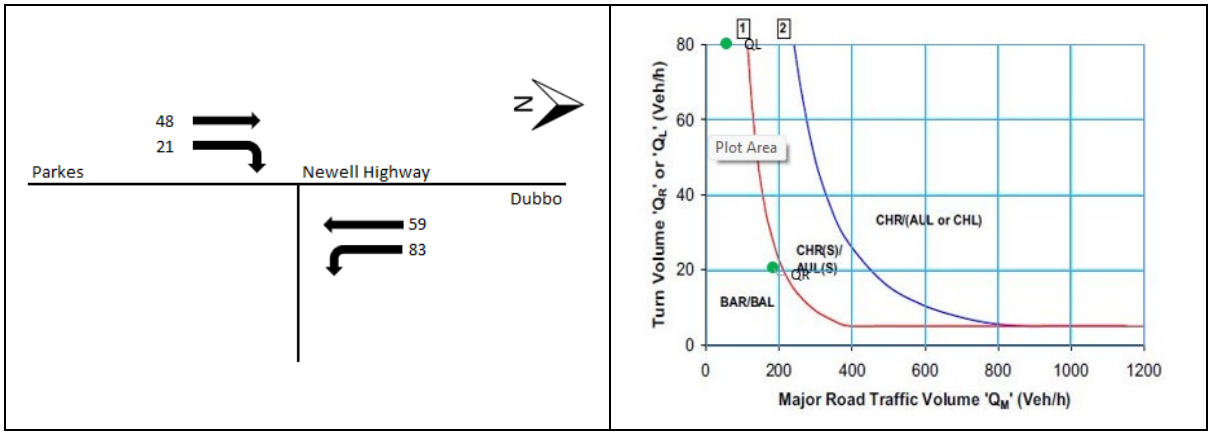


Figure 16 – Peak Hour Flows (Year 1 - 2023)

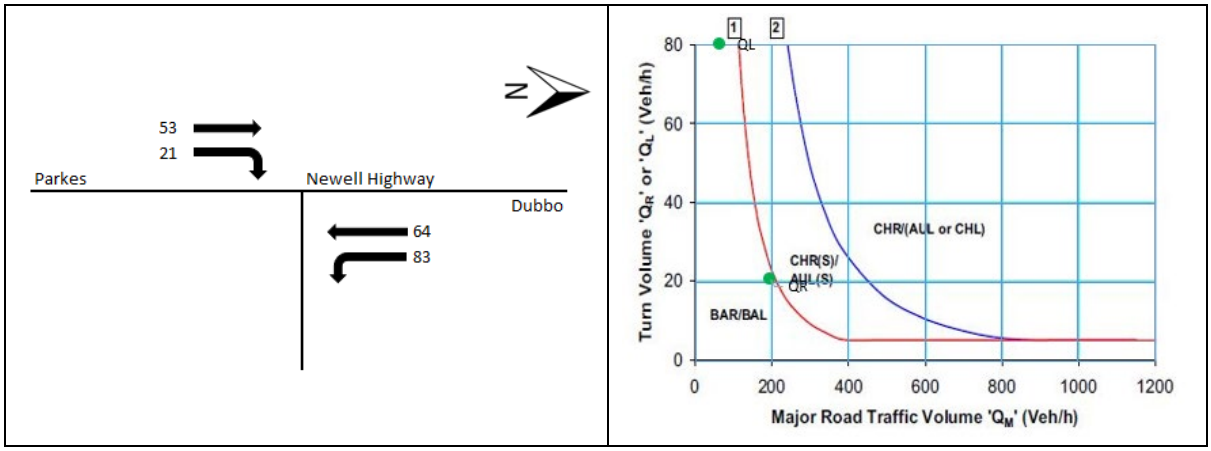


Figure 17 – Peak Hour Flows (Year 10 - 2032)

The resultant outcome for the 10 year horizon is that the HW17 and Kyalite Road intersection will require BAR and BAL turn treatments. Notwithstanding the above, the Applicant has agreed with TfNSW to provide CHR and AUL turn treatments which exceed the minimum requirements. The proposed intersection will therefore provide an enhanced level of service over that required from the Austroads analysis.

4.6.5.2 HW17 and McNiven Lane (New HW17 Alignment)

Traffic volume parameters have been calculated for the Project life operational phase (Year 10 - 2032). These parameters have been listed in **Table 23.**

Table 23 – Traffic Parameters

Parameter	Year 10 (2032)
	Peak Hour (vph)
Q_R	4
Q_L	1
$Q_{M\ (R)}$	118
$Q_{M\ (L)}$	53

Figure 18 shows the traffic volume parameters diagrammatically for the HW17 and McNivens Lane intersection and these parameters have then been used to determine the warrant for turn treatments by plotting them on the Austroads graph.

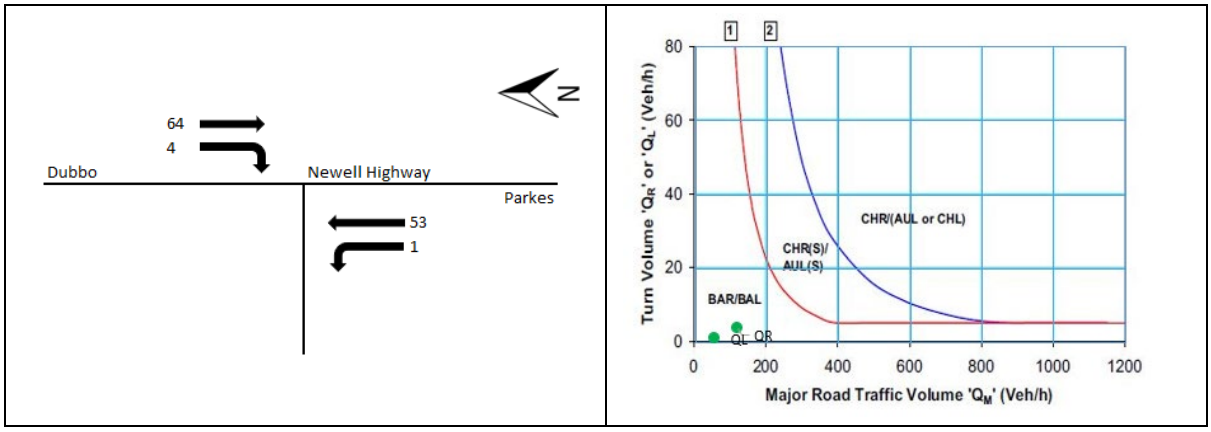


Figure 18 – Peak Hour Flows (Year 10 - 2032)

The resultant outcome for both scenarios is that the HW17 and McNivens Lane intersection will require BAL and BAR turn treatments. Notwithstanding the above, the Applicant has agreed with TfNSW to provide CHR and AUL turn treatments which exceed the minimum requirements. The proposed intersection will therefore provide an enhanced level of service over that required from the Austroads analysis.

4.6.5.3 HW17 and Back Tomingley West Road (New HW17 Alignment)

Traffic volume parameters have been calculated for the Project life operational phase (Year 10 - 2032). These parameters have been listed in **Table 24.**

Table 24 – Traffic Parameters

Parameter	Year 10 (2032)
	Peak Hour (vph)
Q_R	4
Q_L	1
$Q_{M\ (R)}$	118
$Q_{M\ (L)}$	53

Figure 19 shows the traffic volume parameters diagrammatically for the HW17 and the Back Tomingley West Road intersection and these parameters have then been used to determine the warrant for turn treatments by plotting them on the Austroads graph.

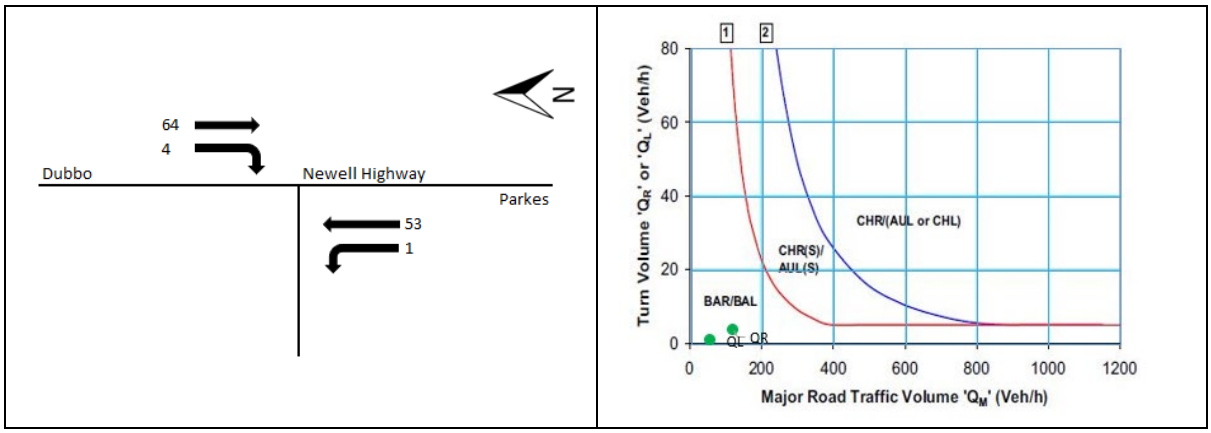


Figure 19 – Peak Hour Flows (Year 10 - 2032)

The resultant outcome for both scenarios is that the HW17 and Back Tomingley West Road intersection will require BAL and BAR turn treatments. Notwithstanding the above, the Applicant has agreed with TfNSW to provide CHR and AUL turn treatments which exceed the minimum requirements. The proposed intersection will therefore provide an enhanced level of service over that required from the Austroads analysis.

4.6.5.4 SAR Mine Site Construction Compound Area Access Point (Construction Phase)

Vehicle movements in and out of the SAR Mine Site construction compound areas will be left in and right out. Given the relatively low traffic volumes along the existing Kyalite Road alignment, the proposed property access arrangement from Kyalite Road is a typical rural property access as per **Figure 13**, with provision for two way traffic movements.

4.6.5.5 TGO Mine Site Access (Operational Phase)

Further to **Section 4.5.2**, it is anticipated that there will be up to 10 additional LV movements using the road network between the TGO Mine Site and SAR Mine Site. These additional LV traffic movements are anticipated to be spread out across a normal working day and it is therefore considered that these additional movements will have a negligible impact on the peak traffic flows.

As a result, no upgrades to the existing TGO Mine Site access off Tomingley West Road are proposed.

4.6.5.6 SAR Mine Site Access (Operational Phase)

The SAR Mine Site access is located approximately 1.3km from HW17 along the Kyalite Road realignment. The location of this access has been chosen such that minimum SISD has been achieved for the 100km/h speed zone.

Vehicle movements in and out of the SAR Mine Site will be left in and right out. Given the relatively low traffic volumes along Kyalite Road, the proposed property access arrangement from Kyalite Road is T-intersection configuration, inclusive of a BAL turn treatment, with the SAR Mine Site access road accommodating two way traffic movements.

Given the 100km/h speed limit, the significant improvement to the realigned section of Kyalite Road and the number of vehicles using the SAR Mine Site access, the provision of Side Road and Truck advanced warning signage (refer **Figure 20** and **Figure 21**).located on both approaches of Kyalite Road to the SAR Mine Site access are to be provided to warn road users of the vehicle activity at this location

Figure 20 – Side Road Warning Sign

Figure 21 – Truck Warning Sign

4.7 Rural Property Access and Addressing

As part of the HW17 realignment, the Applicant is proposing to close four existing rural property access points associated with Applicant owned land holdings namely, Kenilworth, Old Thornycroft and Rosewood (x2)**.** Proposed property access locations for the HW17 realignment are shown in **APPENDIX 5.**

Where a new rural property access is required to replace an existing rural property access, they shall be designed in accordance with **Figure 13**.

The provision of BAR and BAL layouts for the new rural property access points is considered to be unnecessary for the following reasons:

- The sealed pavement width of the HW17 realignment includes 2m wide shoulders and a 1m wide centre line treatment. This available pavement width should provide sufficient space for vehicles to complete any turning manoeuvres into these rural properties as well as allowing enough room for road users to pass them.

Where required, updates to property access addressing (Rural Road Numbering) as a result of any new property access points associated with the road realignments shall be undertaken by the Applicant in accordance with NSC requirements prior to the opening of the new public roads.

4.8 Utility Adjustments / Relocations

The road realignments and upgrades will require adjustments to existing utilities such as Telstra, Nextgen and Essential Energy for example.

The Applicant is responsible for co-ordinating and gaining the necessary approvals from impacted utility providers for any utility adjustments and relocations required to be accommodated within the new road corridors as a result of the Project.

The Applicant shall be responsible for the procurement of the design and construction of any utility adjustments and relocations and these works are to be completed prior to the opening of the new public roads.

4.9 Local Climate Conditions

Flooding of HW17 currently occurs for less than 1:20 ARI events, approximately every 5 years. This results in water overtopping the HW17 north of McNivens Lane and in constructed causeways between Kyalite Road and Back Tomingley West Road.

4.10 Noise, Dust, Lighting and Visual Impacts

4.10.1 Noise

Details regarding noise impacts attributable to traffic associated with the Project are detailed in the separate assessment reports included with the EIS.

4.10.2 Dust

Details regarding dust impacts attributable to traffic associated with the Project are detailed in the separate assessment reports included with the EIS.

With regards to the road realignments and upgrades, dust suppression during construction will generally be via the use of water trucks and will be the responsibility of the contractor to be engaged by the Applicant. The management of dust will be in accordance with the contractor's environmental management plan to be approved by TfNSW which is to be developed by the contractor such that it meets the requirements of the relevant TfNSW QA Construction Specifications inclusive of the mitigation measures for dust included in the EIS.

4.10.3 Lighting

Details regarding lighting impacts attributable to traffic associated with the Project are detailed in the separate assessment reports included with the EIS.

4.10.4 Visual

The Applicant is designing a visual amenity bund on the western side of the Haul Road as part of the SAR Mine Site design to restrict road users along HW17 from viewing the mining operations. The location of the visual amenity bund, referred to as the SAR Amenity Bund as shown in **Figure 22** below, would be constructed in a manner that would ensure motorists using HW17 cannot see mine-related vehicle movements on the Haul Road. This would limit the potential for driver distraction on HW17.

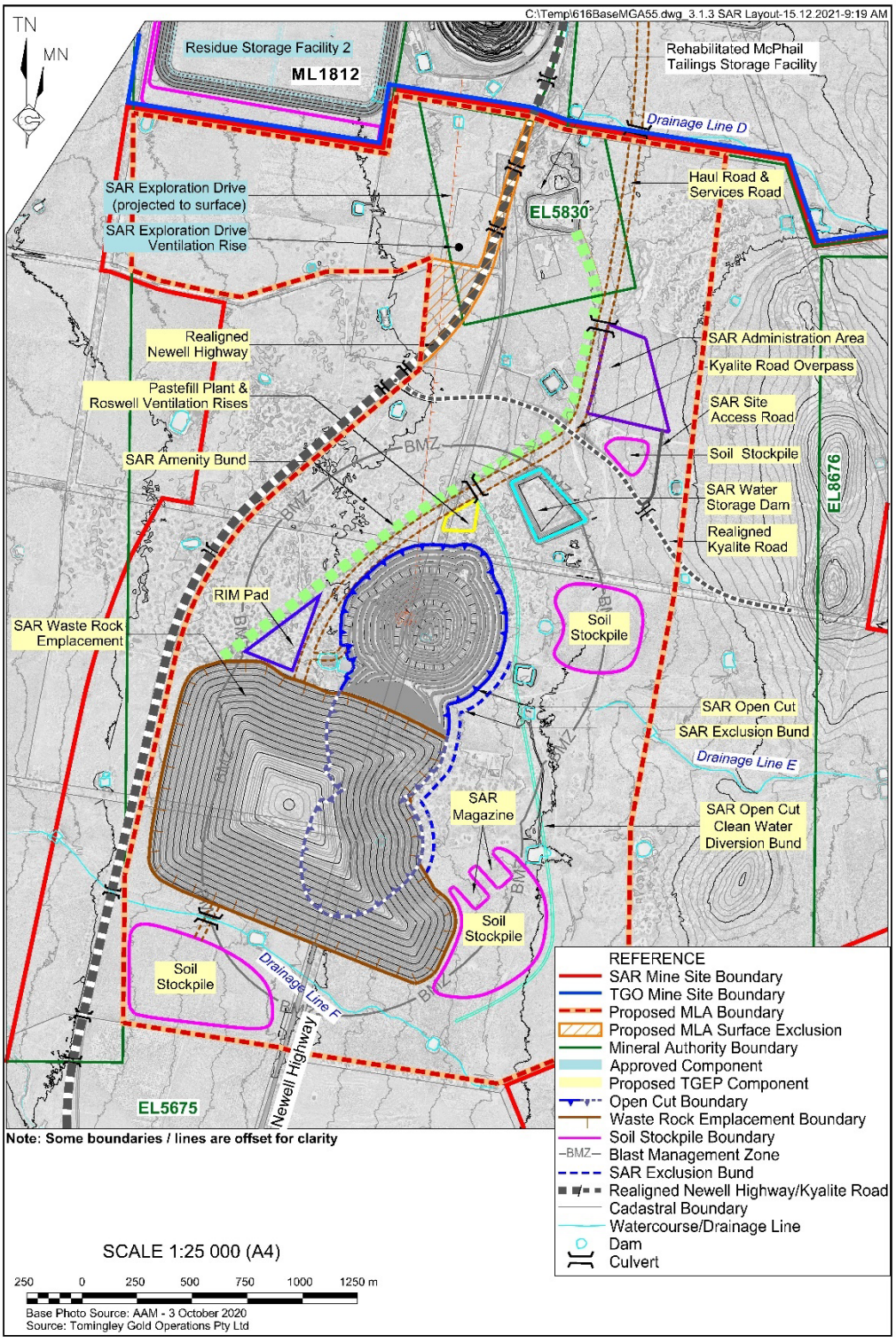


Figure 22 – SAR Mine Site Layout
(Source: RWC, 2021)

4.11 Bus Services

As described in **Section 2.5**, there are several school and passenger bus services that use the surrounding road network in the vicinity of the Project Site. There are no formal bus stops on the NSC local roads and the school bus services using these roads pick up students wherever required. Bus services using HW17 pick and set down passengers at designated stops within the 50km/h speed zone in the Tomingley village.

Worker shift changeover times during the construction phase and operational phase of the Project occur before and after school bus morning and afternoon travel times.

As the proposed road construction compound area as described in **Section 3.1.1** is to be located off HW17, there will be a minor increase in traffic volumes during peak morning and afternoon times when workers enter and leave the proposed construction compound area however, it is considered that the road construction phase is unlikely to impact on any of these bus services.

The existing HW17 intersections with Back Tomingley West Road and Kyalite Road will be available at all times during the construction phase until the traffic switch to the new HW17 realignment and associated new intersections.

Whilst there will be a minor increase in traffic volumes during peak morning and afternoon times when workers enter and leave the Project Site, it is considered unlikely that the construction and operational phases of the Project will impact on these school bus services.

4.12 Pedestrians and Cyclists

Given the surrounding rural environment and the distance of the Project Site from populated areas such as Tomingley, it is considered that the Project is unlikely to impact on pedestrians and cyclists.

4.13 Rail Services

The existing Parkes to Narromine rail line which has been upgraded to form part of the Inland Rail network is located approximately 4km west of the western boundary of the Project Site . As there is no rail infrastructure within the vicinity of the Project Site, the Project will have no impact on rail infrastructure, the rail corridor or rail services.

4.14 Traffic Management and Code of Conduct

Although there are relatively low traffic volumes associated with the construction and operational phases of the Project**,** a Traffic Management Plan (TMP), inclusive of a driver code of conduct, will be developed by the principal contractors during the road and mine phases. This will assist with the control of Project related traffic movements, provide details of school bus services, and ensure that driver behaviour on the surrounding road network is maintained to a safe level that accounts for local conditions.

It is also expected that a TMP will be developed by the Applicant for the operational phase of the SAR Mine Site and TGO Mine Site that would replace the existing TGO Mine Site TMP.

4.15 Cumulative Traffic Impacts

There are no known other traffic generating developments or proposed developments in close proximity the Project Site. As the construction of the HW17 realignment is offline and the existing HW17 alignment will be unimpeded during the construction phase, except for the construction of the tie ins of the new alignment to the existing alignment, it is considered that there will be no cumulative traffic impact on the road network as a result of this Project.

5 Conclusion

Matters relating to traffic and transport for the Project have been addressed in this report. The analysis and discussions presented in this Integrated Transport Assessment report are summarised as follows:

Project Construction Phase

- The construction phase for the Project is anticipated to be approximately 7 months nominally commencing in July 2022.
- Project related traffic during the construction phase will result in a negligible increase to traffic volumes on the existing HW17 alignment and as such, HW17 has sufficient capacity to cater for the combined background traffic and construction related traffic.
- The following temporary roadworks are required for the construction phase:
  - Construction of a temporary intersection upgrade at the existing HW17 and Kyalite Road intersection consisting of BAL turn treatment that satisfies the requirements of TfNSW. The temporary intersection is to be designed to cater for the largest HV construction vehicle required to access the SAR Mine Site and Kyalite Road construction site compound areas.
  - Construction of a temporary site access from the existing Kyalite Road alignment as the Proposed Entry and Exit point for the SAR Mine Site and Kyalite Road construction site compound areas.
  - Construction of a temporary intersection upgrade at the existing HW17 and 'Kenilworth" property access consisting of a CHR and BAL turn treatment that satisfies the requirements of TfNSW. The temporary intersection is to be designed to cater for the largest HV construction vehicle using the Proposed Entry Point to the HW17 construction site compound area;
  - Construction of a temporary site access from McNivens Lane as the Proposed Exit Point 1 from the HW17 construction site compound in the vicinity of the alignment of the proposed HW17 realignment. Vehicles would then use the existing HW17 and McNivens Lane intersection.
  - Construction of a temporary site access from Back Tomingley West Road as the Proposed Exit Point 2 from the HW17 construction site compound in the vicinity of the alignment of the proposed HW17 realignment. Vehicles would then use the existing HW17 and Back Tomingley West Road intersection
- Provision of a Traffic Management Plan (TMP) and driver code of conduct is considered desirable during the construction phase. This will assist with the control of construction related traffic movements and ensure that driver behaviour on the surrounding road network and within the SAR Mine Site during construction is maintained to a safe level that accounts for local conditions.

Project Operational Phase

- No upgrades are considered necessary for the existing TGO Mine Site Access, Tomingley West Road, Tomingley Road and associated intersections given very low additional Project related traffic using the public road network travelling between the TGO Mine Site and SAR Mine Site.
- As there will be no transportation of ore from the Project Site on public roads, HV impacts on the surrounding road network as a result of the operational phase of the Project are expected to be minimal.
- The following permanent roadworks are required for the operational phase:
  - Construction of a new HW17 realignment, inclusive of the new intersections for Kyalite Road, McNivens Lane and Back Tomingley West Road, that satisfies the requirements of TfNSW;
  - Construction of a new realignment of Kyalite Road, including overpass, to its new intersection with the realigned HW17 that satisfies the requirements of NSC;

  - Construction of a new SAR Mine Site access road off the new realignment of Kyalite Road, inclusive of a BAL turn treatment that satisfies the requirements of NSC;
  - Construction of a new SAR Mine Site private access road;
  - Construction of a new realignment of Back Tomingley West Road to its new intersection with HW17 that satisfies the requirements of NSC;
  - Where the existing HW17 and Back Tomingley West Road intersection will be closed, a cul-de-sac shall be constructed on the redundant section of Back Tomingley West Road with landscaping to be provided between the cul-de-sac and HW17 that satisfies the requirements of TfNSW and NSC;
  - Where the proposed new alignment ties into the existing, redundant pavement and road formation (20m minimum at each end) is to be removed.
  - Construction of new property access points long the realigned sections of HW17, Kyalite Road and Back Tomingley Road, as required.
- At the end of the mining operation, the Kyalite Road overpass and embankments will, following confirmation by NSC, be removed by the Applicant and Kyalite Road shall be reconstructed on a new alignment on the southern side of the overpass which connects to the designed HW17 intersection.

Other Road Related Matters

- The new alignments for HW17, Kyalite Road, Back Tomingley West Road and new property access points, are to be opened in accordance with the *Roads Act 1993*, once the permanent roadworks required for the operational phase have been completed.
- Redundant sections of HW17, McNivens Lane and Kyalite Road and redundant property access points are to be closed in accordance with the *Roads Act 1993*, once the permanent roadworks above have been completed.
- No road upgrades are required at the following locations as no operational traffic will use these roads:
  - Thornycroft Road;
  - Back Tomingley West Road between the start of its new alignment and Tomingley West Road; and
  - McNivens Lane between its new intersection on the HW17 realignment and Back Tomingley West Road.
- Impacts on the surrounding road network in terms of bus services will be negligible given the volume of Project related traffic and insignificant for pedestrians and cyclists;

It is concluded that subject to the recommended temporary and permanent roadworks being implemented, there are no Project related traffic and transport issues which would prevent the Project from proceeding.

6 References

- NSW Roads and Traffic Authority (2002), 'Guide to Traffic Generating Developments'.
- Austroads (2016), 'Guide to Road Design – Part 3: Geometric Design'.
- Austroads (2017), 'Guide to Road Design – Part 4: Intersections and Crossings - General'.
- Austroads (2017), 'Guide to Road Design – Part 4A: Un-signalised and Signalised Intersections'.
- Austroads (2010), 'Guide to Road Design Part 6: Roadside Design, Safety and Barriers'.
- Transport for NSW (2016), 'Definitions and Notes to Support LGA Visualisations, NSW Centre for Road Safety'.
- NSW Roads and Maritime Services (2007), 'Route Standards – Route by Route Values (Western Region)'.
- Transport for NSW (2021), 'Major Works Authorisation Deed Private Financing and Construction for the Newell Highway Re-Alignment, Tomingley NSW'.
- Narromine Shire Council (2020), 'Engineering Guidelines for Works within Narromine Shire' - Version 1.

Appendix 1: Traffic Data

austraffic

Road	Newell Highway
Location	Between Back Tomingley Rd And Kyalite Rd
Site No.	9109_1
Start Date	Wednesday 19 Aug 2020
Suburb	Tomingley

Northbound

Day of Week1

Starting Time	Mon 24-Aug	Tue 25-Aug	Wed 19-Aug	Thu 20-Aug	Fri 21-Aug	Sat 22-Aug	Sun 23-Aug	Ave W'day	All Days Ave
AM Peak	41	52	49	48	49	51	41		
PM Peak	50	48	56	51	50	48	43		
0:00	3	12	11	8	4	6	13	8	8
0:30	5	1	2	2	2	2	4	2	3
1:00	1	3	4	9	5	7	6	4	5
1:30	0	3	4	4	2	4	3	3	3
2:00	1	3	7	5	2	1	2	4	3
2:30	0	8	1	8	3	1	2	4	3
3:00	1	1	3	3	1	5	3	2	2
3:30	1	8	5	4	3	4	3	4	4
4:00	6	9	8	14	5	8	1	8	7
4:30	6	7	6	10	10	6	2	8	7
5:00	4	14	5	12	10	10	6	9	9
5:30	17	29	24	22	26	19	10	24	21
6:00	28	36	49	48	28	23	19	38	33
6:30	27	27	29	32	23	22	8	28	24
7:00	26	38	46	31	41	17	11	36	30
7:30	33	47	47	43	30	28	18	40	35
8:00	34	32	37	41	39	31	19	37	33
8:30	30	41	33	44	49	49	20	39	38
9:00	18	35	48	43	41	36	30	37	36
9:30	41	51	41	43	40	40	40	43	42
10:00	38	47	37	47	33	50	24	40	39
10:30	34	39	45	39	32	51	40	38	40
11:00	40	52	33	44	38	47	31	41	41
11:30	29	33	35	34	30	46	41	32	35
12:00	32	33	40	48	33	25	42	37	36
12:30	28	40	33	26	32	38	42	32	34
13:00	38	40	56	51	40	48	35	45	44
13:30	37	41	37	44	41	39	32	40	39
14:00	33	41	53	42	32	31	43	40	39
14:30	36	36	32	49	47	42	40	40	40
15:00	33	48	39	35	34	27	33	38	36
15:30	50	47	36	37	50	27	39	44	41
16:00	45	42	41	34	33	24	27	39	35
16:30	33	34	30	51	32	32	34	36	35
17:00	35	36	42	37	32	17	16	36	31
17:30	26	37	29	26	32	18	23	30	27
18:00	24	32	38	27	23	18	26	29	27
18:30	25	19	21	18	24	17	14	21	20
19:00	11	15	13	13	15	17	12	13	14
19:30	21	18	16	13	24	14	12	18	17
20:00	11	8	16	12	13	8	8	12	11
20:30	21	10	11	8	12	9	12	12	12
21:00	12	16	10	5	10	22	10	11	12
21:30	9	14	11	9	9	11	8	10	10
22:00	18	11	10	11	7	15	7	11	11
22:30	16	11	14	5	11	8	9	11	11
23:00	14	6	13	7	8	9	6	10	9
23:30	8	4	11	4	17	7	4	9	8
Total	1039	1215	1212	1202	1108	1036	890	1155	1100
% Heavies	41.1%	53.3%	52.5%	49.5%	40.4%	42.5%	44.2%	47.7%	46.6%

Day of Week2

Starting Time	Mon 31-Aug	Tue 1-Sep	Wed 26-Aug	Thu 27-Aug	Fri 28-Aug	Sat 29-Aug	Sun 30-Aug	Ave W'day	All Days Ave
AM Peak	42	55	54	53	48	52	47		
PM Peak	43	59	47	57	57	46	42		
0:00	0	6	11	9	2	2	5	6	5
0:30	5	8	7	1	4	5	6	5	5
1:00	4	4	7	5	3	3	4	5	4
1:30	1	5	6	8	3	5	5	5	5
2:00	4	4	4	4	3	3	3	4	4
2:30	3	7	6	4	2	8	0	4	4
3:00	1	7	6	2	4	4	6	4	4
3:30	3	5	7	10	7	6	3	6	6
4:00	4	6	7	11	5	4	7	7	6
4:30	6	10	8	8	8	3	5	8	7
5:00	6	16	14	11	7	9	4	11	10
5:30	20	24	23	23	22	15	8	22	19
6:00	33	42	46	50	31	10	11	40	32
6:30	31	35	35	25	18	17	7	29	24
7:00	30	55	34	37	33	41	6	38	34
7:30	29	35	45	42	32	44	25	37	36
8:00	40	42	42	53	39	35	27	43	40
8:30	38	39	39	44	30	52	26	38	38
9:00	42	39	53	42	38	44	25	43	40
9:30	35	37	54	39	44	46	38	42	42
10:00	41	38	31	43	28	50	37	36	38
10:30	27	47	40	49	46	50	37	42	42
11:00	33	22	36	39	46	46	30	35	36
11:30	30	52	53	41	48	39	47	45	44
12:00	38	42	43	38	48	46	39	42	42
12:30	33	47	47	47	45	37	28	44	41
13:00	27	35	46	46	34	33	42	38	38
13:30	32	52	36	49	41	32	36	42	40
14:00	34	39	41	38	43	32	37	39	38
14:30	37	38	32	37	41	26	30	37	34
15:00	31	43	25	45	57	28	40	40	38
15:30	43	59	44	57	47	36	29	50	45
16:00	36	43	38	50	38	43	33	41	40
16:30	38	33	37	42	46	31	25	39	36
17:00	24	35	45	37	31	23	34	34	33
17:30	31	29	26	35	30	28	31	30	30
18:00	22	24	37	23	36	21	29	28	27
18:30	20	15	17	23	37	28	18	22	23
19:00	22	14	14	9	15	13	13	15	14
19:30	11	13	12	12	16	15	16	13	14
20:00	13	14	14	16	9	7	7	13	11
20:30	15	12	16	16	20	17	12	16	15
21:00	11	15	17	5	9	18	10	11	12
21:30	13	14	11	7	12	4	7	11	10
22:00	14	16	12	7	7	18	10	11	12
22:30	14	6	6	3	5	16	1	7	7
23:00	8	5	11	6	6	9	5	7	7
23:30	8	8	9	5	8	6	3	8	7
Total	1041	1236	1250	1253	1184	1108	907	1193	1140
% Heavie	43.3%	50.3%	48.9%	48.9%	39.3%	39.5%	39.4%	46.3%	44.6%

Day of Week 1+2

Starting Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Ave W'day	All Days Ave	
AM Peak	79	93	101	98	84	101	88			
PM Peak	93	106	102	97	97	81	81			
0:00	3	18	22	17	6	8	18	13	13	
0:30	10	9	9	3	6	7	10	7	8	
1:00	5	7	11	14	8	10	10	9	9	
1:30	1	8	10	12	5	9	8	7	8	
2:00	5	7	11	9	5	4	5	7	7	
2:30	3	15	7	12	5	9	2	8	8	
3:00	2	8	9	5	5	9	9	6	7	
3:30	4	13	12	14	10	10	6	11	10	
4:00	10	15	15	25	10	12	8	15	14	
4:30	12	17	14	18	18	9	7	16	14	
5:00	10	30	19	23	17	19	10	20	18	
5:30	37	53	47	45	48	34	18	46	40	
6:00	61	78	95	98	59	33	30	78	65	
6:30	58	62	64	57	41	39	15	56	48	113/2 = 57vph - assume shift start at 7am
7:00	56	93	80	68	74	58	17	74	64	
7:30	62	82	92	85	62	72	43	77	71	
8:00	74	74	79	94	78	66	46	80	73	
8:30	68	80	72	88	79	101	46	77	76	
9:00	60	74	101	85	79	80	55	80	76	
9:30	76	88	95	82	84	86	78	85	84	
10:00	79	85	68	90	61	100	61	77	78	81 average (AM PEAK)
10:30	61	86	85	88	78	101	77	80	82	
11:00	73	74	69	83	84	93	61	77	77	
11:30	59	85	88	75	78	85	88	77	80	
12:00	70	75	83	86	81	71	81	79	78	
12:30	61	87	80	73	77	75	70	76	75	
13:00	65	75	102	97	74	81	77	83	82	
13:30	69	93	73	93	82	71	68	82	78	
14:00	67	80	94	80	75	63	80	79	77	
14:30	73	74	64	86	88	68	70	77	75	
15:00	64	91	64	80	91	55	73	78	74	
15:30	93	106	80	94	97	63	68	94	86	
16:00	81	85	79	84	71	67	60	80	75	81 average (PM PEAK)
16:30	71	67	67	93	78	63	59	75	71	
17:00	59	71	87	74	63	40	50	71	63	
17:30	57	66	55	61	62	46	54	60	57	
18:00	46	56	75	50	59	39	55	57	54	
18:30	45	34	38	41	61	45	32	44	42	
19:00	33	29	27	22	30	30	25	28	28	
19:30	32	31	28	25	40	29	28	31	30	
20:00	24	22	30	28	22	15	15	25	22	
20:30	36	22	27	24	32	26	24	28	27	
21:00	23	31	27	10	19	40	20	22	24	
21:30	22	28	22	16	21	15	15	22	20	
22:00	32	27	22	18	14	33	17	23	23	
22:30	30	17	20	8	16	24	10	18	18	
23:00	22	11	24	13	14	18	11	17	16	
23:30	16	12	20	9	25	13	7	16	15	
Total	2080	2451	2462	2455	2292	2144	1797	2348	2240	
% Heavie	42.2%	51.8%	50.6%	49.2%	39.8%	41.0%	41.7%	46.7%	45.2%	

Southbound

Day of Week1

Starting Time	Mon 24-Aug	Tue 25-Aug	Wed 19-Aug	Thu 20-Aug	Fri 21-Aug	Sat 22-Aug	Sun 23-Aug	Ave W'day	All Days Ave
AM Peak	41	48	51	53	50	45	47		
PM Peak	47	55	49	56	60	50	60		
0:00	3	3	3	3	8	5	3	4	4
0:30	7	4	7	7	5	9	2	6	6
1:00	2	2	4	0	3	5	8	2	3
1:30	3	5	1	5	1	8	3	3	4
2:00	0	1	4	3	3	3	3	2	2
2:30	2	7	4	1	8	6	0	4	4
3:00	2	3	2	3	2	3	1	2	2
3:30	5	4	4	9	1	2	1	5	4
4:00	3	3	2	1	3	5	1	2	3
4:30	3	3	3	3	4	3	3	3	3
5:00	6	5	11	6	7	7	0	7	6
5:30	14	13	17	12	11	7	4	13	11
6:00	19	30	23	20	20	16	12	22	20
6:30	41	38	23	23	30	26	14	31	28
7:00	24	35	25	31	29	10	12	29	24
7:30	36	46	23	42	36	18	12	37	30
8:00	33	42	41	53	33	27	16	40	35
8:30	41	40	51	37	32	24	24	40	36
9:00	36	48	39	39	29	39	25	38	36
9:30	26	44	44	44	38	43	27	39	38
10:00	37	48	32	37	31	35	34	37	36
10:30	35	41	29	40	50	45	46	39	41
11:00	29	31	41	31	39	39	47	34	37
11:30	39	43	39	35	25	33	45	36	37
12:00	30	43	22	29	46	35	31	34	34
12:30	28	40	40	41	39	44	30	38	37
13:00	30	28	32	45	34	28	35	34	33
13:30	37	50	42	39	41	28	32	42	38
14:00	39	43	40	41	40	42	40	41	41
14:30	31	49	40	51	40	40	36	42	41
15:00	32	36	41	56	49	44	42	43	43
15:30	44	42	35	40	50	35	60	42	44
16:00	47	54	38	49	48	50	42	47	47
16:30	37	51	45	41	55	40	35	46	43
17:00	39	55	49	47	60	21	22	50	42
17:30	39	38	40	34	38	32	22	38	35
18:00	37	30	24	22	36	21	27	30	28
18:30	28	15	24	22	26	18	15	23	21
19:00	16	19	22	18	20	19	13	19	18
19:30	15	16	19	23	11	18	10	17	16
20:00	15	4	13	12	12	7	9	11	10
20:30	9	15	11	15	16	17	8	13	13
21:00	16	7	16	8	9	6	8	11	10
21:30	10	8	13	18	4	8	6	11	10
22:00	7	11	13	13	8	10	8	10	10
22:30	9	5	8	6	3	6	5	6	6
23:00	9	8	7	6	5	5	3	7	6
23:30	2	1	2	4	6	1	6	3	3
Total	1052	1207	1108	1165	1144	993	888	1135	1080
% Heavies	42.6%	54.0%	53.0%	51.2%	43.7%	40.9%	37.3%	49.0%	46.6%

Day of Week2

Starting Time	Mon 31-Aug	Tue 1-Sep	Wed 26-Aug	Thu 27-Aug	Fri 28-Aug	Sat 29-Aug	Sun 30-Aug	Ave W'day	All Days Ave
AM Peak	46	59	51	60	55	63	61		
PM Peak	55	51	62	57	58	62	57		
0:00	4	6	2	4	3	2	3	4	3
0:30	2	1	1	6	0	1	3	2	2
1:00	1	4	2	2	2	8	2	2	3
1:30	3	3	3	4	1	2	1	3	2
2:00	1	3	3	5	1	6	1	3	3
2:30	0	4	9	7	4	3	4	5	4
3:00	1	3	5	7	3	2	3	4	3
3:30	1	1	6	4	5	2	5	3	3
4:00	2	3	4	4	3	2	1	3	3
4:30	6	3	5	5	4	2	6	5	4
5:00	9	11	4	8	6	5	6	8	7
5:30	18	20	13	18	16	7	6	17	14
6:00	20	25	24	20	24	14	17	23	21
6:30	37	30	33	33	27	15	7	32	26
7:00	19	37	24	23	21	13	12	25	21
7:30	32	44	33	30	38	20	16	35	30
8:00	24	55	45	50	42	26	17	43	37
8:30	46	51	45	48	32	30	25	44	40
9:00	28	43	40	34	25	30	22	34	32
9:30	23	47	51	41	55	40	50	43	44
10:00	39	59	33	42	48	46	30	44	42
10:30	37	46	36	60	48	34	41	45	43
11:00	41	47	41	35	42	32	61	41	43
11:30	33	40	38	52	35	63	47	40	44
12:00	36	38	37	37	48	48	34	39	40
12:30	29	51	43	44	43	50	41	42	43
13:00	41	36	53	30	47	45	39	41	42
13:30	40	46	35	36	38	41	42	39	40
14:00	32	47	50	41	30	62	57	40	46
14:30	41	41	47	47	33	52	40	42	43
15:00	45	40	41	45	36	41	49	41	42
15:30	41	28	44	44	46	59	41	41	43
16:00	26	42	47	47	58	35	33	44	41
16:30	55	48	50	57	56	41	26	53	48
17:00	38	49	62	40	45	31	27	47	42
17:30	33	40	21	42	35	22	29	34	32
18:00	30	32	30	40	30	21	20	32	29
18:30	21	16	23	17	18	22	12	19	18
19:00	28	18	22	17	25	15	20	22	21
19:30	19	8	15	25	20	13	14	17	16
20:00	13	6	14	14	17	8	11	13	12
20:30	13	9	10	11	17	15	7	12	12
21:00	7	7	5	9	9	15	6	7	8
21:30	13	3	8	9	8	15	9	8	9
22:00	15	11	8	11	7	6	4	10	9
22:30	5	10	12	7	2	5	3	7	6
23:00	8	2	7	6	7	7	5	6	6
23:30	8	3	5	9	5	4	3	6	5
Total	1064	1217	1189	1227	1165	1078	958	1172	1128
% Heavie	43.4%	50.0%	46.8%	47.4%	40.4%	35.3%	37.4%	45.7%	43.3%

Day of Week 1+2

Starting Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Ave W'day	All Days Ave	
AM Peak	87	107	96	103	98	96	108			
PM Peak	92	104	111	101	111	104	101			
0:00	7	9	5	7	11	7	6	8	7	
0:30	9	5	8	13	5	10	5	8	8	
1:00	3	6	6	2	5	13	10	4	6	
1:30	6	8	4	9	2	10	4	6	6	
2:00	1	4	7	8	4	9	4	5	5	
2:30	2	11	13	8	12	9	4	9	8	
3:00	3	6	7	10	5	5	4	6	6	
3:30	6	5	10	13	6	4	6	8	7	
4:00	5	6	6	5	6	7	2	6	5	
4:30	9	6	8	8	8	5	9	8	8	
5:00	15	16	15	14	13	12	6	15	13	
5:30	32	33	30	30	27	14	10	30	25	
6:00	39	55	47	40	44	30	29	45	41	
6:30	78	68	56	56	57	41	21	63	54	94/2 = 47vph - assume shift start at 7am
7:00	43	72	49	54	50	23	24	54	45	
7:30	68	90	56	72	74	38	28	72	61	
8:00	57	97	86	103	75	53	33	84	72	
8:30	87	91	96	85	64	54	49	85	75	
9:00	64	91	79	73	54	69	47	72	68	
9:30	49	91	95	85	93	83	77	83	82	
10:00	76	107	65	79	79	81	64	81	79	
10:30	72	87	65	100	98	79	87	84	84	81 average (AM PEAK)
11:00	70	78	82	66	81	71	108	75	79	
11:30	72	83	77	87	60	96	92	76	81	
12:00	66	81	59	66	94	83	65	73	73	
12:30	57	91	83	85	82	94	71	80	80	
13:00	71	64	85	75	81	73	74	75	75	
13:30	77	96	77	75	79	69	74	81	78	
14:00	71	90	90	82	70	104	97	81	86	
14:30	72	90	87	98	73	92	76	84	84	
15:00	77	76	82	101	85	85	91	84	85	
15:30	85	70	79	84	96	94	101	83	87	
16:00	73	96	85	96	106	85	75	91	88	
16:30	92	99	95	98	111	81	61	99	91	90 average (PM PEAK)
17:00	77	104	111	87	105	52	49	97	84	
17:30	72	78	61	76	73	54	51	72	66	
18:00	67	62	54	62	66	42	47	62	57	
18:30	49	31	47	39	44	40	27	42	40	
19:00	44	37	44	35	45	34	33	41	39	
19:30	34	24	34	48	31	31	24	34	32	
20:00	28	10	27	26	29	15	20	24	22	
20:30	22	24	21	26	33	32	15	25	25	
21:00	23	14	21	17	18	21	14	19	18	
21:30	23	11	21	27	12	23	15	19	19	
22:00	22	22	21	24	15	16	12	21	19	
22:30	14	15	20	13	5	11	8	13	12	
23:00	17	10	14	12	12	12	8	13	12	
23:30	10	4	7	13	11	5	9	9	8	
Total	2116	2424	2297	2392	2309	2071	1846	2308	2208	
% Heavie	43.0%	52.0%	49.8%	49.2%	42.1%	38.0%	37.3%	47.2%	44.5%	

Two ways

Day of Week1

Starting Time	Mon 24-Aug	Tue 25-Aug	Wed 19-Aug	Thu 20-Aug	Fri 21-Aug	Sat 22-Aug	Sun 23-Aug	Ave W'day	All Days Ave
AM Peak	75	95	87	94	82	96	86		
PM Peak	94	96	93	100	100	82	99		
0:00	6	15	14	11	12	11	16	12	12
0:30	12	5	9	9	7	11	6	8	8
1:00	3	5	8	9	8	12	14	7	8
1:30	3	8	5	9	3	12	6	6	7
2:00	1	4	11	8	5	4	5	6	5
2:30	2	15	5	9	11	7	2	8	7
3:00	3	4	5	6	3	8	4	4	5
3:30	6	12	9	13	4	6	4	9	8
4:00	9	12	10	15	8	13	2	11	10
4:30	9	10	9	13	14	9	5	11	10
5:00	10	19	16	18	17	17	6	16	15
5:30	31	42	41	34	37	26	14	37	32
6:00	47	66	72	68	48	39	31	60	53
6:30	68	65	52	55	53	48	22	59	52
7:00	50	73	71	62	70	27	23	65	54
7:30	69	93	70	85	66	46	30	77	66
8:00	67	74	78	94	72	58	35	77	68
8:30	71	81	84	81	81	73	44	80	74
9:00	54	83	87	82	70	75	55	75	72
9:30	67	95	85	87	78	83	67	82	80
10:00	75	95	69	84	64	85	58	77	76
10:30	69	80	74	79	82	96	86	77	81
11:00	69	83	74	75	77	86	78	76	77
11:30	68	76	74	69	55	79	86	68	72
12:00	62	76	62	77	79	60	73	71	70
12:30	56	80	73	67	71	82	72	69	72
13:00	68	68	88	96	74	76	70	79	77
13:30	74	91	79	83	82	67	64	82	77
14:00	72	84	93	83	72	73	83	81	80
14:30	67	85	72	100	87	82	76	82	81
15:00	65	84	80	91	83	71	75	81	78
15:30	94	89	71	77	100	62	99	86	85
16:00	92	96	79	83	81	74	69	86	82
16:30	70	85	75	92	87	72	69	82	79
17:00	74	91	91	84	92	38	38	86	73
17:30	65	75	69	60	70	50	45	68	62
18:00	61	62	62	49	59	39	53	59	55
18:30	53	34	45	40	50	35	29	44	41
19:00	27	34	35	31	35	36	25	32	32
19:30	36	34	35	36	35	32	22	35	33
20:00	26	12	29	24	25	15	17	23	21
20:30	30	25	22	23	28	26	20	26	25
21:00	28	23	26	13	19	28	18	22	22
21:30	19	22	24	27	13	19	14	21	20
22:00	25	22	23	24	15	25	15	22	21
22:30	25	16	22	11	14	14	14	18	17
23:00	23	14	20	13	13	14	9	17	15
23:30	10	5	13	8	23	8	10	12	11
Total	2091	2422	2320	2367	2252	2029	1778	2290	2180
% Heavies	41.8%	53.6%	52.7%	50.3%	42.1%	41.7%	40.7%	48.3%	46.6%

Day of Week2

Starting Time	Mon 31-Aug	Tue 1-Sep	Wed 26-Aug	Thu 27-Aug	Fri 28-Aug	Sat 29-Aug	Sun 30-Aug	Ave W'day	All Days Ave
AM Peak	84	97	105	109	99	102	94		
PM Peak	93	98	107	101	102	95	94		
0:00	4	12	13	13	5	4	8	9	8
0:30	7	9	8	7	4	6	9	7	7
1:00	5	8	9	7	5	11	6	7	7
1:30	4	8	9	12	4	7	6	7	7
2:00	5	7	7	9	4	9	4	6	6
2:30	3	11	15	11	6	11	4	9	9
3:00	2	10	11	9	7	6	9	8	8
3:30	4	6	13	14	12	8	8	10	9
4:00	6	9	11	15	8	6	8	10	9
4:30	12	13	13	13	12	5	11	13	11
5:00	15	27	18	19	13	14	10	18	17
5:30	38	44	36	41	38	22	14	39	33
6:00	53	67	70	70	55	24	28	63	52
6:30	68	65	68	58	45	32	14	61	50
7:00	49	92	58	60	54	54	18	63	55
7:30	61	79	78	72	70	64	41	72	66
8:00	64	97	87	103	81	61	44	86	77
8:30	84	90	84	92	62	82	51	82	78
9:00	70	82	93	76	63	74	47	77	72
9:30	58	84	105	80	99	86	88	85	86
10:00	80	97	64	85	76	96	67	80	81
10:30	64	93	76	109	94	84	78	87	85
11:00	74	69	77	74	88	78	91	76	79
11:30	63	92	91	93	83	102	94	84	88
12:00	74	80	80	75	96	94	73	81	82
12:30	62	98	90	91	88	87	69	86	84
13:00	68	71	99	76	81	78	81	79	79
13:30	72	98	71	85	79	73	78	81	79
14:00	66	86	91	79	73	94	94	79	83
14:30	78	79	79	84	74	78	70	79	77
15:00	76	83	66	90	93	69	89	82	81
15:30	84	87	88	101	93	95	70	91	88
16:00	62	85	85	97	96	78	66	85	81
16:30	93	81	87	99	102	72	51	92	84
17:00	62	84	107	77	76	54	61	81	74
17:30	64	69	47	77	65	50	60	64	62
18:00	52	56	67	63	66	42	49	61	56
18:30	41	31	40	40	55	50	30	41	41
19:00	50	32	36	26	40	28	33	37	35
19:30	30	21	27	37	36	28	30	30	30
20:00	26	20	28	30	26	15	18	26	23
20:30	28	21	26	27	37	32	19	28	27
21:00	18	22	22	14	18	33	16	19	20
21:30	26	17	19	16	20	19	16	20	19
22:00	29	27	20	18	14	24	14	22	21
22:30	19	16	18	10	7	21	4	14	14
23:00	16	7	18	12	13	16	10	13	13
23:30	16	11	14	14	13	10	6	14	12
Total	2105	2453	2439	2480	2349	2186	1865	2365	2268
% Heavie	43.4%	50.2%	47.8%	48.1%	39.8%	37.4%	38.3%	46.0%	43.9%

Day of Week 1+2

Starting Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Ave W'day	All Days Ave	
AM Peak	155	192	190	197	177	181	180			
PM Peak	178	189	198	191	193	169	177			
0:00	10	27	27	24	17	15	24	21	21	
0:30	19	14	17	16	11	17	15	15	16	
1:00	8	13	17	16	13	23	20	13	16	
1:30	7	16	14	21	7	19	12	13	14	
2:00	6	11	18	17	9	13	9	12	12	
2:30	5	26	20	20	17	18	6	18	16	
3:00	5	14	16	15	10	14	13	12	12	
3:30	10	18	22	27	16	14	12	19	17	
4:00	15	21	21	30	16	19	10	21	19	
4:30	21	23	22	26	26	14	16	24	21	
5:00	25	46	34	37	30	31	16	34	31	
5:30	69	86	77	75	75	48	28	76	65	
6:00	100	133	142	138	103	63	59	123	105	
6:30	136	130	120	113	98	80	36	119	102	
7:00	99	165	129	122	124	81	41	128	109	
7:30	130	172	148	157	136	110	71	149	132	
8:00	131	171	165	197	153	119	79	163	145	
8:30	155	171	168	173	143	155	95	162	151	
9:00	124	165	180	158	133	149	102	152	144	
9:30	125	179	190	167	177	169	155	168	166	
10:00	155	192	133	169	140	181	125	158	156	AM Peak = 323/2 = 162
10:30	133	173	150	188	176	180	164	164	166	
11:00	143	152	151	149	165	164	169	152	156	
11:30	131	168	165	162	138	181	180	153	161	
12:00	136	156	142	152	175	154	146	152	152	
12:30	118	178	163	158	159	169	141	155	155	
13:00	136	139	187	172	155	154	151	158	156	
13:30	146	189	150	168	161	140	142	163	157	
14:00	138	170	184	162	145	167	177	160	163	
14:30	145	164	151	184	161	160	146	161	159	
15:00	141	167	146	181	176	140	164	162	159	
15:30	178	176	159	178	193	157	169	177	173	PM Peak = 336/2 = 168
16:00	154	181	164	180	177	152	135	171	163	
16:30	163	166	162	191	189	144	120	174	162	
17:00	136	175	198	161	168	92	99	168	147	
17:30	129	144	116	137	135	100	105	132	124	
18:00	113	118	129	112	125	81	102	119	111	
18:30	94	65	85	80	105	85	59	86	82	
19:00	77	66	71	57	75	64	58	69	67	
19:30	66	55	62	73	71	60	52	65	63	
20:00	52	32	57	54	51	30	35	49	44	
20:30	58	46	48	50	65	58	39	53	52	
21:00	46	45	48	27	37	61	34	41	43	
21:30	45	39	43	43	33	38	30	41	39	
22:00	54	49	43	42	29	49	29	43	42	
22:30	44	32	40	21	21	35	18	32	30	
23:00	39	21	38	25	26	30	19	30	28	
23:30	26	16	27	22	36	18	16	25	23	
Total	4196	4875	4759	4847	4601	4215	3643	4656	4448	
% Heavie	42.6%	51.9%	50.2%	49.2%	40.9%	39.5%	39.5%	47.0%	44.8%	

austraffic

Road	Back Tomingley Rd
Location	Near Newell Hwy Intersection
Site No.	9109_2
Start Date	Wednesday 19 Aug 2020
Suburb	Tomingley

Northbound

Starting Time	Day of Week1 Mon 24-Aug	Tue 25-Aug	Wed 19-Aug	Thu 20-Aug	Fri 21-Aug	Sat 22-Aug	Sun 23-Aug	Ave W'day	All Days Ave
AM Peak	4	4	1	2	1	3	1		
PM Peak	1	3	1	1	1	1	1		
0:00	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0
2:00	0	0	1	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0
6:00	1	0	0	0	0	0	0	0	0
6:30	0	4	0	0	0	0	1	1	1
7:00	0	0	1	0	1	0	1	0	0
7:30	4	0	0	0	0	1	1	1	1
8:00	0	1	0	2	0	0	1	1	1
8:30	1	1	1	2	1	0	0	1	1
9:00	0	0	0	1	0	1	0	0	0
9:30	2	2	0	0	0	3	0	1	1
10:00	0	2	0	0	0	0	0	0	0
10:30	0	1	0	0	0	0	0	0	0
11:00	1	0	1	0	0	1	0	0	0
11:30	2	0	0	0	0	0	0	0	0
12:00	0	0	1	0	0	1	0	0	0
12:30	1	0	0	0	0	0	0	0	0
13:00	0	3	1	0	0	0	1	1	1
13:30	1	0	0	0	0	0	0	0	0
14:00	1	0	0	0	0	0	0	0	0
14:30	0	1	0	0	0	0	0	0	0
15:00	1	0	0	0	0	0	0	0	0
15:30	1	0	0	0	1	0	0	0	0
16:00	0	0	0	1	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	1	0	0	0
19:00	0	0	0	0	0	0	0	0	0
19:30	1	0	1	0	0	1	1	0	1
20:00	0	0	0	0	0	0	0	0	0
20:30	1	0	0	0	0	0	0	0	0
21:00	0	0	0	0	1	0	0	0	0
21:30	0	1	0	0	0	0	0	0	0
22:00	0	0	0	0	1	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0
Total	18	16	7	6	5	9	6	10	10
% Heavies	5.6%	18.8%	0.0%	0.0%	0.0%	0.0%	0.0%	7.7%	6.0%

Starting Time	Day of Week2 Mon 31-Aug	Tue 1-Sep	Wed 2-Sep	Thu 3-Sep	Fri 4-Sep	Sat 5-Sep	Sun 6-Sep	Ave W'day	All Days Ave
AM Peak	1	2	1	1	2	1	2		
PM Peak	2	2	2	4	1	1	2		
0:00	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0	0
7:00	1	0	1	0	0	0	0	0	0
7:30	1	1	0	0	1	0	0	1	0
8:00	0	1	0	0	0	1	1	0	0
8:30	0	0	1	1	0	0	0	0	0
9:00	0	1	1	1	0	0	1	1	1
9:30	0	0	0	1	0	0	0	0	0
10:00	0	0	0	0	0	1	0	0	0
10:30	0	0	1	0	0	0	0	0	0
11:00	0	0	0	0	0	0	2	0	0
11:30	1	2	1	0	2	0	1	1	1
12:00	1	1	0	0	1	0	1	1	1
12:30	0	1	0	0	0	0	0	0	0
13:00	0	0	1	4	0	1	0	1	1
13:30	0	0	2	2	0	0	0	1	1
14:00	0	0	0	1	0	0	1	0	0
14:30	0	0	0	0	1	0	0	0	0
15:00	0	0	0	0	0	0	2	0	0
15:30	0	0	0	0	0	0	0	0	0
16:00	1	0	0	0	0	1	0	0	0
16:30	2	0	0	0	1	1	0	1	1
17:00	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0
18:00	0	0	1	0	1	0	0	0	0
18:30	0	2	0	0	0	0	1	0	0
19:00	1	0	0	0	0	1	0	0	0
19:30	0	0	0	0	0	0	0	0	0
20:00	0	0	0	1	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0
Total	8	9	9	11	7	6	10	9	9
% Heavie	12.5%	0.0%	22.2%	9.1%	14.3%	0.0%	0.0%	11.4%	8.3%

Starting Time	Day of Week 1+2 Mon	Tue	Wed	Thu	Fri	Sat	Sun	Ave W'day	All Days Ave
AM Peak	5	4	2	3	2	3	2		
PM Peak	2	3	2	4	1	1	2		
0:00	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0
2:00	0	0	1	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0
6:00	1	0	0	0	0	0	0	0	0
6:30	0	4	0	0	0	0	1	1	1
7:00	1	0	2	0	1	0	1	1	1
7:30	5	1	0	0	1	1	1	1	1
8:00	0	2	0	2	0	1	2	1	1
8:30	1	1	2	3	1	0	0	2	1
9:00	0	1	1	2	0	1	1	1	1
9:30	2	2	0	1	0	3	0	1	1
10:00	0	2	0	0	0	1	0	0	0
10:30	0	1	1	0	0	0	0	0	0
11:00	1	0	1	0	0	1	2	0	1
11:30	3	2	1	0	2	0	1	2	1
12:00	1	1	1	0	1	1	1	1	1
12:30	1	1	0	0	0	0	0	0	0
13:00	0	3	2	4	0	1	1	2	2
13:30	1	0	2	2	0	0	0	1	1
14:00	1	0	0	1	0	0	1	0	0
14:30	0	1	0	0	1	0	0	0	0
15:00	1	0	0	0	0	0	2	0	0
15:30	1	0	0	0	1	0	0	0	0
16:00	1	0	0	1	0	1	0	0	0
16:30	2	0	0	0	1	1	0	1	1
17:00	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0
18:00	0	0	1	0	1	0	0	0	0
18:30	0	2	0	0	0	1	1	0	1
19:00	1	0	0	0	0	1	0	0	0
19:30	1	0	1	0	0	1	1	0	1
20:00	0	0	0	1	0	0	0	0	0
20:30	1	0	0	0	0	0	0	0	0
21:00	0	0	0	0	1	0	0	0	0
21:30	0	1	0	0	0	0	0	0	0
22:00	0	0	0	0	1	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0
Total	26	25	16	17	12	15	16	19	18
% Heavie	7.7%	12.0%	12.5%	5.9%	8.3%	0.0%	0.0%	9.3%	6.6%

Southbound

Starting Time	Day of Week1 Mon 24-Aug	Tue 25-Aug	Wed 19-Aug	Thu 20-Aug	Fri 21-Aug	Sat 22-Aug	Sun 23-Aug	Ave W'day	All Days Ave
AM Peak	1	1	1	1	1	3	1		
PM Peak	3	2	1	1	1	2	0		
0:00	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0
6:00	0	0	0	1	0	1	0	0	0
6:30	0	1	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0	0
7:30	1	0	0	0	1	0	1	0	0
8:00	0	1	0	0	0	1	0	0	0
8:30	0	0	0	0	1	0	0	0	0
9:00	0	0	0	0	0	0	1	0	0

Starting Time	Day of Week2 Mon 31-Aug	Tue 1-Sep	Wed 2-Sep	Thu 3-Sep	Fri 4-Sep	Sat 5-Sep	Sun 6-Sep	Ave W'day	All Days Ave
AM Peak	1	1	3	1	2	1	1		
PM Peak	3	2	2	2	2	1	1		
0:00	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	1	0	0	0
1:00	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0
6:30	1	1	0	1	1	0	0	1	1
7:00	0	0	1	0	0	0	0	0	0
7:30	1	0	1	0	0	0	0	0	0
8:00	0	0	0	0	2	0	0	0	0
8:30	1	1	0	0	1	1	1	1	1
9:00	0	0	0	1	0	0	0	0	0

Starting Time	Day of Week 1+2 Mon	Tue	Wed	Thu	Fri	Sat	Sun	Ave W'day	All Days Ave
AM Peak	2	2	3	1	2	3	1		
PM Peak	4	2	2	2	2	2	1		
0:00	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	1	0	0	0
1:00	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0
6:00	0	0	0	1	0	1	0	0	0
6:30	1	2	0	1	1	0	0	1	1
7:00	0	0	1	0	0	0	0	0	0
7:30	2	0	1	0	1	0	1	1	1
8:00	0	1	0	0	2	1	0	1	1
8:30	1	1	0	0	2	1	1	1	1
9:00	0	0	0	1	0	0	1	0	0

9:30	0	0	1	0	0	1	0	0	0
10:00	0	1	0	1	0	3	0	0	1
10:30	0	0	0	0	1	0	0	0	0
11:00	1	1	0	0	0	0	0	0	0
11:30	0	0	0	1	0	0	0	0	0
12:00	2	1	0	1	0	0	0	1	1
12:30	0	0	1	0	0	1	0	0	0
13:00	0	0	0	1	0	2	0	0	0
13:30	0	1	1	0	0	0	0	0	0
14:00	1	0	0	0	0	0	0	0	0
14:30	1	2	0	0	0	0	0	1	0
15:00	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0
16:00	3	0	1	0	0	0	0	1	1
16:30	0	2	0	0	0	0	0	0	0
17:00	0	1	0	0	0	0	0	0	0
17:30	0	0	0	1	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0
19:30	1	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0
20:30	0	0	1	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	1	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0
Total	10	11	5	6	4	9	2	7	7
% Heavies	20.0%	45.5%	60.0%	33.3%	0.0%	0.0%	0.0%	33.3%	25.5%

9:30	0	1	1	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0
10:30	0	1	3	1	0	1	1	1	1
11:00	1	0	0	0	0	0	0	0	0
11:30	1	1	0	0	0	0	0	0	0
12:00	0	1	0	1	1	0	0	1	0
12:30	1	0	0	1	2	0	1	1	1
13:00	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	1	1	0	0
14:00	0	0	0	1	0	0	0	0	0
14:30	0	0	0	0	1	0	0	0	0
15:00	3	2	0	0	0	0	0	1	1
15:30	0	0	2	0	0	0	0	0	0
16:00	1	2	0	2	0	1	0	1	1
16:30	1	0	0	0	0	0	1	0	0
17:00	1	1	0	0	1	1	1	1	1
17:30	0	0	0	0	0	0	0	0	0
18:00	1	0	0	0	1	0	1	0	0
18:30	0	0	0	0	1	0	1	0	0
19:00	0	0	0	0	0	0	0	0	0
19:30	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0
Total	13	11	8	8	11	6	8	10	9
% Heavie	15.4%	9.1%	12.5%	12.5%	0.0%	0.0%	0.0%	9.8%	7.7%

9:30	0	1	2	0	0	1	0	1	1
10:00	0	1	0	1	0	3	0	0	1
10:30	0	1	3	1	1	1	1	1	1
11:00	2	1	0	0	0	0	0	1	0
11:30	1	1	0	1	0	0	0	1	0
12:00	2	2	0	2	1	0	0	1	1
12:30	1	0	1	1	2	1	1	1	1
13:00	0	0	0	1	0	2	0	0	0
13:30	0	1	1	0	0	1	1	0	1
14:00	1	0	0	1	0	0	0	0	0
14:30	1	2	0	0	1	0	0	1	1
15:00	3	2	0	0	0	0	0	1	1
15:30	0	0	2	0	0	0	0	0	0
16:00	4	2	1	2	0	1	0	2	1
16:30	1	2	0	0	0	0	1	1	1
17:00	1	2	0	0	1	1	1	1	1
17:30	0	0	0	1	0	0	0	0	0
18:00	1	0	0	0	1	0	1	0	0
18:30	0	0	0	0	1	0	1	0	0
19:00	0	0	0	0	0	0	0	0	0
19:30	1	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0
20:30	0	0	1	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	1	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0
Total	23	22	13	14	15	15	10	17	16
% Heavie	17.4%	27.3%	30.8%	21.4%	0.0%	0.0%	0.0%	19.4%	13.8%

Two ways

Starting Time	Day of Week1							Ave W'day	All Days Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	24-Aug	25-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug		
AM Peak	5	5	1	2	2	4	2		
PM Peak	3	3	1	1	1	2	1		
0:00	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0
2:00	0	0	1	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0
6:00	1	0	0	1	0	1	0	0	0
6:30	0	5	0	0	0	0	1	1	1
7:00	0	0	1	0	1	0	1	0	0
7:30	5	0	0	0	1	1	2	1	1
8:00	0	2	0	2	0	1	1	1	1
8:30	1	1	1	2	2	0	0	1	1
9:00	0	0	0	1	0	1	1	0	0
9:30	2	2	1	0	0	4	0	1	1
10:00	0	3	0	1	0	3	0	1	1
10:30	0	1	0	0	1	0	0	0	0
11:00	2	1	1	0	0	1	0	1	1
11:30	2	0	0	1	0	0	0	1	0
12:00	2	1	1	1	0	1	0	1	1
12:30	1	0	1	0	0	1	0	0	0
13:00	0	3	1	1	0	2	1	1	1
13:30	1	1	1	0	0	0	0	1	0
14:00	2	0	0	0	0	0	0	0	0
14:30	1	3	0	0	0	0	0	1	1
15:00	1	0	0	0	0	0	0	0	0
15:30	1	0	0	0	1	0	0	0	0
16:00	3	0	1	1	0	0	0	1	1
16:30	0	2	0	0	0	0	0	0	0
17:00	0	1	0	0	0	0	0	0	0
17:30	0	0	0	1	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	1	0	0	0
19:00	0	0	0	0	0	0	0	0	0
19:30	2	0	1	0	0	1	1	1	1
20:00	0	0	0	0	0	0	0	0	0
20:30	1	0	1	0	0	0	0	0	0
21:00	0	0	0	0	1	0	0	0	0
21:30	0	1	0	0	0	0	0	0	0
22:00	0	0	0	0	1	0	0	0	0
22:30	0	0	0	0	1	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0
Total	28	27	12	12	9	18	8	18	16
% Heavies	10.7%	29.6%	25.0%	16.7%	0.0%	0.0%	0.0%	18.2%	14.0%

Starting Time	Day of Week2							Ave W'day	All Days Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	31-Aug	1-Sep	2-Sep	3-Sep	4-Sep	5-Sep	6-Sep		
AM Peak	2	3	4	2	2	1	2		
PM Peak	3	2	2	4	2	2	2		
0:00	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	1	0	0	0
1:00	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0
6:30	1	1	0	1	1	0	0	1	1
7:00	1	0	2	0	0	0	0	1	0
7:30	2	1	1	0	1	0	0	1	1
8:00	0	1	0	0	2	1	1	1	1
8:30	1	1	1	1	1	1	1	1	1
9:00	0	1	1	2	0	0	1	1	1
9:30	0	1	1	1	0	0	0	1	0
10:00	0	0	0	0	0	1	0	0	0
10:30	0	1	4	1	0	1	1	1	1
11:00	1	0	0	0	0	0	2	0	0
11:30	2	3	1	0	2	0	1	2	1
12:00	1	2	0	1	2	0	1	1	1
12:30	1	1	0	1	2	0	1	1	1
13:00	0	0	1	4	0	1	0	1	1
13:30	0	0	2	2	0	1	1	1	1
14:00	0	0	0	2	0	0	1	0	0
14:30	0	0	0	0	2	0	0	0	0
15:00	3	2	0	0	0	0	2	1	1
15:30	0	0	2	0	0	0	0	0	0
16:00	2	2	0	2	0	2	0	1	1
16:30	3	0	0	0	1	1	1	1	1
17:00	1	1	0	0	1	1	1	1	1
17:30	0	0	0	0	0	0	0	0	0
18:00	1	0	1	0	2	0	1	1	1
18:30	0	2	0	0	1	0	2	1	1
19:00	1	0	0	0	0	1	0	0	0
19:30	0	0	0	0	0	0	0	0	0
20:00	0	0	0	1	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0
Total	21	20	17	19	18	12	18	19	18
% Heavie	14.3%	5.0%	17.6%	10.5%	5.6%	0.0%	0.0%	10.5%	8.0%

Starting Time	Day of Week 1+2							Ave W'day	All Days Ave	
	Mon	Tue	Wed	Thu	Fri	Sat	Sun			
AM Peak	7	6	4	3	3	4	2			
PM Peak	5	3	3	5	2	3	2			
0:00	0	0	0	0	0	0	0	0	0	
0:30	0	0	0	0	0	1	0	0	0	
1:00	0	0	0	0	0	0	0	0	0	
1:30	0	0	0	0	0	0	0	0	0	
2:00	0	0	1	0	0	0	0	0	0	
2:30	0	0	0	0	0	0	0	0	0	
3:00	0	0	0	0	0	0	0	0	0	
3:30	0	0	0	0	0	0	0	0	0	
4:00	0	0	0	0	0	0	0	0	0	
4:30	0	0	0	0	0	0	0	0	0	
5:00	0	0	0	0	0	0	0	0	0	
5:30	0	0	0	0	0	0	0	0	0	
6:00	1	0	0	1	0	1	0	0	0	
6:30	1	6	0	1	1	0	1	2	1	
7:00	1	0	3	0	1	0	1	1	1	
7:30	7	1	1	0	2	1	2	2	2	
8:00	0	3	0	2	2	2	2	1	2	Peak AM = 4
8:30	2	2	2	3	3	1	1	2	2	
9:00	0	1	1	3	0	1	2	1	1	
9:30	2	3	2	1	0	4	0	2	2	
10:00	0	3	0	1	0	4	0	1	1	
10:30	0	2	4	1	1	1	1	2	1	
11:00	3	1	1	0	0	1	2	1	1	
11:30	4	3	1	1	2	0	1	2	2	
12:00	3	3	1	2	2	1	1	2	2	
12:30	2	1	1	1	2	1	1	1	1	
13:00	0	3	2	5	0	3	1	2	2	
13:30	1	1	3	2	0	1	1	1	1	
14:00	2	0	0	2	0	0	1	1	1	
14:30	1	3	0	0	2	0	0	1	1	
15:00	4	2	0	0	0	0	2	1	1	
15:30	1	0	2	0	1	0	0	1	1	
16:00	5	2	1	3	0	2	0	2	2	Peak PM = 3
16:30	3	2	0	0	1	1	1	1	1	
17:00	1	2	0	0	1	1	1	1	1	
17:30	0	0	0	1	0	0	0	0	0	
18:00	1	0	1	0	2	0	1	1	1	
18:30	0	2	0	0	1	1	2	1	1	
19:00	1	0	0	0	0	1	0	0	0	
19:30	2	0	1	0	0	1	1	1	1	
20:00	0	0	0	1	0	0	0	0	0	
20:30	1	0	1	0	0	0	0	0	0	
21:00	0	0	0	0	1	0	0	0	0	
21:30	0	1	0	0	0	0	0	0	0	
22:00	0	0	0	0	1	0	0	0	0	
22:30	0	0	0	0	1	0	0	0	0	
23:00	0	0	0	0	0	0	0	0	0	
23:30	0	0	0	0	0	0	0	0	0	
Total	49	47	29	31	27	30	26	37	34	
% Heavie	12.2%	19.1%	20.7%	12.9%	3.7%	0.0%	0.0%	13.7%	9.8%	

616 **Kyalite Road Traffic Data**

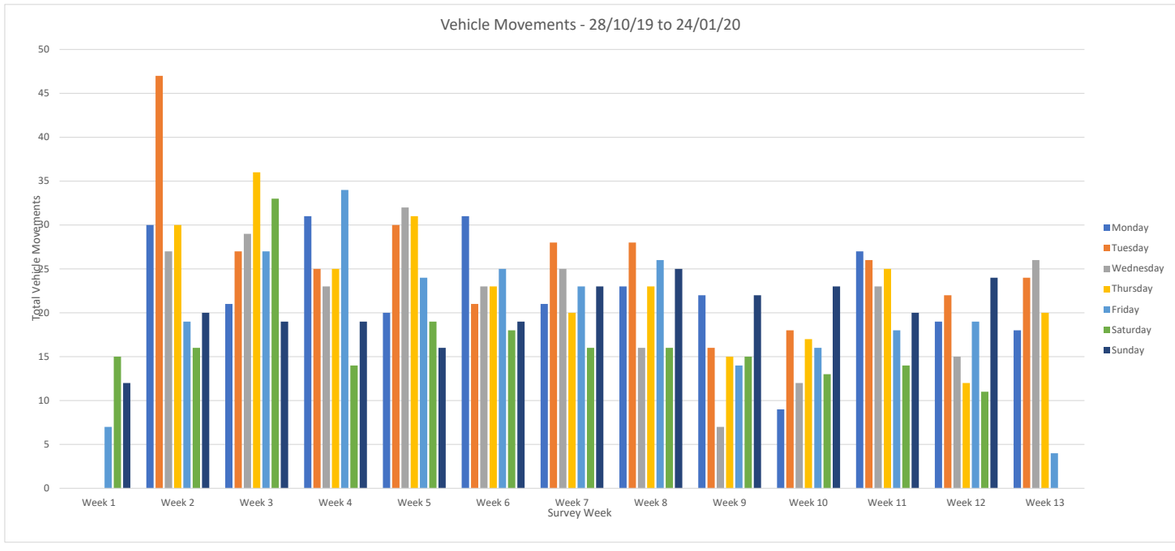
Survey Duration 1 November 2019 to 24 January 2020 (i.e. 57 days or 55 full days)
Site: Kyalite Road / Newell Highway Intersection
Direction: East = East Bound
West = West Bound
Status: I = Incomplete, C = Complete

Report: Daily Class By Direction

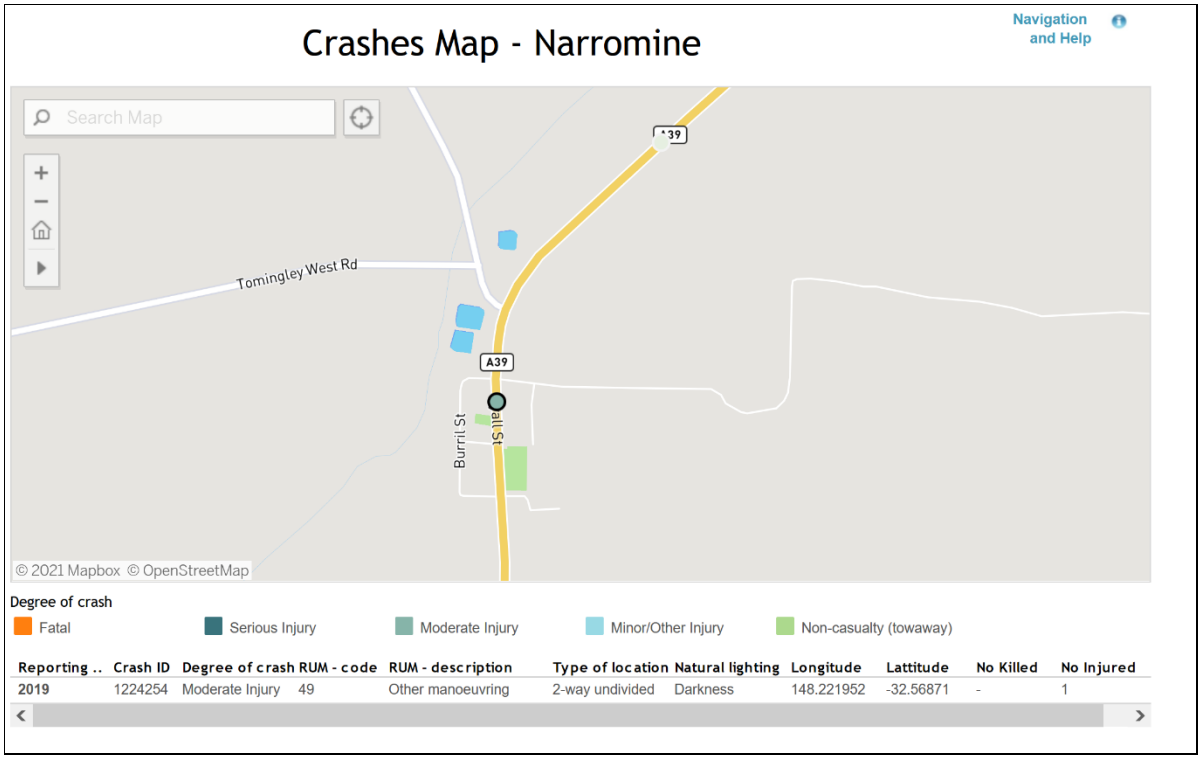
Week No.	Start	End	Data (C/I)*	Monday			Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			Total - Week Days			Total - Weekends			Total - Whole Week			Daily Average		
				Total	East	West	Total	East	West	Total	East	West	Total	East	West	Total	East	West	Total	East	West	Total	East	West	Total	East	West	Total	East	West	Total	East	West	Total	East	West
Week 1	28/10/2019	3/11/2019	I	0	0	0	0	0	0	0	0	0	0	0	0	7	1	6	15	9	6	12	6	6	7	1	6	27	15	12	34	16	18	5	2	3
Week 2	4/11/2019	10/11/2019	C	30	17	12	47	24	23	27	14	13	30	15	15	19	11	8	16	8	8	20	9	11	153	81	71	36	17	19	189	98	90	27	14	13
Week 3	11/11/2019	17/11/2019	C	21	11	10	27	14	13	29	15	14	36	17	19	27	14	13	33	16	17	19	8	11	140	71	69	52	24	28	192	95	97	27	14	14
Week 4	18/11/2019	24/11/2019	C	31	18	13	25	12	13	23	12	11	25	12	13	34	18	16	14	7	7	19	8	11	138	72	66	33	15	18	171	87	84	24	12	12
Week 5	25/11/2019	1/12/2019	C	20	11	9	30	15	15	32	16	16	31	16	15	24	13	11	19	10	9	16	7	9	137	71	66	35	17	18	172	88	84	25	13	12
Week 6	2/12/2019	8/12/2019	C	31	17	14	21	11	10	23	13	10	23	12	11	25	12	13	18	9	9	19	9	10	123	65	58	37	18	19	160	83	77	23	12	11
Week 7	9/12/2019	15/12/2019	C	21	9	12	28	12	16	25	14	11	20	9	11	23	14	9	16	8	8	23	12	11	117	58	59	39	20	19	156	78	78	22	11	11
Week 8	16/12/2019	22/12/2019	C	23	12	11	28	15	13	16	7	9	23	12	11	26	14	12	16	9	7	25	10	15	116	60	56	41	19	22	157	79	78	22	11	11
Week 9	23/12/2019	29/12/2019	C	22	12	10	16	9	7	7	3	4	15	8	7	14	7	7	15	7	8	22	10	12	74	39	35	37	17	20	111	56	55	16	8	8
Week 10	30/12/2019	5/01/2020	C	9	5	4	18	10	8	12	5	7	17	8	9	16	9	7	13	6	7	23	10	13	72	37	35	36	16	20	108	53	55	15	8	8
Week 11	6/01/2020	12/01/2020	C	27	15	12	26	12	14	23	12	11	25	12	13	18	11	7	14	8	6	20	11	9	119	62	57	34	19	15	153	81	72	22	12	10
Week 12	13/01/2020	19/01/2020	C	19	11	8	22	13	9	15	7	8	12	6	6	19	11	8	11	5	6	24	12	12	87	48	39	35	17	18	122	65	57	17	9	8
Week 13	20/01/2020	24/01/2020	I	18	10	8	24	11	13	26	14	12	20	11	9	4	4	0	0	0	0	0	0	0	92	50	42	0	0	0	92	50	42	13	7	6
Complete Week Data Only	Minimum			9	5	4	16	9	7	7	3	4	12	6	6	14	7	7	11	5	6	16	7	9	72	37	35	33	15	15	108	53	55	15	8	8
	Maximum			31	18	14	47	24	23	32	16	16	36	17	19	34	18	16	33	16	17	25	12	15	153	81	71	52	24	28	192	98	97	27	14	14
	Mean			23	13	10	26	13	13	21	11	10	23	12	12	22	12	10	17	8	8	21	10	11	116	60	56	38	18	20	154	78	75	22	11	11
	Median			22	12	11	26	12	13	23	12	11	23	12	11	23	12	9	16	8	8	20	10	11	119	62	58	36	17	19	157	81	78	22	12	11

*C = Complete weekly data, I = Incomplete weekly data.

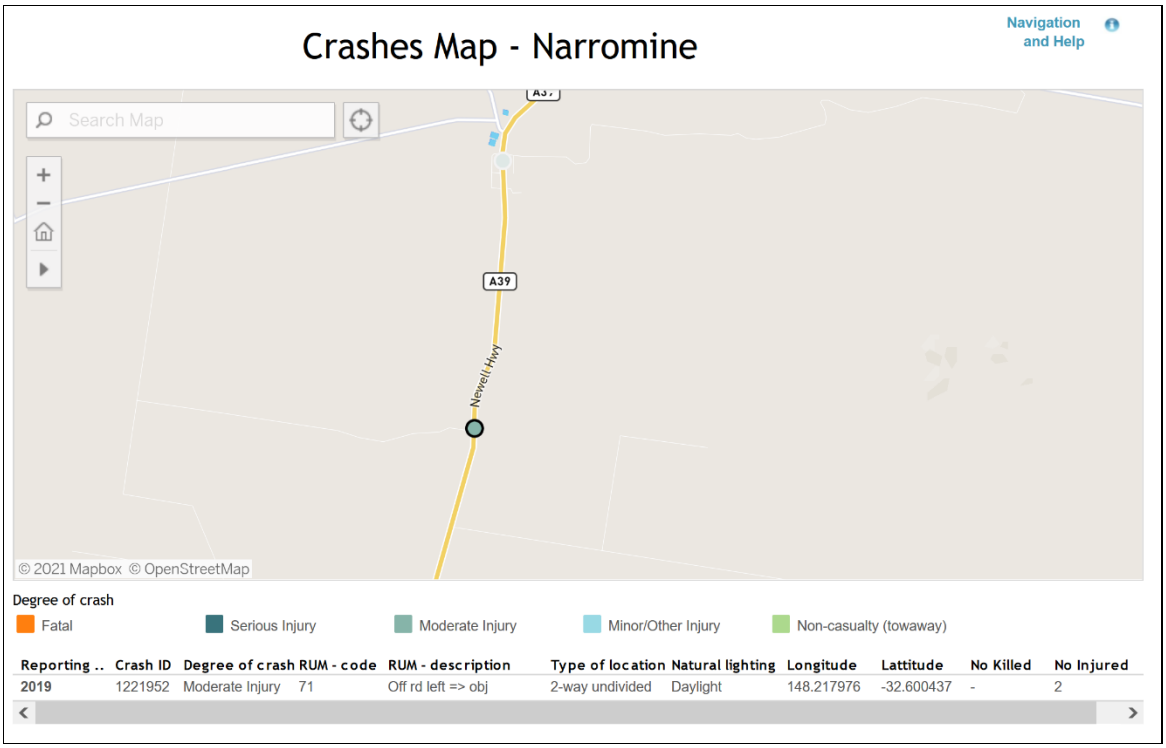
Mon Tue Wed Thu Fri Sat Sun



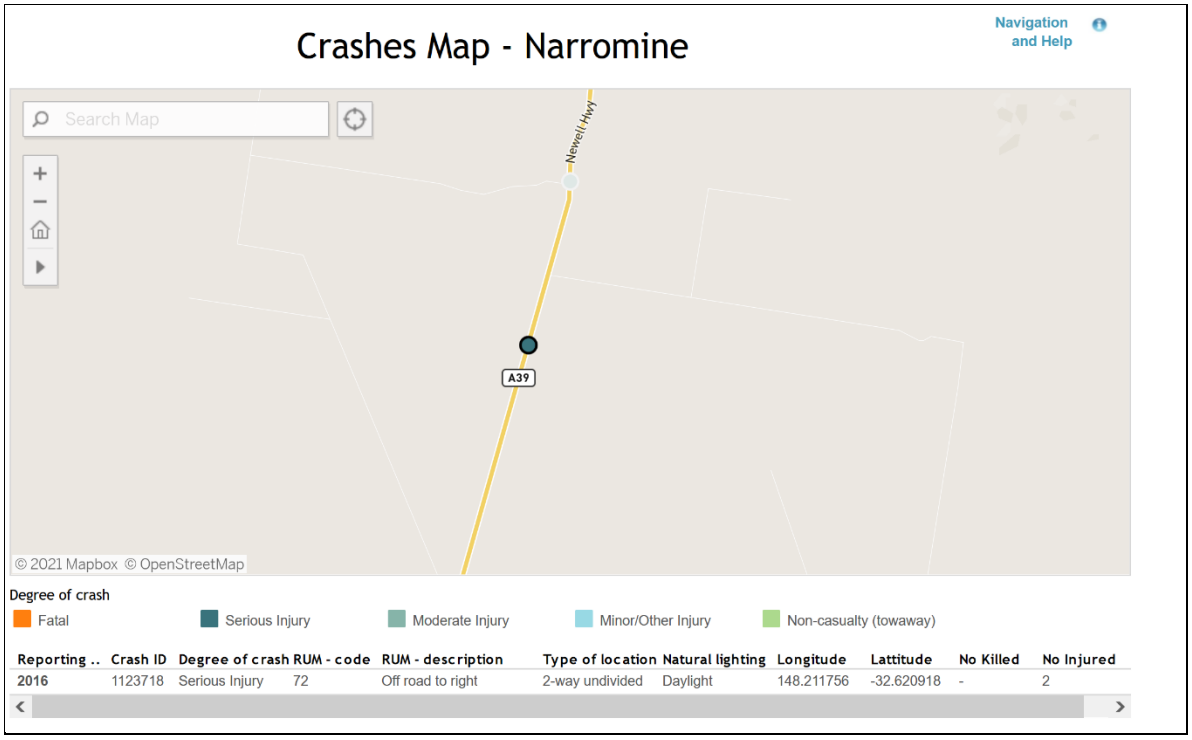
Appendix 2: HW17 Crash Data



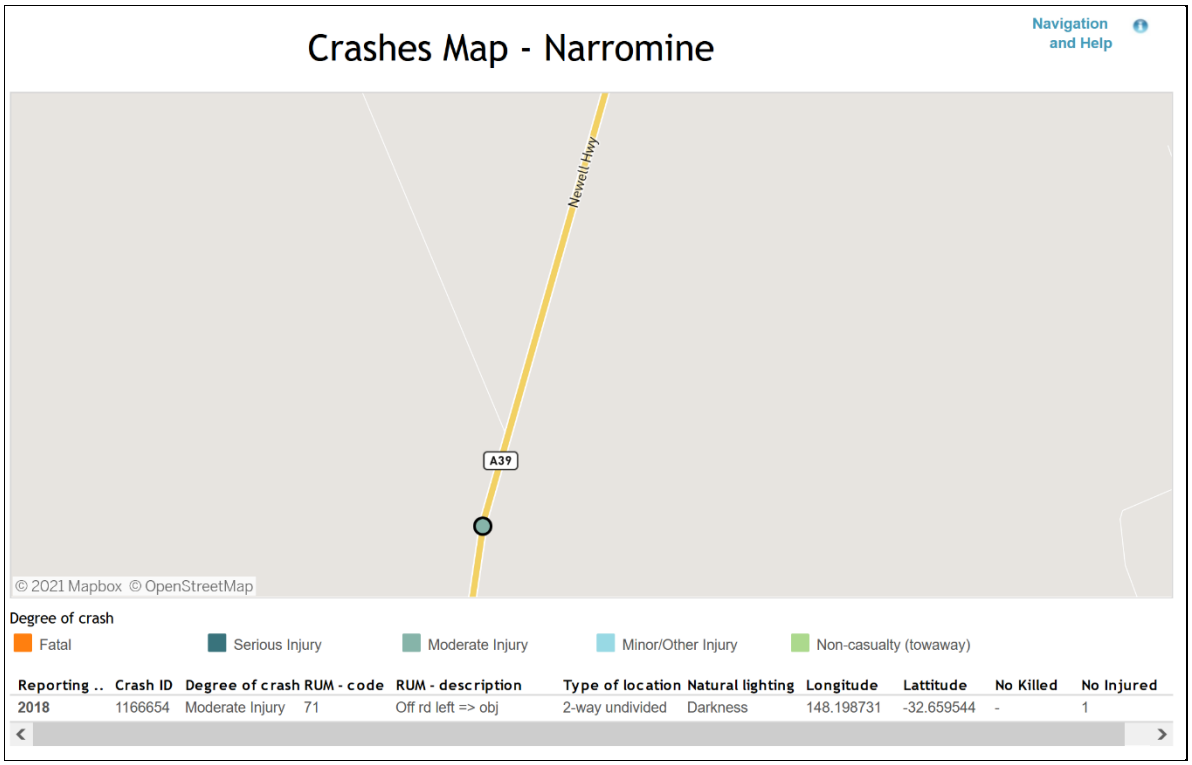
Reporting ..	Crash ID	Degree of crash	RUM - code	RUM - description	Type of location	Natural lighting	Longitude	Lattitude	No Killed	No Injured
2019	1224254	Moderate Injury	49	Other manoeuvring	2-way undivided	Darkness	148.221952	-32.56871	-	1



Reporting ..	Crash ID	Degree of crash	RUM - code	RUM - description	Type of location	Natural lighting	Longitude	Lattitude	No Killed	No Injured
2019	1221952	Moderate Injury	71	Off rd left => obj	2-way undivided	Daylight	148.217976	-32.600437	-	2



Reporting ..	Crash ID	Degree of crash	RUM - code	RUM - description	Type of location	Natural lighting	Longitude	Lattitude	No Killed	No Injured
2016	1123718	Serious Injury	72	Off road to right	2-way undivided	Daylight	148.211756	-32.620918	-	2



Reporting ..	Crash ID	Degree of crash	RUM - code	RUM - description	Type of location	Natural lighting	Longitude	Lattitude	No Killed	No Injured
2018	1166654	Moderate Injury	71	Off rd left => obj	2-way undivided	Darkness	148.198731	-32.659544	-	1

Appendix 3: HW17 Realignment – 50% Concept Design (Extract)

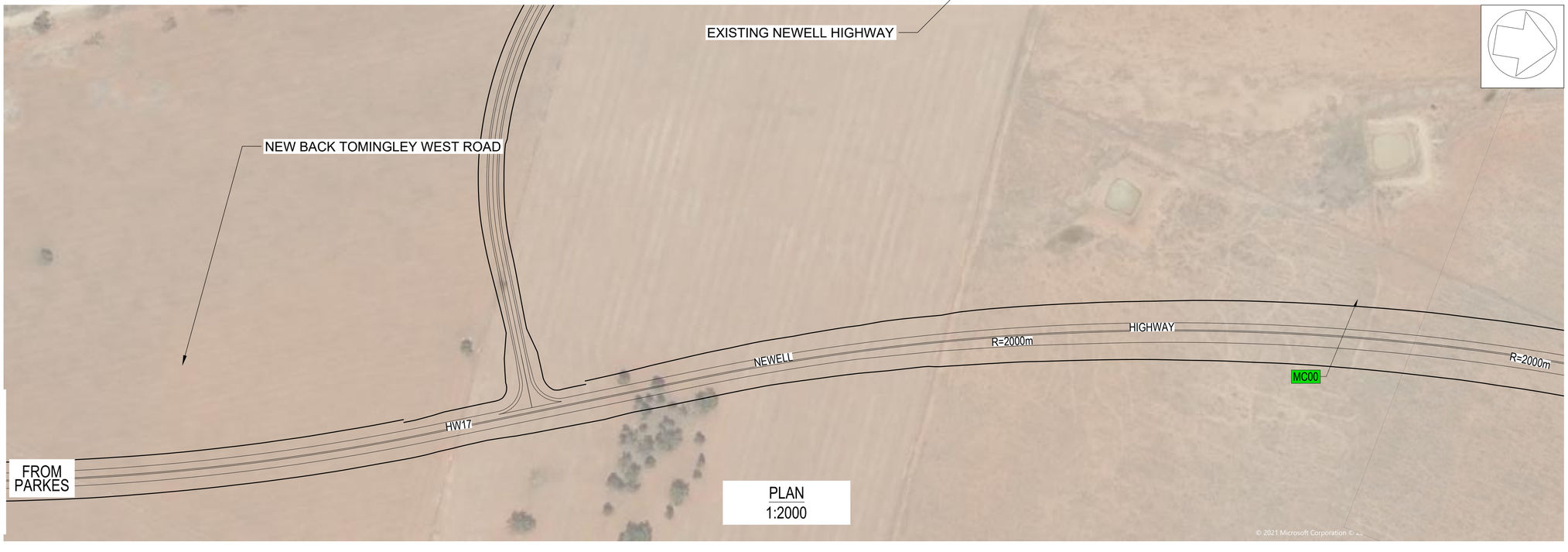
PLAN
1:2000

LEGEND

CONTROL LINE

DESIGN VERGE

DESIGN BATTER



PLAN
1:2000

0 60 120 Meters

REV	DATE	REVISION DETAILS	APPROVED
1	15-07-21	50% CONCEPT DESIGN CLOSE-OUT	SOR
0	14-05-21	50% CONCEPT DESIGN FOR CLIENT & TfNSW REVIEW	SOR
D	12-05-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM

DESIGNED: L.BAYNHAM

CHECKED: S.O'ROURKE

APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

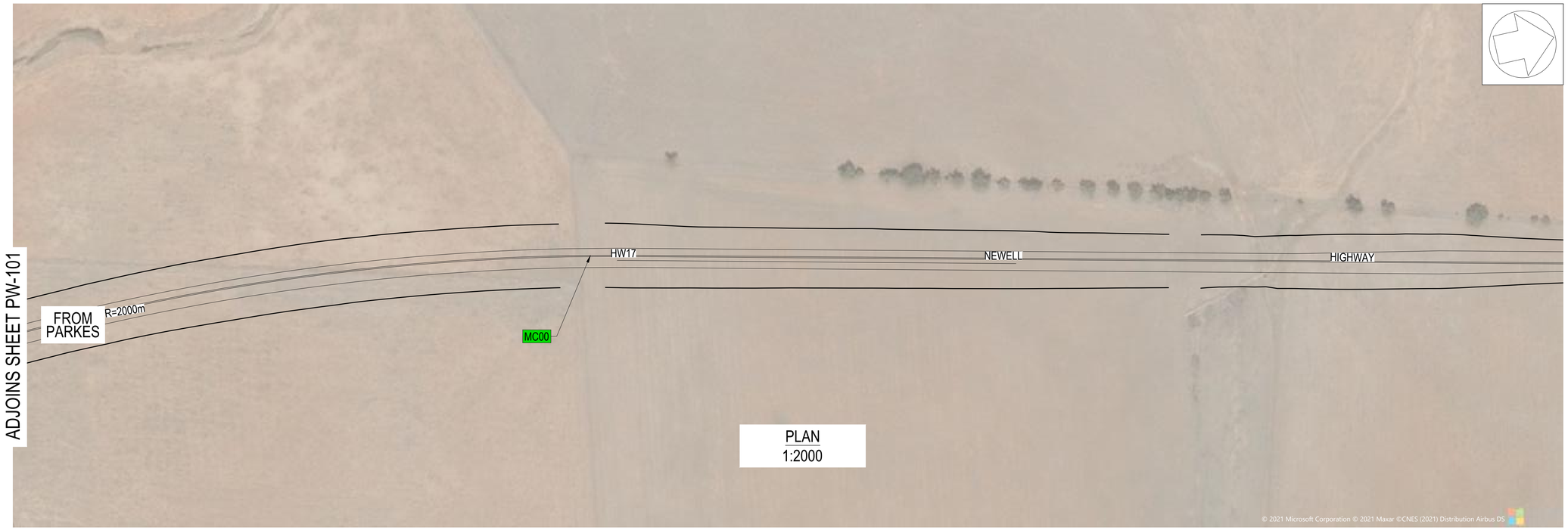
DRAWING TITLE: PROPERTY PLAN - SHEET 1 OF 4

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

constructive solutions
providing total solutions

50% CONCEPT DESIGN

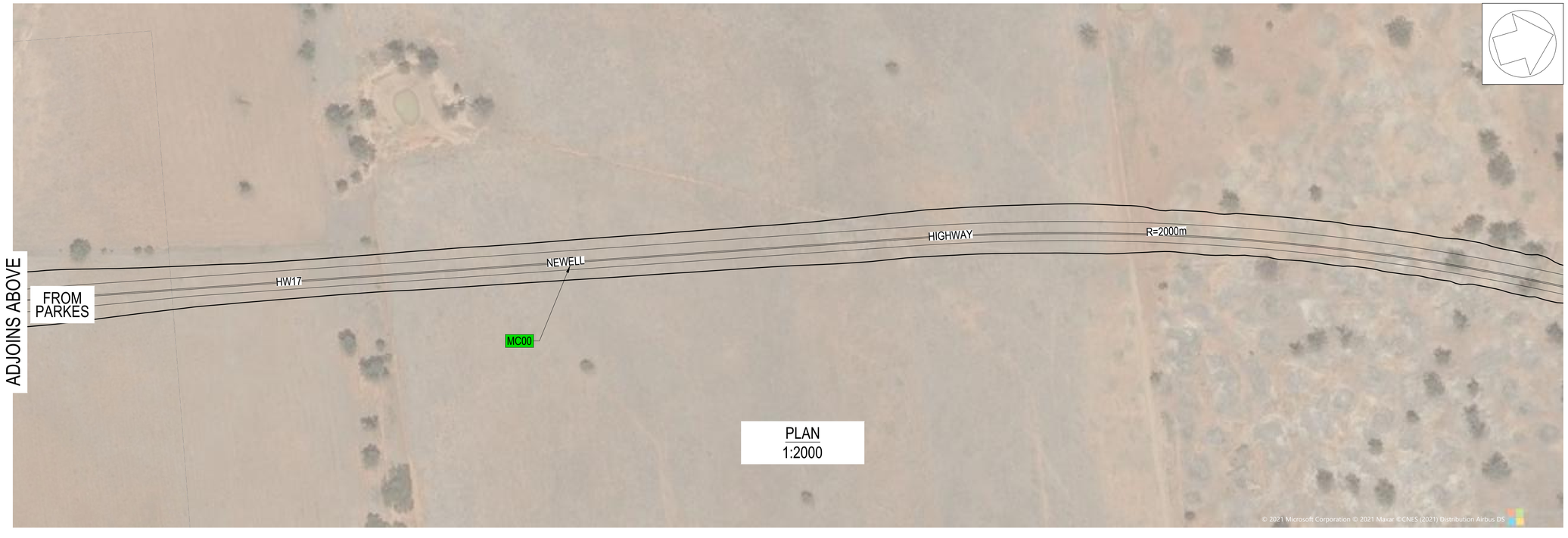
TfNWS REGISTRATION No.	SIZE
TBC	A1
DRAWING NUMBER	REV
PW-101	1



PLAN
1:2000

LEGEND

- CONTROL LINE
- DESIGN VERGE
- DESIGN BATTER



PLAN
1:2000

0 60 120 Meters

REV	DATE	REVISION DETAILS	APPROVED
1	15-07-21	50% CONCEPT DESIGN CLOSE-OUT	SOR
0	14-05-21	50% CONCEPT DESIGN FOR CLIENT & TfNSW REVIEW	SOR
D	12-05-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN L.BAYNHAM

DESIGNED L.BAYNHAM

CHECKED S.O'ROURKE

APPROVED S.O'ROURKE

PROJECT

NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

DRAWING TITLE

PROPERTY PLAN - SHEET 2 OF 4

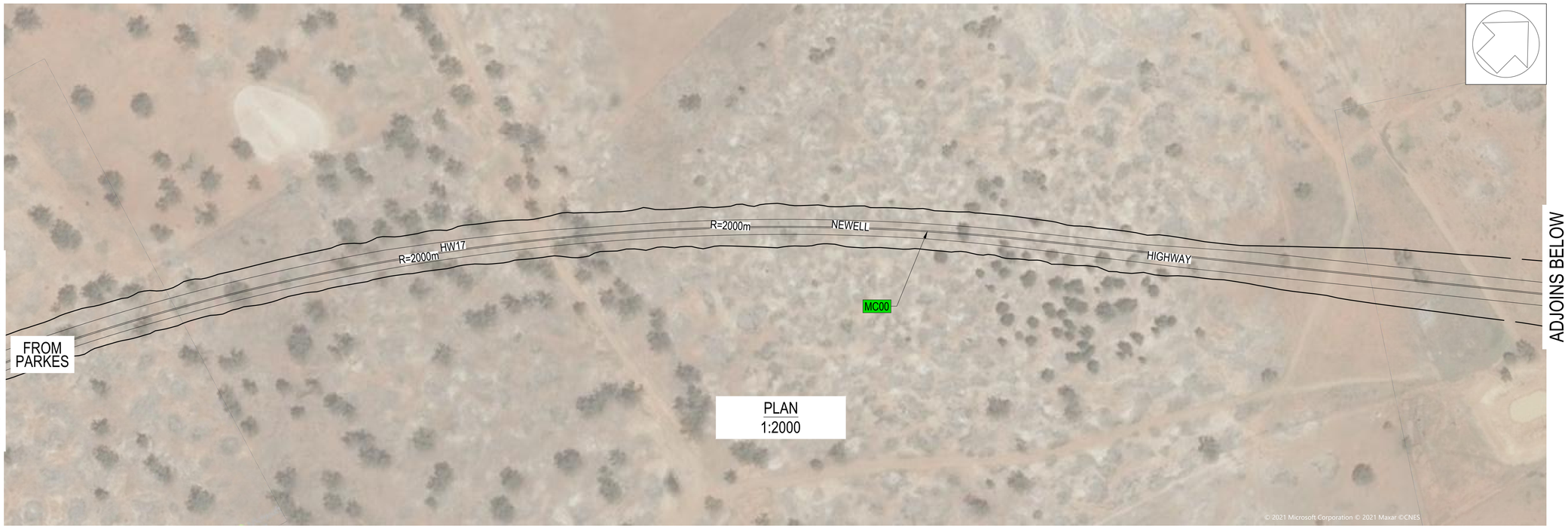
CLIENT

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

constructive solutions
providing total solutions

50% CONCEPT DESIGN

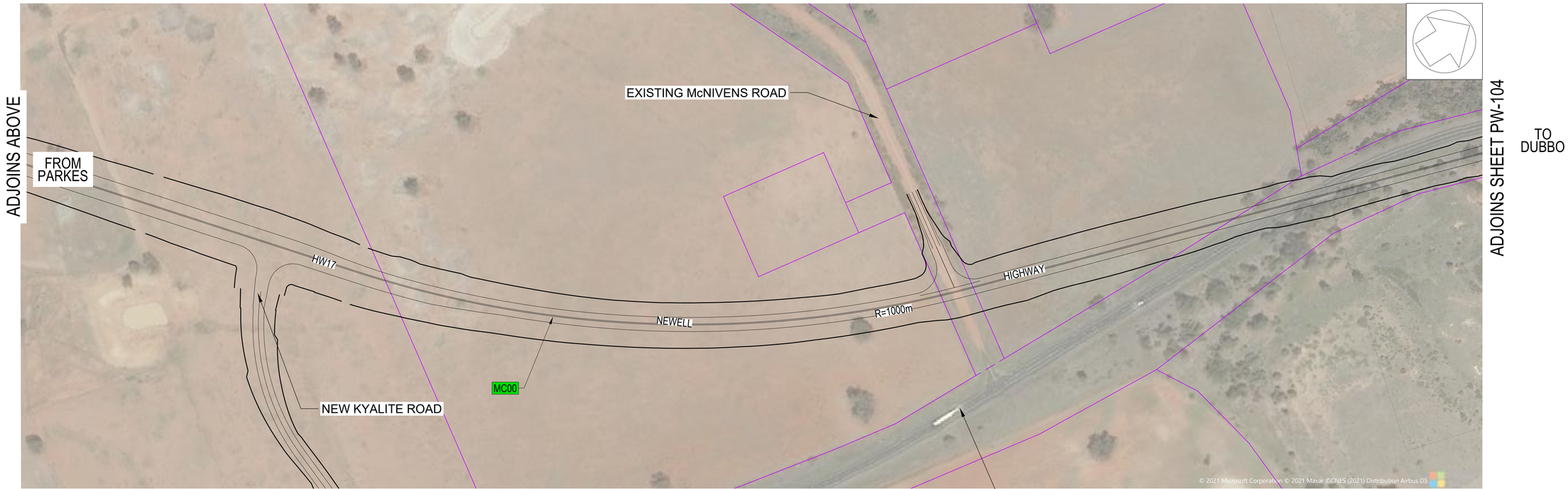
TfNWS REGISTRATION No.	SIZE
TBC	A1
DRAWING NUMBER	**REV**
PW-102	1



PLAN
1:2000

LEGEND

- CONTROL LINE
- DESIGN VERGE
- DESIGN BATTER



PLAN
1:2000

0 60 120 Meters

REV	DATE	REVISION DETAILS	APPROVED
1	15-07-21	50% CONCEPT DESIGN CLOSE-OUT	SOR
0	14-05-21	50% CONCEPT DESIGN FOR CLIENT & TfNSW REVIEW	SOR
D	12-05-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN	DESIGNED	CHECKED	APPROVED
L.BAYNHAM	L.BAYNHAM	S.O'ROURKE	S.O'ROURKE

PROJECT
NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

DRAWING TITLE
PROPERTY PLAN - SHEET 3 OF 4

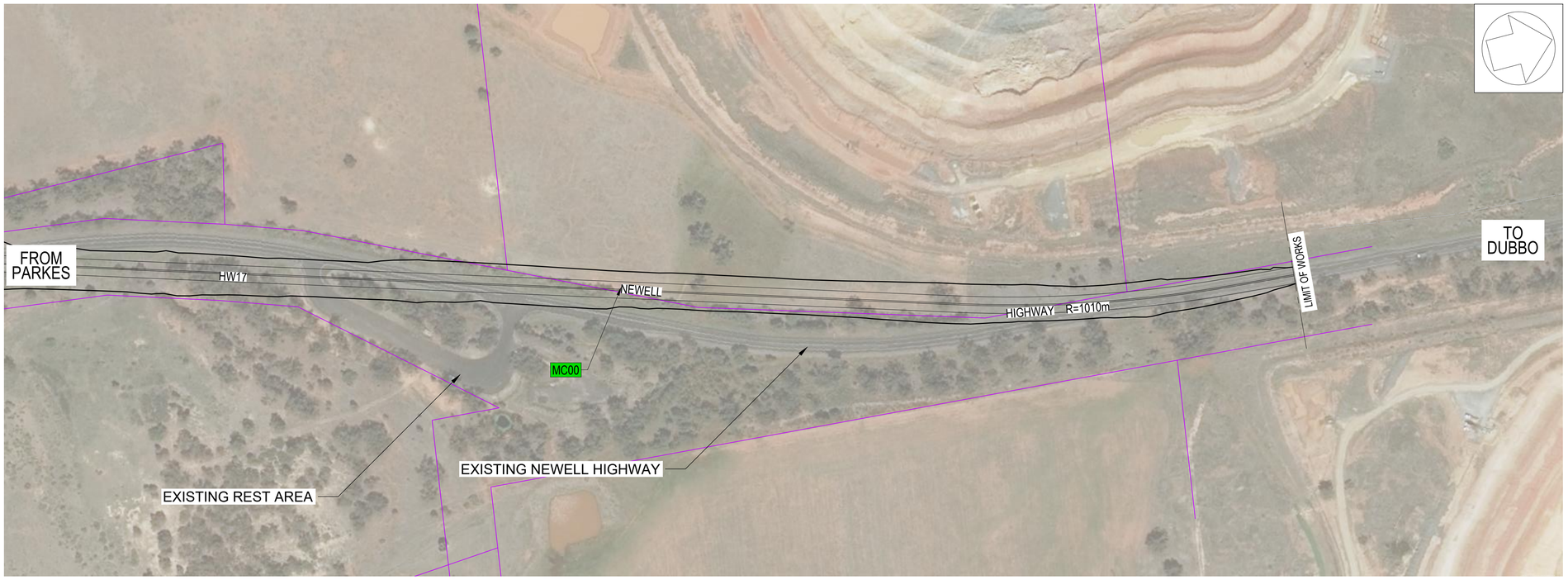
CLIENT
TOMINGLEY GOLD OPERATIONS PTY LTD
(A wholly owned subsidiary of Alkane Resources Ltd)

constructive solutions
providing total solutions

50% CONCEPT DESIGN

TfNWS REGISTRATION No.	SIZE
TBC	A1
DRAWING NUMBER	**REV**
PW-103	1

ADJOINS SHEET PW-103



LEGEND

CONTROL LINE

DESIGN VERGE

DESIGN BATTER

PLAN
1:2000

0 60 120 Meters

REV	DATE	REVISION DETAILS	APPROVED
1	15-07-21	50% CONCEPT DESIGN CLOSE-OUT	SOR
0	14-05-21	50% CONCEPT DESIGN FOR CLIENT & TfNSW REVIEW	SOR
D	12-05-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN	L.BAYNHAM
DESIGNED	L.BAYNHAM
CHECKED	S.O'ROURKE
APPROVED	S.O'ROURKE

PROJECT

NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

DRAWING TITLE

PROPERTY PLAN - SHEET 4 OF 4

CLIENT

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

constructive solutions
providing total solutions

50% CONCEPT DESIGN

TfNWS REGISTRATION No.	SIZE
TBC	A1
DRAWING NUMBER	REV
PW-104	1

Appendix 4: Kyalite Road Realignment – 100% Concept Design (Extract)

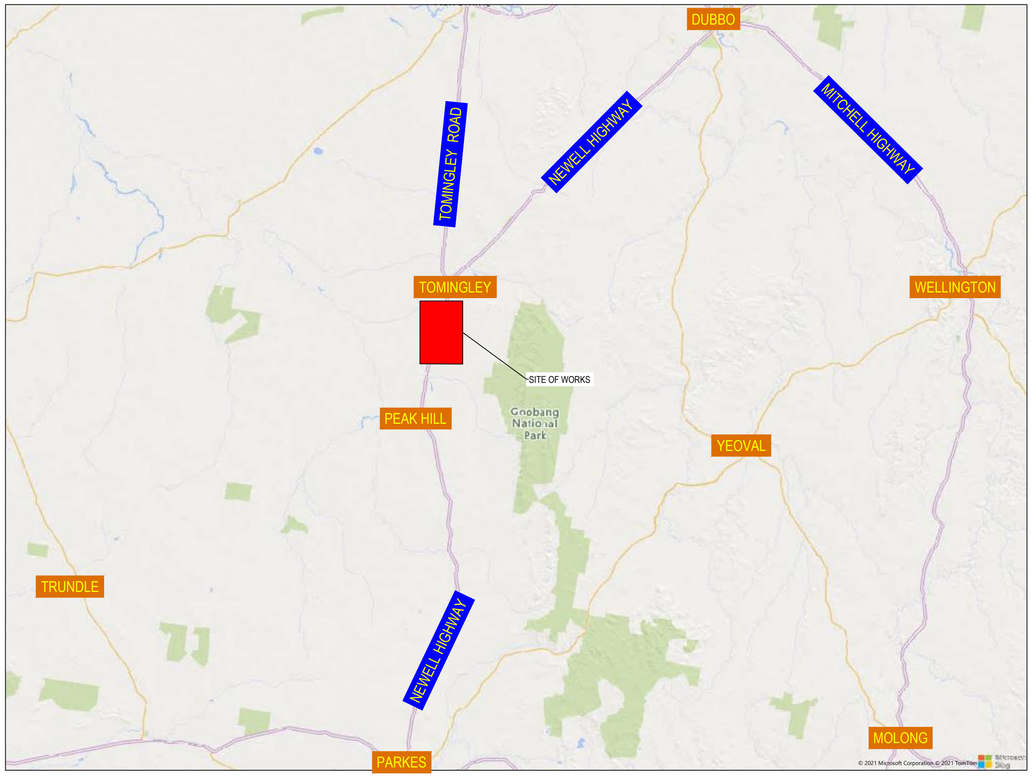
HW17 NEWELL HIGHWAY

NEWELL HIGHWAY PROPOSED DEVIATION

COUNCIL ROAD REALIGNMENTS

56.3KM TO 64.1KM NORTH OF PARKES

CONCEPT DESIGN DRAWINGS



LOCALITY PLAN

ROAD SHEETS		
ROAD	ALIGNMENT	SHEET SET
BACK TOMINGLEY WEST ROAD	MC10	1000
KYALITE ROAD	MC20	2000
McNIVENS ROAD	MC30	3000

SIGNATURE BOXES TO BE DETERMINED

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION 56.3km TO 64.1km NORTH OF PARKES

DRAWING TITLE: COVER SHEET

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

constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-0001	F

SHEET INDEX

Sheet Number	Sheet Name
2019116-0001	COVER SHEET
2019116-0002	SHEET INDEX
2019116-0003	COUNCIL ROADS PLAN OVERVIEW
BACK TOMINGLEY WEST ROAD (MC10) - 1000	
2019116-1001	PLAN OVERVIEW AND ALIGNMENT TABLE (MC10)
2019116-1010	TYPICAL SECTIONS & PAVEMENT DETAILS (MC10)
2019116-1011	TYPICAL SECTIONS & PAVEMENT DETAILS (MC11)
2019116-1101	PLAN VIEW AND LONGITUDINAL SECTION - SHEET 1 OF 2 (MC10)
2019116-1102	PLAN VIEW AND LONGITUDINAL SECTION - SHEET 2 OF 2 (MC10)
2019116-1103	PLAN VIEW AND LONGITUDINAL SECTION (MC11)
2019116-1201	CROSS SECTION VIEW - SHEET 1 OF 5 (MC10)
2019116-1202	CROSS SECTION VIEW - SHEET 2 OF 5 (MC10)
2019116-1203	CROSS SECTION VIEW - SHEET 3 OF 5 (MC10)
2019116-1204	CROSS SECTION VIEW - SHEET 4 OF 5 (MC10)
2019116-1205	CROSS SECTION VIEW - SHEET 5 OF 5 (MC11)
2019116-1500	BACK TOMINGLEY WEST ROAD - INTERSECTION DETAIL (MC10)
KYALITE ROAD (MC20) - 2000	
2019116-2001	PLAN OVERVIEW AND ALIGNMENT TABLE (MC20)
2019116-2010	TYPICAL SECTIONS & PAVEMENT DETAILS (MC20)
2019116-2101	PLAN VIEW AND LONGITUDINAL SECTION - SHEET 1 OF 7 (MC20)
2019116-2102	PLAN VIEW AND LONGITUDINAL SECTION - SHEET 2 OF 7 (MC20)
2019116-2103	PLAN VIEW AND LONGITUDINAL SECTION - SHEET 3 OF 7 (MC20)
2019116-2104	PLAN VIEW AND LONGITUDINAL SECTION - SHEET 4 OF 7 (MC20)
2019116-2105	PLAN VIEW AND LONGITUDINAL SECTION - SHEET 5 OF 7 (MC20)
2019116-2106	PLAN VIEW AND LONGITUDINAL SECTION - SHEET 6 OF 7 (MC20)
2019116-2107	PLAN VIEW AND LONGITUDINAL SECTION - SHEET 7 OF 7 (MC20)
2019116-2201	CROSS SECTION VIEW - SHEET 1 OF 42 (MC20)
2019116-2202	CROSS SECTION VIEW - SHEET 2 OF 42 (MC20)
2019116-2203	CROSS SECTION VIEW - SHEET 3 OF 42 (MC20)
2019116-2204	CROSS SECTION VIEW - SHEET 4 OF 42 (MC20)
2019116-2205	CROSS SECTION VIEW - SHEET 5 OF 42 (MC20)
2019116-2206	CROSS SECTION VIEW - SHEET 6 OF 42 (MC20)
2019116-2207	CROSS SECTION VIEW - SHEET 7 OF 42 (MC20)
2019116-2208	CROSS SECTION VIEW - SHEET 8 OF 42 (MC20)
2019116-2209	CROSS SECTION VIEW - SHEET 9 OF 42 (MC20)
2019116-2210	CROSS SECTION VIEW - SHEET 10 OF 42 (MC20)
2019116-2211	CROSS SECTION VIEW - SHEET 11 OF 42 (MC20)
2019116-2212	CROSS SECTION VIEW - SHEET 12 OF 42 (MC20)
2019116-2213	CROSS SECTION VIEW - SHEET 13 OF 42 (MC20)
2019116-2214	CROSS SECTION VIEW - SHEET 14 OF 42 (MC20)
2019116-2215	CROSS SECTION VIEW - SHEET 15 OF 42 (MC20)
2019116-2216	CROSS SECTION VIEW - SHEET 16 OF 42 (MC20)
2019116-2217	CROSS SECTION VIEW - SHEET 17 OF 42 (MC20)
2019116-2218	CROSS SECTION VIEW - SHEET 18 OF 42 (MC20)
2019116-2219	CROSS SECTION VIEW - SHEET 19 OF 42 (MC20)
2019116-2220	CROSS SECTION VIEW - SHEET 20 OF 42 (MC20)
2019116-2221	CROSS SECTION VIEW - SHEET 21 OF 42 (MC20)
2019116-2222	CROSS SECTION VIEW - SHEET 22 OF 42 (MC20)
2019116-2223	CROSS SECTION VIEW - SHEET 23 OF 42 (MC20)
2019116-2224	CROSS SECTION VIEW - SHEET 24 OF 42 (MC20)
2019116-2225	CROSS SECTION VIEW - SHEET 25 OF 42 (MC20)
2019116-2226	CROSS SECTION VIEW - SHEET 26 OF 42 (MC20)
2019116-2227	CROSS SECTION VIEW - SHEET 27 OF 42 (MC20)
2019116-2228	CROSS SECTION VIEW - SHEET 28 OF 42 (MC20)
2019116-2229	CROSS SECTION VIEW - SHEET 29 OF 42 (MC20)
2019116-2230	CROSS SECTION VIEW - SHEET 30 OF 42 (MC20)
2019116-2231	CROSS SECTION VIEW - SHEET 31 OF 42 (MC20)
2019116-2232	CROSS SECTION VIEW - SHEET 32 OF 42 (MC20)
2019116-2233	CROSS SECTION VIEW - SHEET 33 OF 42 (MC20)
2019116-2234	CROSS SECTION VIEW - SHEET 34 OF 42 (MC20)
2019116-2235	CROSS SECTION VIEW - SHEET 35 OF 42 (MC20)
2019116-2236	CROSS SECTION VIEW - SHEET 36 OF 42 (MC20)
2019116-2237	CROSS SECTION VIEW - SHEET 37 OF 42 (MC20)
2019116-2238	CROSS SECTION VIEW - SHEET 38 OF 42 (MC20)
2019116-2239	CROSS SECTION VIEW - SHEET 39 OF 42 (MC20)
2019116-2240	CROSS SECTION VIEW - SHEET 40 OF 42 (MC20)
2019116-2241	CROSS SECTION VIEW - SHEET 41 OF 42 (MC20)
2019116-2242	CROSS SECTION VIEW - SHEET 42 OF 42 (MC20)
2019116-2700	PROPOSED KYALITE ROAD OVERPASS (MC20)
McNIVENS ROAD (MC30) - 3000	
2019116-3001	PLAN OVERVIEW AND ALIGNMENT TABLE (MC30)
2019116-3010	TYPICAL SECTIONS & PAVEMENT DETAILS (MC30)
2019116-3101	PLAN VIEW AND LONGITUDINAL SECTION (MC30)
2019116-3201	CROSS SECTION VIEW (MC30)

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

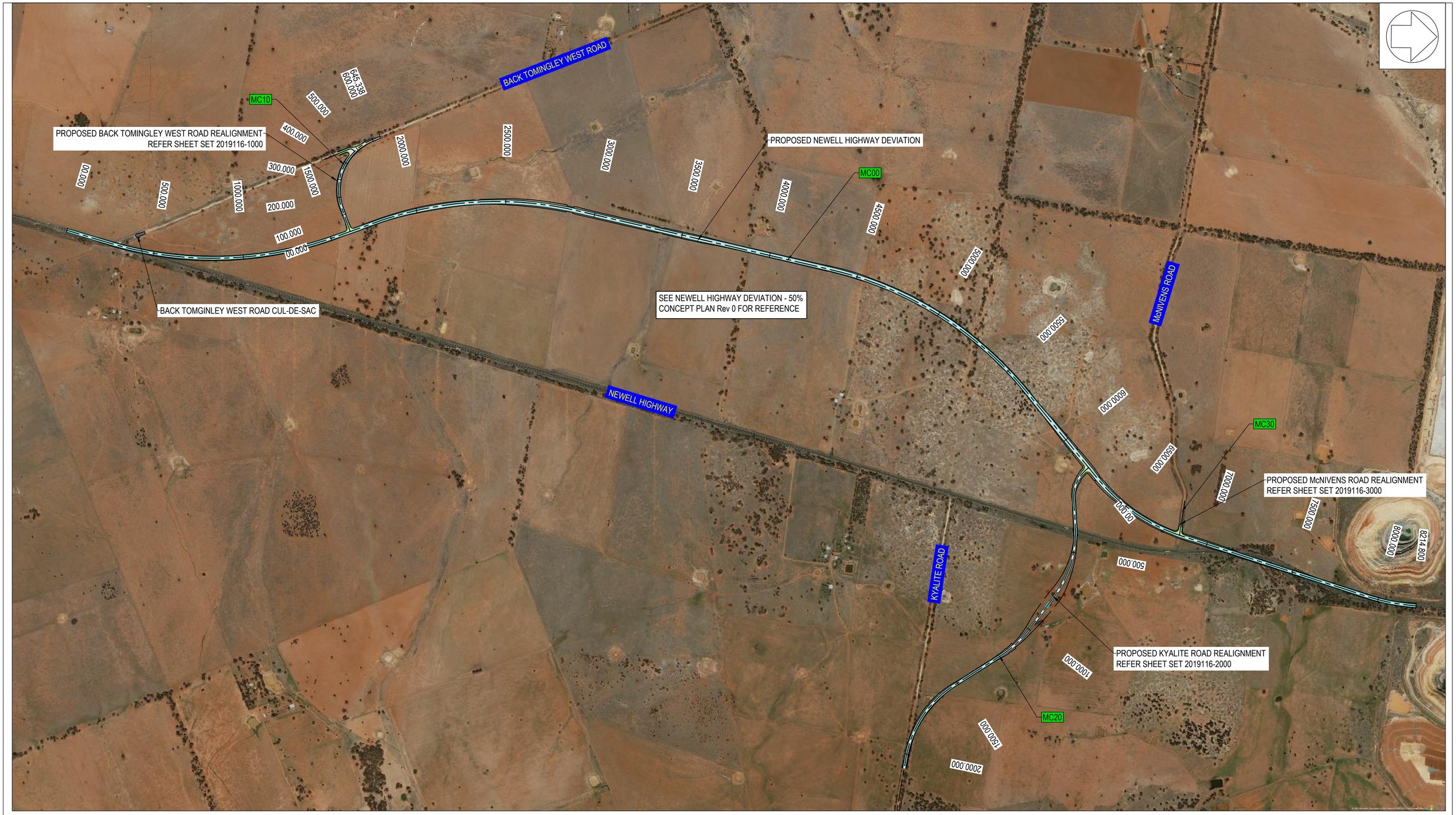
DRAWING TITLE: SHEET INDEX

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

constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-0002	F



PLAN OVERVIEW
1:10,000

0 300 600
Meters

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN	L.BAYNHAM
DESIGNED	L.BAYNHAM
CHECKED	S.O'ROURKE
APPROVED	S.O'ROURKE

PROJECT
NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

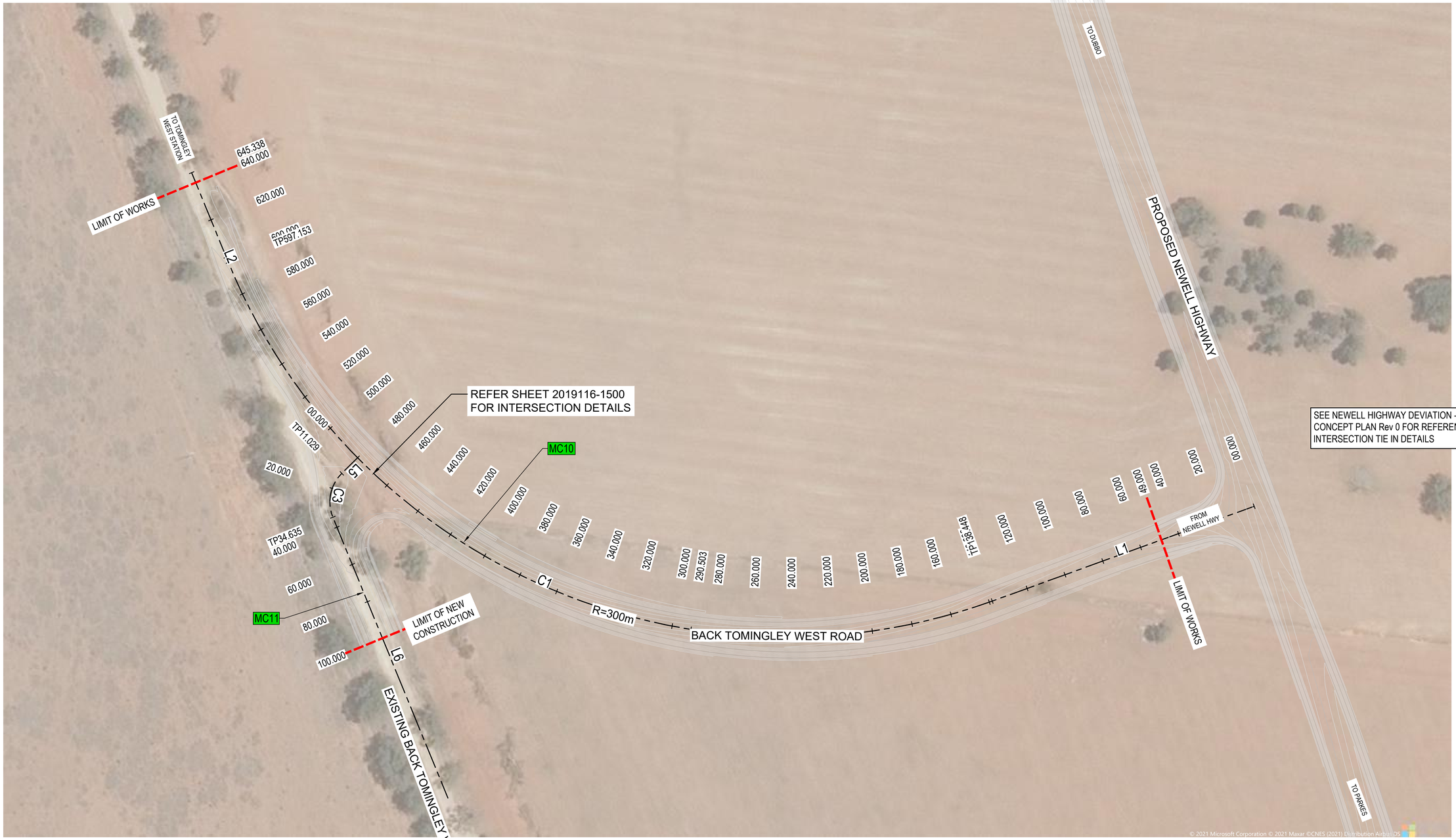
DRAWING TITLE
COUNCIL ROADS PLAN OVERVIEW

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

constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	**REV**
2019116-0003	F



PLAN OVERVIEW
1:1000

CUL-DE-SAC TO BE CONSTRUCTED AT THE END OF KYALITE AROUND, LOCATED AFTER THE LAST FARM ACCESS

0 30 60 Meters

ROAD SHEETS	
ROAD	ALIGNMENT
BACK TOMINGLEY WEST ROAD	MC10
KYALITE ROAD	MC20
McNIVENS ROAD	MC30

Set Out Table for MC-10

TAG		CHAINAGE	EASTING	NORTHING	LENGTH	RADIUS	BEARING
L1	BP	0.000	612508.948	6387713.952	138.448		250.1080
	EP	138.448	612378.761	6387666.845			
C1	TP	138.448	612378.761	6387666.845	458.704	300.0	293° 54' 39.82"
	IP	426.169	612108.207	6387568.949			
	TP	597.153	611999.095	6387835.177			
L2	BP	597.153	611999.095	6387835.177	48.185		337.7141
	EP	645.338	611980.822	6387879.763			

Set Out Table for MC-11

TAG		CHAINAGE	EASTING	NORTHING	LENGTH	RADIUS	BEARING
L5	BP	0.000	612063.301	6387738.075	11.029		225.3396
	EP	11.029	612055.456	6387730.322			
C3	TP	11.029	612055.456	6387730.322	23.606	20.0	191° 31' 36.63"
	IP	24.424	612045.928	6387720.907			
	TP	34.635	612051.008	6387708.512			
L6	BP	34.635	612051.008	6387708.512	150.830		157.7141
	EP	185.465	612108.207	6387568.949			

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	CONCEPT PLAN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

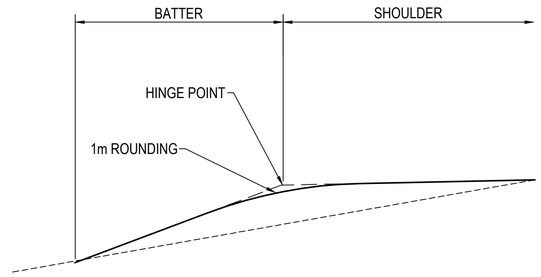
DRAWING TITLE: PLAN OVERVIEW AND ALIGNMENT TABLE (MC10)

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

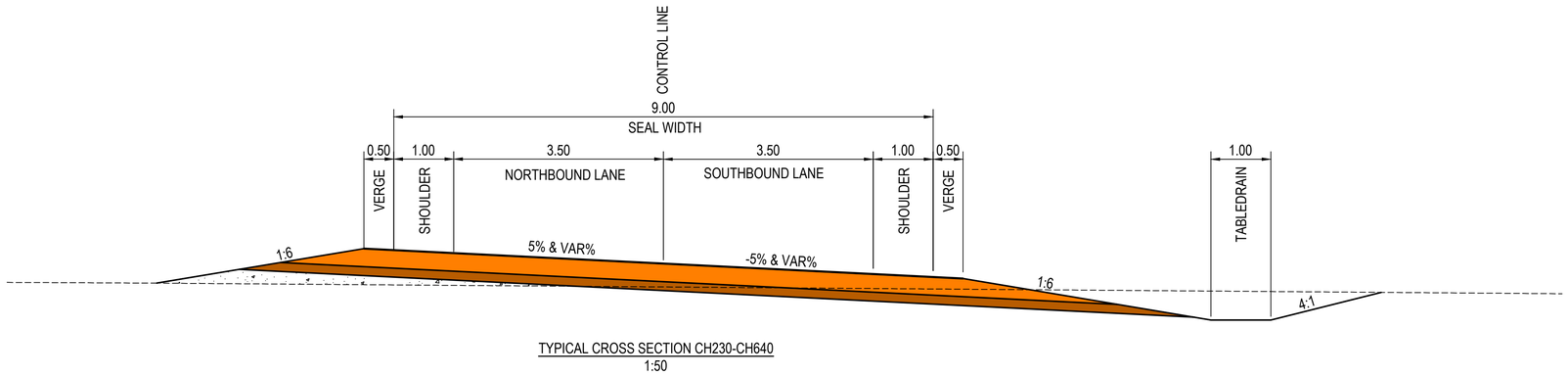
constructive solutions
providing total solutions

50% CONCEPT

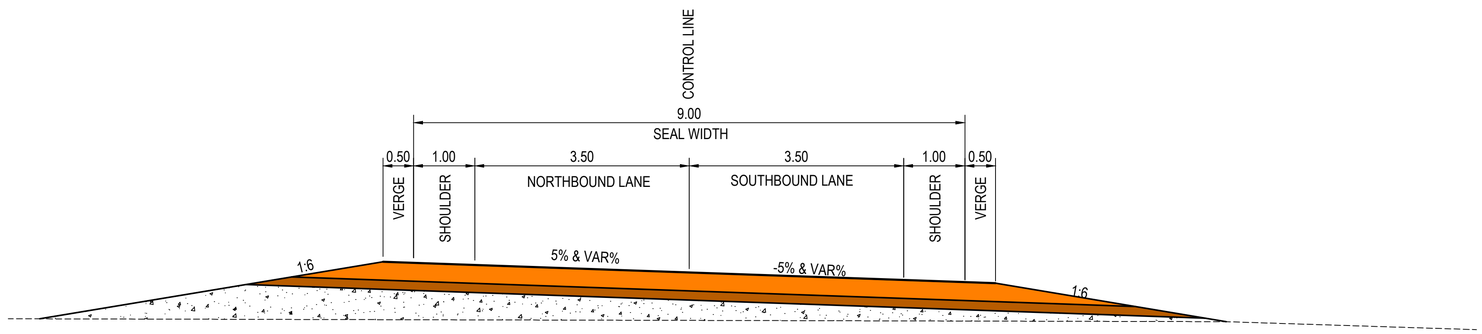
TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-1001	F



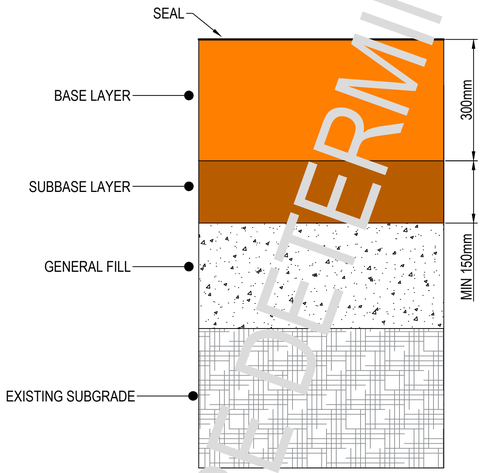
VERGE TO BATTER DETAIL
NTS



TYPICAL CROSS SECTION CH230-CH640
1:50



TYPICAL CROSS SECTION CH0-CH350
1:50



PAVEMENT DESIGN

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	CONCEPT PLAN FOR INTERNAL REVIEW	SOR

DRAWN	L.BAYNHAM
DESIGNED	L.BAYNHAM
CHECKED	S.O'ROURKE
APPROVED	S.O'ROURKE

PROJECT
NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

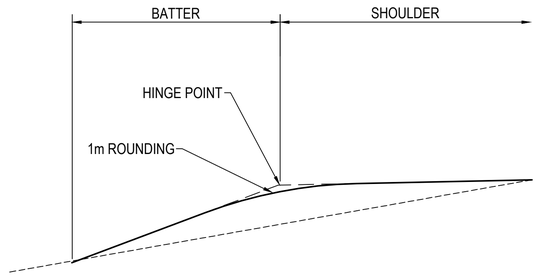
DRAWING TITLE
TYPICAL SECTIONS & PAVEMENT DETAILS (MC10)

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

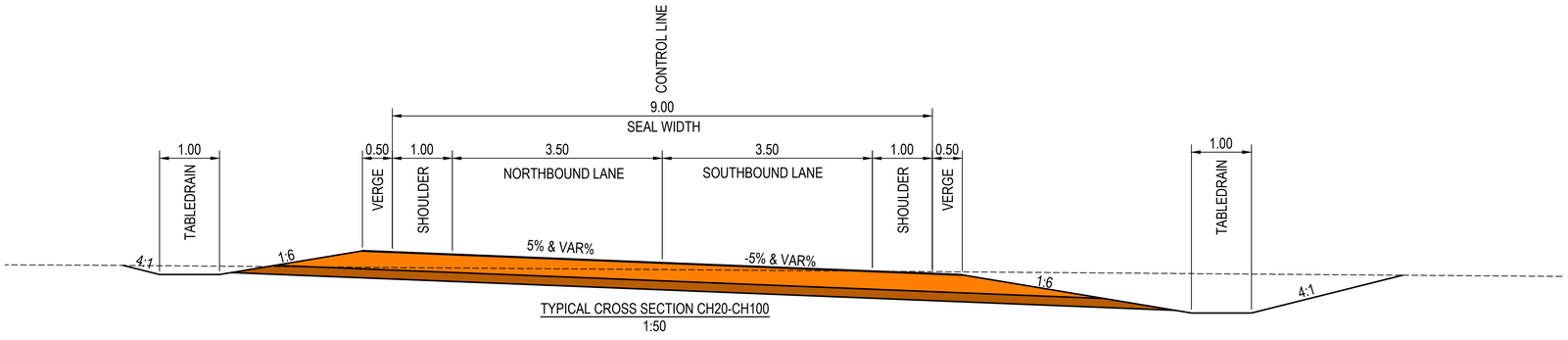
constructive solutions
providing total solutions

50% CONCEPT

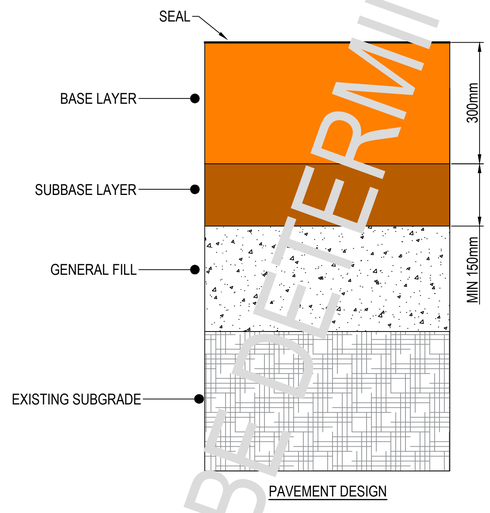
TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-1010	F



VERGE TO BATTER DETAIL
NTS



TYPICAL CROSS SECTION CH20-CH100
1:50



PAVEMENT DESIGN

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	CONCEPT PLAN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

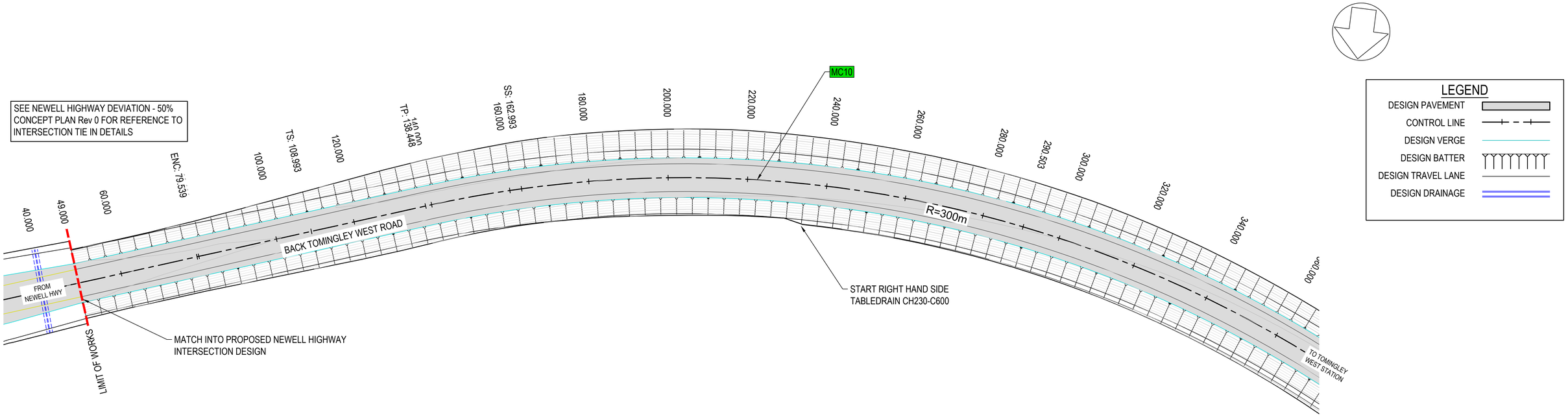
DRAWING TITLE: TYPICAL SECTIONS & PAVEMENT DETAILS (MC11)

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

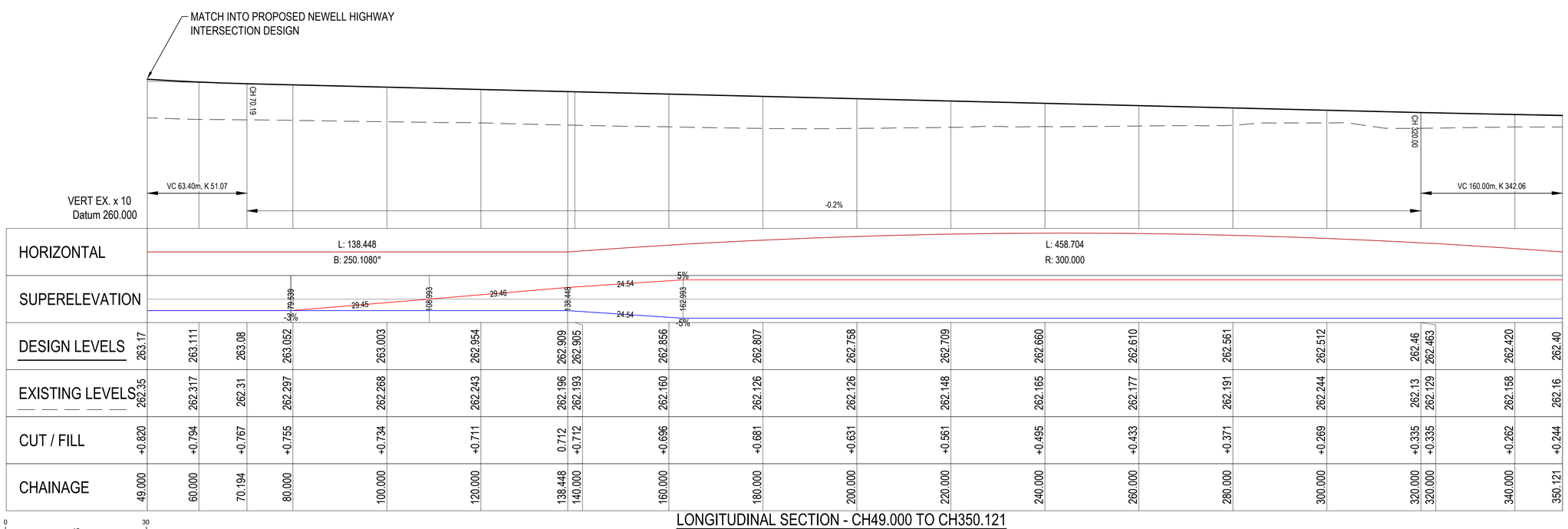
constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-2004	F



PLAN
1:500



LONGITUDINAL SECTION - CH49.000 TO CH350.121
1:500

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	CONCEPT PLAN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

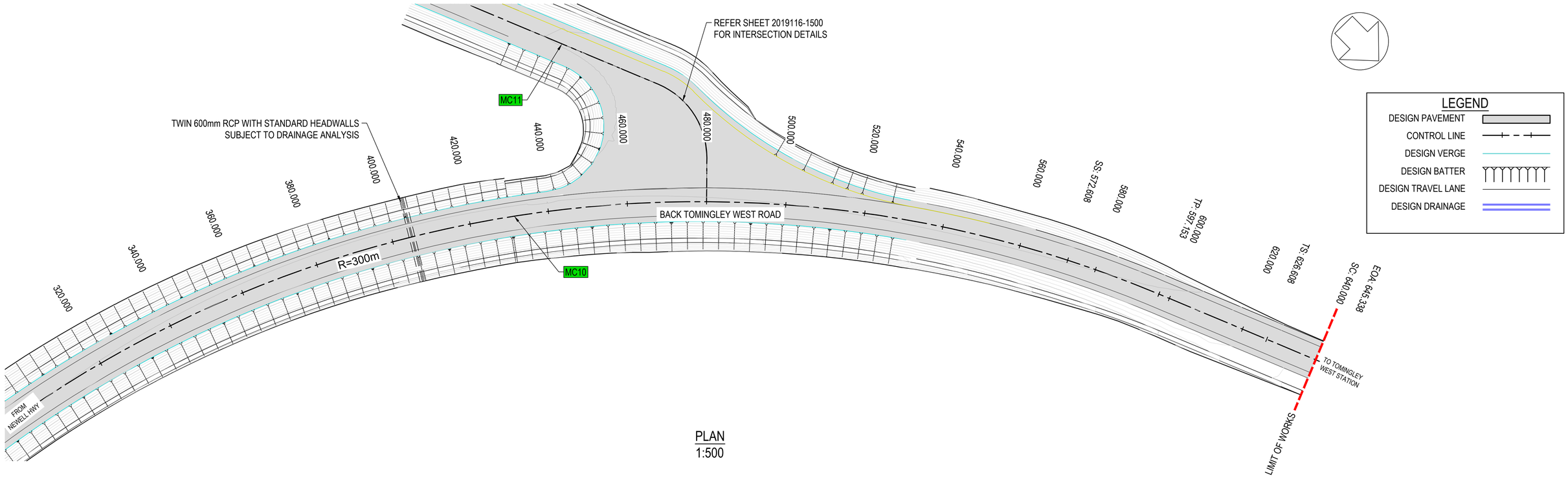
DRAWING TITLE: PLAN VIEW AND LONGITUDINAL SECTION - SHEET 1 OF 2 (MC10)

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

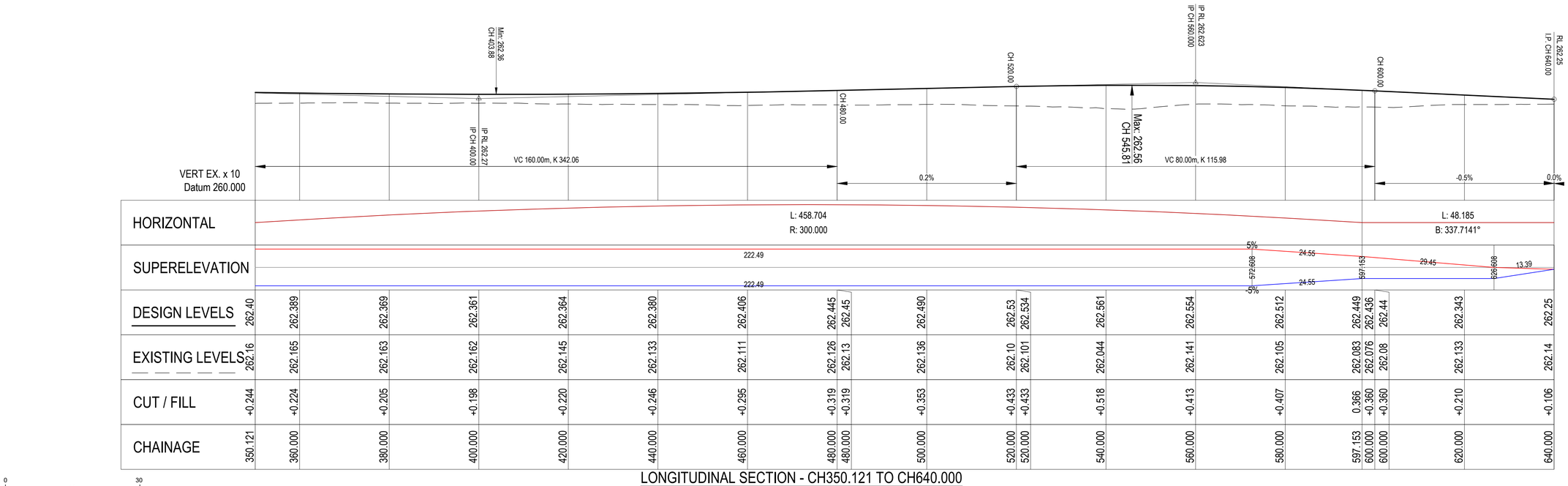
constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-1101	F



PLAN
1:500



LONGITUDINAL SECTION - CH350.121 TO CH640.000
1:500

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	CONCEPT PLAN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

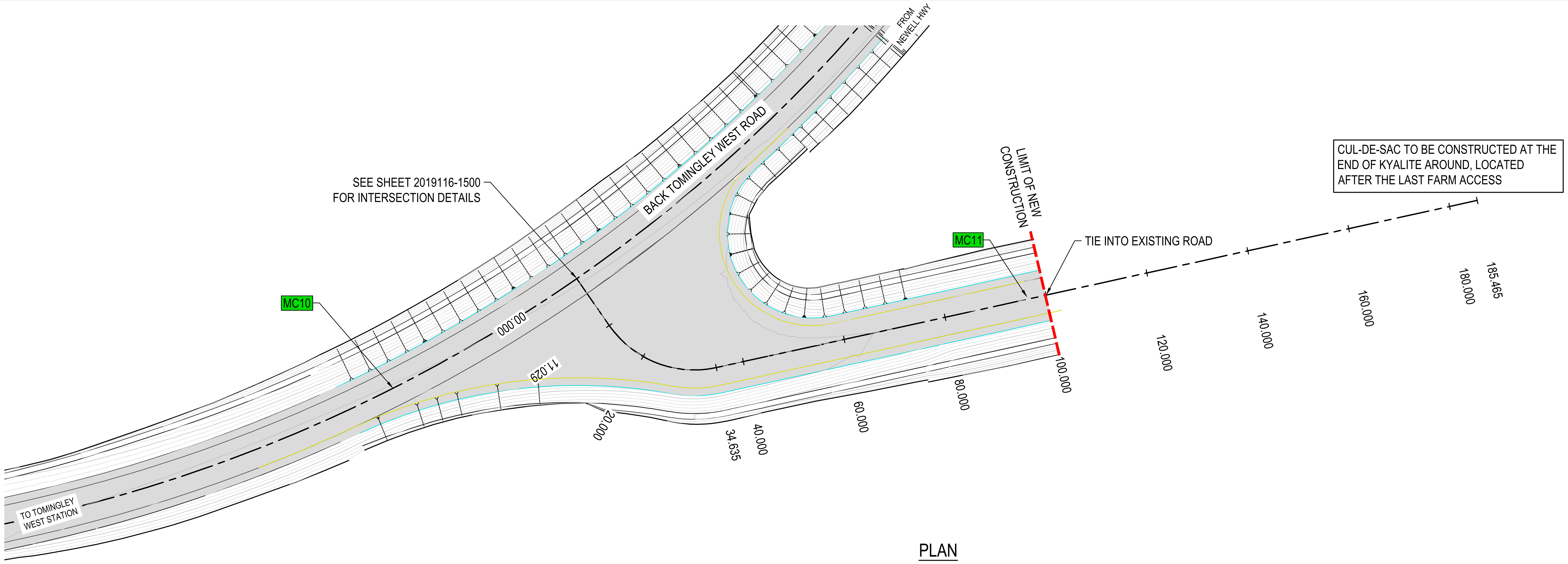
DRAWING TITLE: PLAN VIEW AND LONGITUDINAL SECTION - SHEET 2 OF 2 (MC10)

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

constructive solutions
providing total solutions

50% CONCEPT

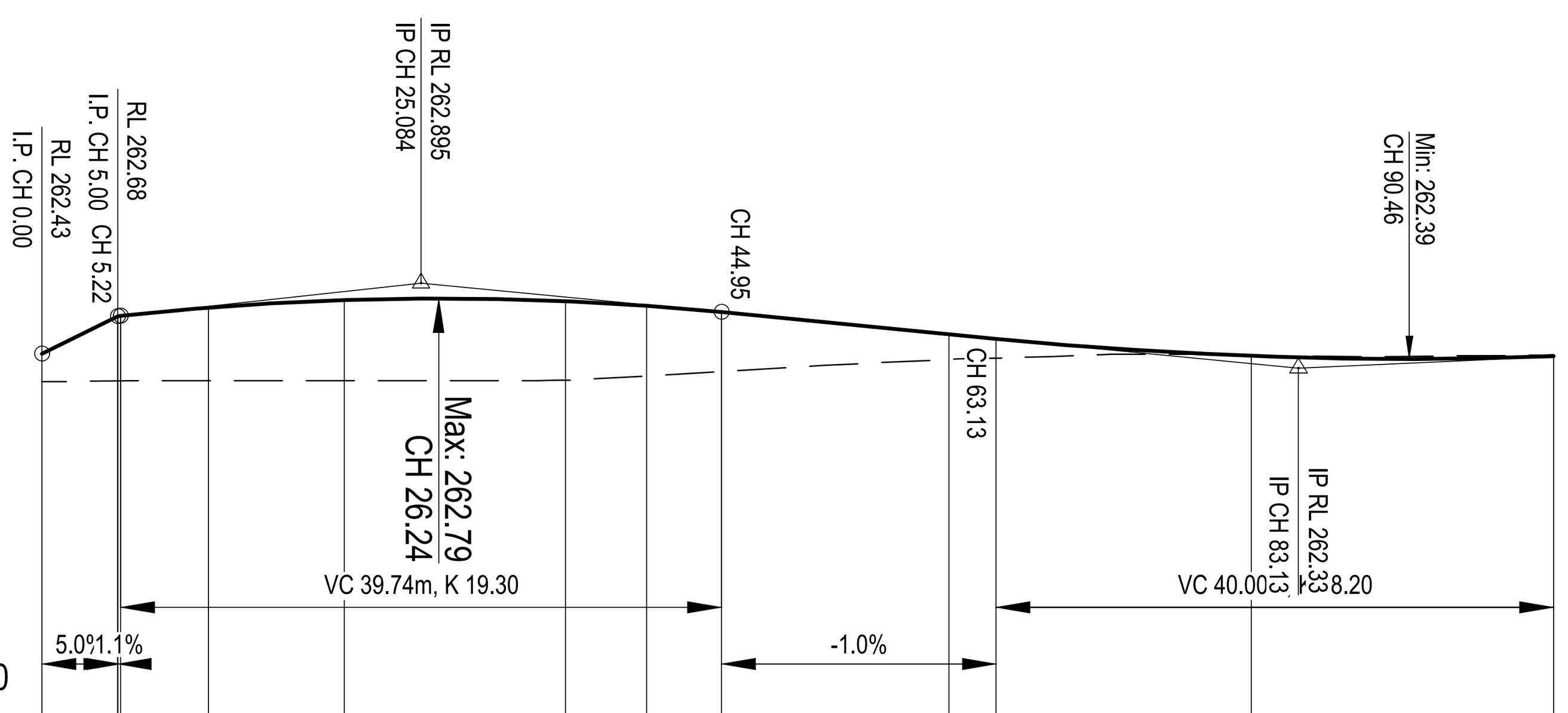
TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-1102	F



LEGEND

- DESIGN PAVEMENT
- CONTROL LINE
- DESIGN VERGE
- DESIGN BATTER
- DESIGN TRAVEL LANE
- DESIGN DRAINAGE

PLAN
1:500



HORIZONTAL	L: 11.029 B: 225.3396°		L: 23.606 R: 20.000		L: 150.830 B: 157.7141°						
SUPERELEVATION											
DESIGN LEVELS	262.43	262.68	262.733	262.783	262.774	262.744	262.70	262.556	262.53	262.413	262.41
EXISTING LEVELS	262.24	262.25	262.250	262.250	262.253	262.281	262.31	262.390	262.40	262.418	262.42
CUT / FILL	+0.183	+0.431	0.482	+0.533	0.522	+0.463	+0.392	+0.166	+0.128	-0.005	-0.010
CHAINAGE	0.000	5.217	11.029	20.000	34.635	40.000	44.952	60.000	63.126	80.000	100.000

LONGITUDINAL SECTION - CH0.000 TO CH100.000
1:500

0 15 30 Meters

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	CONCEPT PLAN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION 56.3km TO 64.1km NORTH OF PARKES

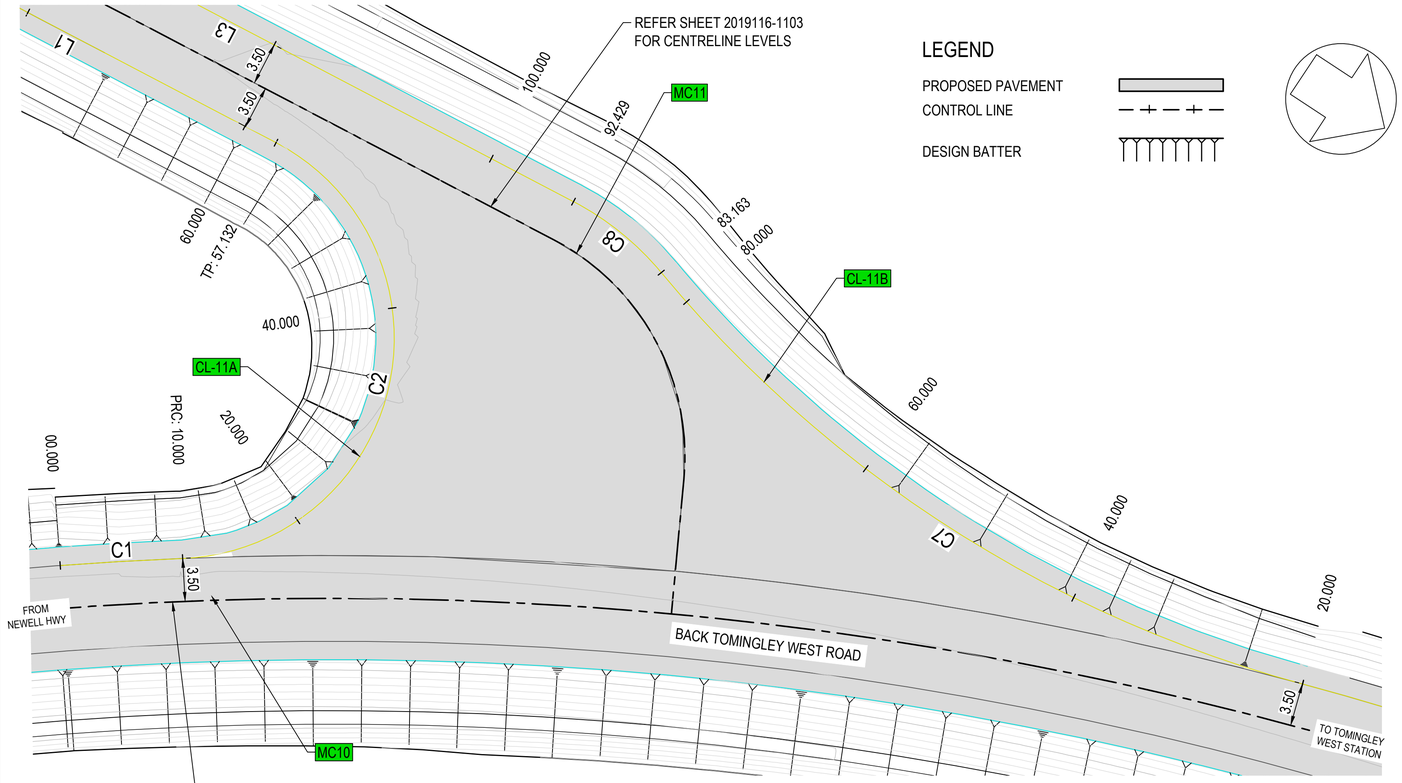
DRAWING TITLE: PLAN VIEW AND LONGITUDINAL SECTION (MC11)

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

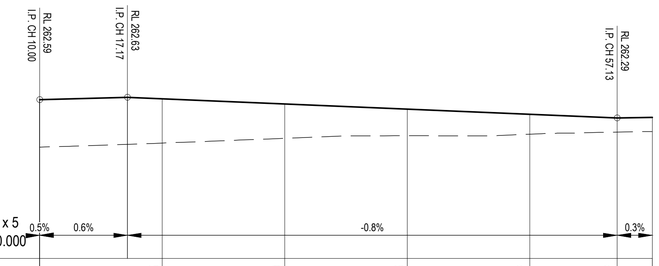
constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-1103	F



LAYOUT PLAN
1:250

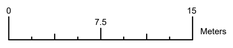


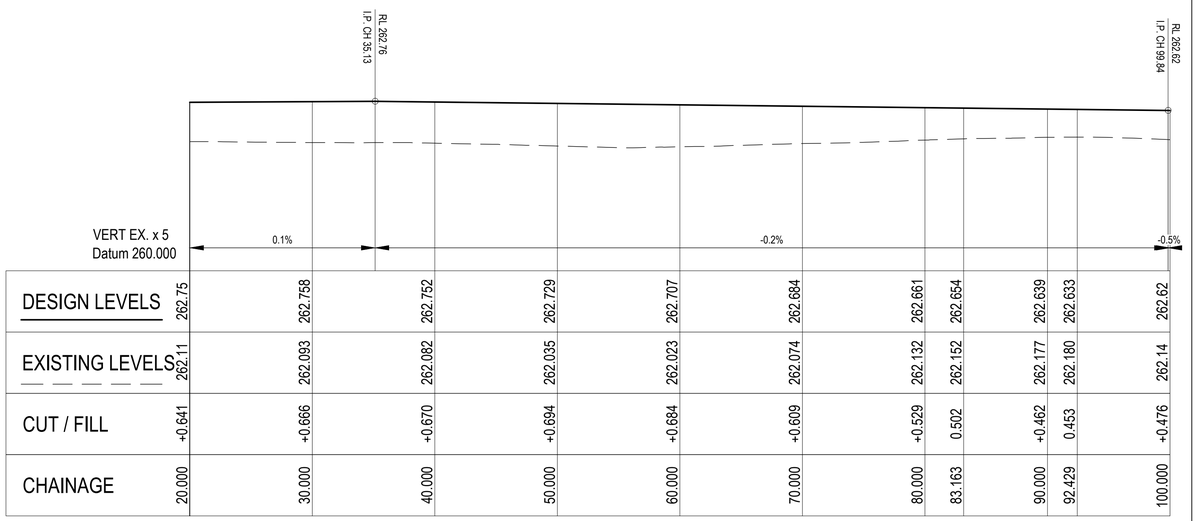
DESIGN LEVELS	262.59	262.605	262.520	262.436	262.352	262.292	262.30
EXISTING LEVELS	261.82	261.881	261.960	262.001	262.027	262.062	262.07
CUT / FILL	+0.773	+0.724	+0.561	+0.435	+0.325	0.230	+0.231
CHAINAGE	10.000	20.000	30.000	40.000	50.000	57.132	60.000

LONGITUDINAL SECTION - CL-11A
1:250

Set Out Table for CL-11A							
TAG		CHAINAGE	EASTING	NORTHING	LENGTH	RADIUS	BEARING
C1	TP	0.000	612098.927	6387702.950	10.000	303.5	306° 47' 46.18"
	IP	5.000	612094.874	6387705.878			
	TP	10.000	612090.920	6387708.939			
C2	TP	10.000	612090.920	6387708.939	47.132	18.0	232° 43' 37.54"
	IP	77.238	612037.748	6387750.094			
	TP	57.132	612063.247	6387687.879			
L1	BP	57.132	612063.247	6387687.879	37.980		157.7141
	EP	95.112	612077.650	6387652.736			

Set Out Table for CL-11B							
TAG		CHAINAGE	EASTING	NORTHING	LENGTH	RADIUS	BEARING
C6	TP	0.000	612016.687	6387792.379	20.000	303.5	147° 03' 23.85"
	IP	10.004	612021.848	6387783.810			
	TP	20.000	612027.562	6387775.598			
C7	TP	20.000	612027.562	6387775.598	63.163	103.0	162° 44' 10.92"
	IP	52.610	612046.187	6387748.831			
	TP	83.163	612046.014	6387716.221			
C8	TP	83.163	612046.014	6387716.221	9.265	23.5	169° 00' 32.49"
	IP	87.857	612045.989	6387711.528			
	TP	92.429	612047.769	6387707.185			
L3	BP	92.429	612047.769	6387707.185	67.778		157.7141
	EP	160.207	612073.473	6387644.469			





DESIGN LEVELS	262.75	262.758	262.752	262.729	262.707	262.684	262.661	262.654	262.639	262.633	262.62
EXISTING LEVELS	262.11	262.093	262.082	262.035	262.023	262.074	262.132	262.152	262.177	262.180	262.14
CUT / FILL	+0.641	+0.666	+0.670	+0.694	+0.684	+0.609	+0.529	0.502	+0.462	0.453	+0.476
CHAINAGE	20.000	30.000	40.000	50.000	60.000	70.000	80.000	83.163	90.000	92.429	100.000

LONGITUDINAL SECTION - CL-11B
1:250

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	CONCEPT PLAN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

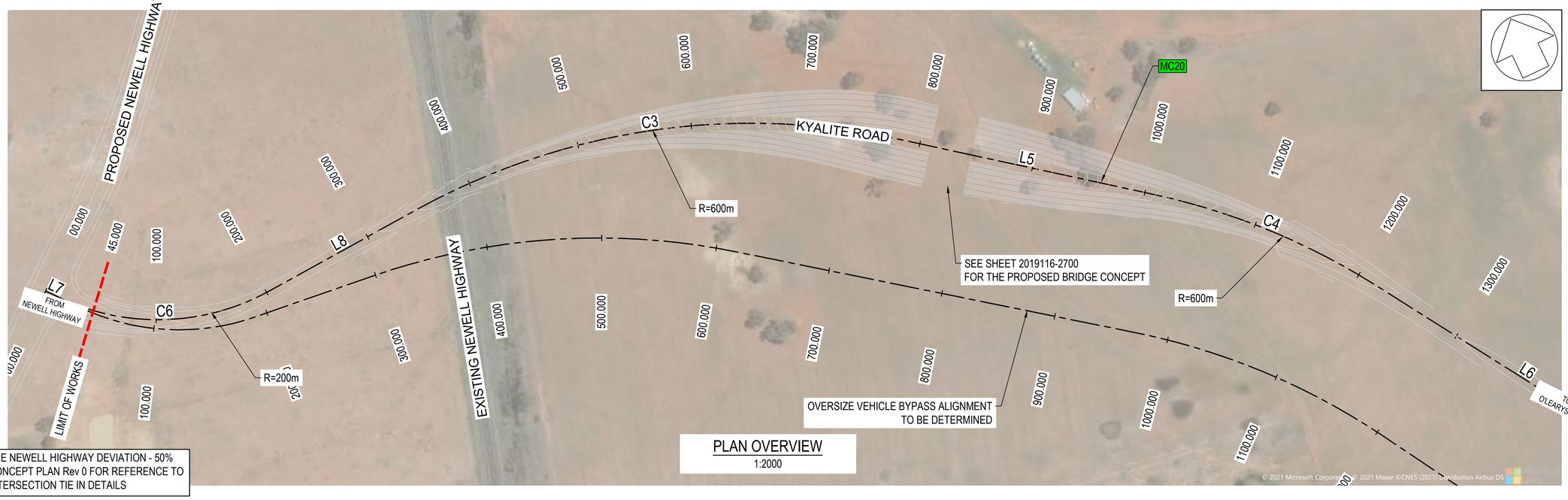
DRAWING TITLE: BACK TOMINGLEY WEST ROAD - INTERSECTION DETAIL

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

constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-1500	F



PLAN OVERVIEW
1:2000

SEE NEWELL HIGHWAY DEVIATION - 50% CONCEPT PLAN Rev 0 FOR REFERENCE TO INTERSECTION TIE IN DETAILS

PLAN OVERVIEW
1:2000

0 60 120 Meters

Set Out Table for MC-20							
TAG		CHAINAGE	EASTING	NORTHING	LENGTH	RADIUS	BEARING
L7	BP	0.000	613821.181	6391820.313	13.090		140.7087
	EP	13.090	613829.470	6391810.182			
C6	TP	13.090	613829.470	6391810.182	189.266	200.0	113° 35' 54.13"
	IP	115.481	613894.311	6391730.938			
	TP	202.356	613996.509	6391737.210			
L8	BP	202.356	613996.509	6391737.210	147.323		086.4880
	EP	349.679	614143.556	6391746.235			
C3	TP	349.679	614143.556	6391746.235	430.291	600.0	107° 01' 58.47"
	IP	574.546	614368.000	6391760.010			
	TP	779.971	614546.213	6391622.877			
L5	BP	779.971	614546.213	6391622.877	227.583		127.5778
	EP	1007.553	614726.578	6391484.089			
C4	TP	1007.553	614726.578	6391484.089	209.741	600.0	137° 35' 31.94"
	IP	1113.505	614810.548	6391419.475			
	TP	1217.295	614867.309	6391330.011			
L6	BP	1217.295	614867.309	6391330.011	302.605		147.6066
	EP	1519.900	615029.424	6391074.494			
C5	TP	1519.900	615029.424	6391074.494	500.799	600.0	123° 41' 42.74"
	IP	1785.926	615171.942	6390849.864			
	TP	2020.699	615434.099	6390804.658			

ROAD SHEETS	
ROAD	ALIGNMENT
BACK TOMINGLEY WEST ROAD	MC10
KYALITE ROAD	MC20
McNIVENS ROAD	MC30

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

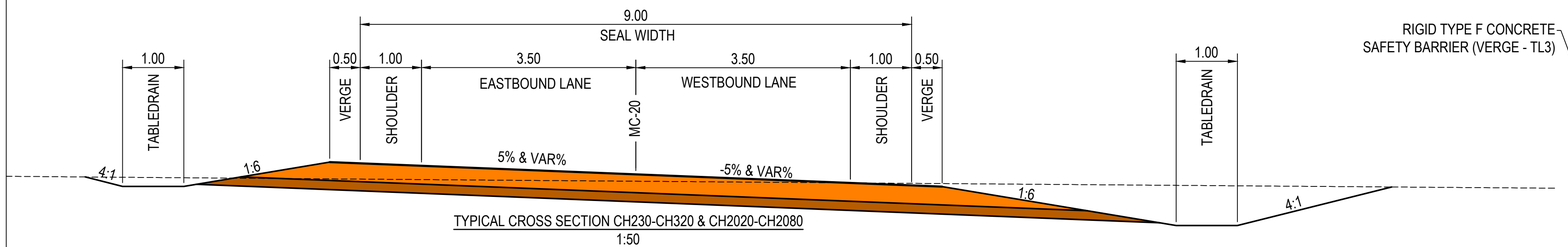
DRAWING TITLE: PLAN OVERVIEW AND ALIGNMENT TABLE (MC20)

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

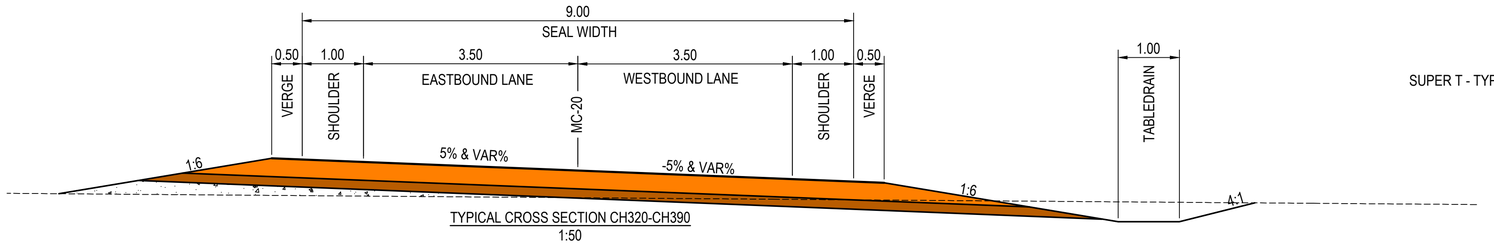
constructive solutions
providing total solutions

50% CONCEPT

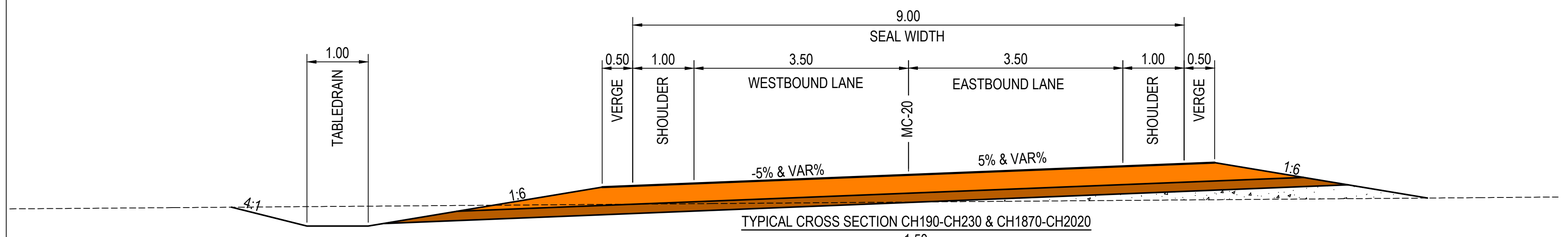
TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-2001	F



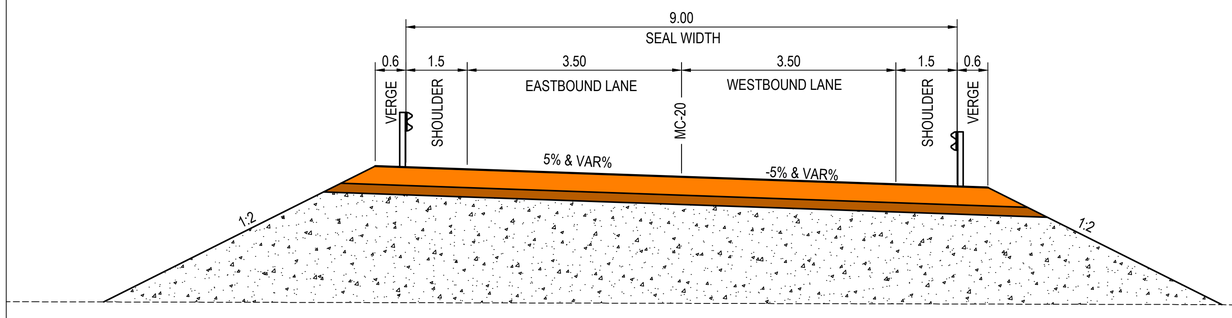
TYPICAL CROSS SECTION CH230-CH320 & CH2020-CH2080
1:50



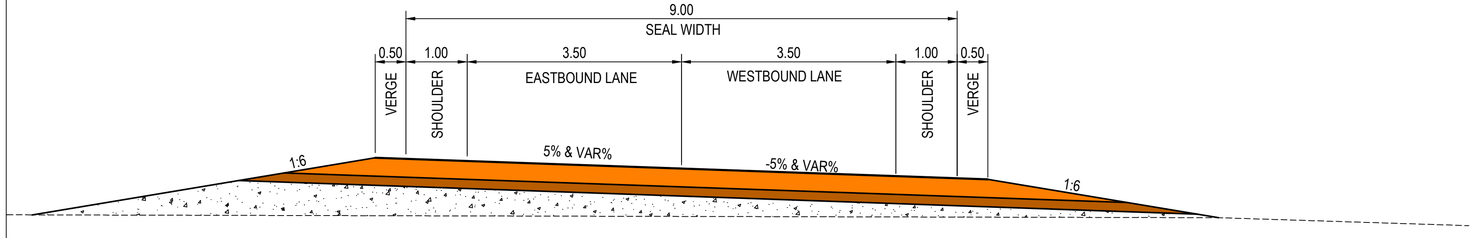
TYPICAL CROSS SECTION CH320-CH390
1:50



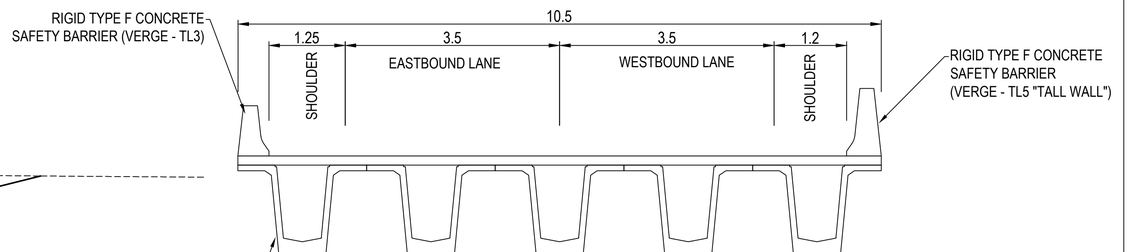
TYPICAL CROSS SECTION CH190-CH230 & CH1870-CH2020
1:50



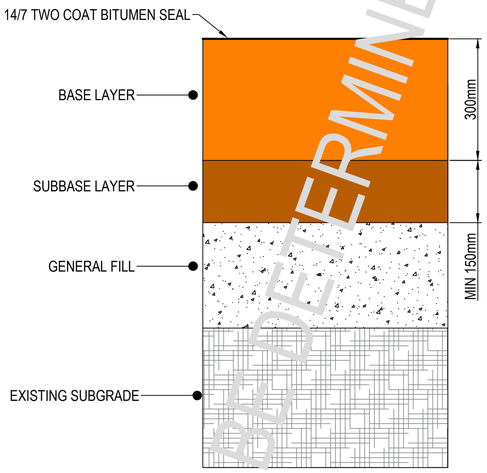
TYPICAL CROSS SECTION CH410-CH810 & CH845.5-CH1130
1:50



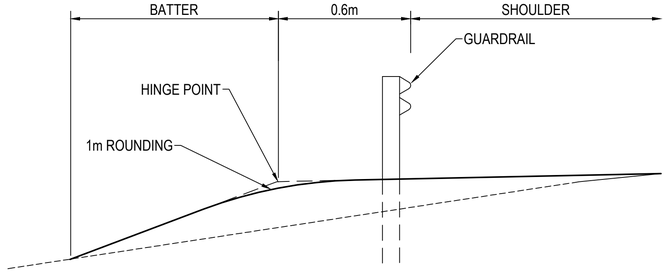
TYPICAL CROSS SECTION CH45-CH190, CH390-CH410 & CH1130-CH1870
1:50



TYPICAL CROSS SECTION BRIDGE
1:50



PAVEMENT DESIGN



VERGE TO BATTER DETAIL (GUARDRAIL)
NTS

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

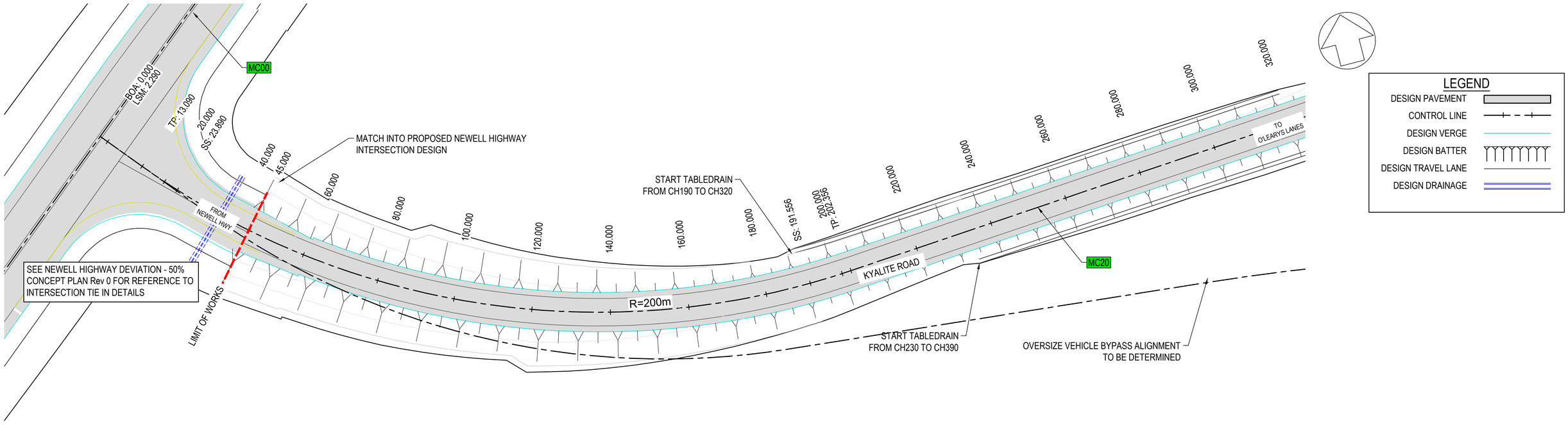
DRAWING TITLE: TYPICAL SECTIONS & PAVEMENT DETAILS (MC20)

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

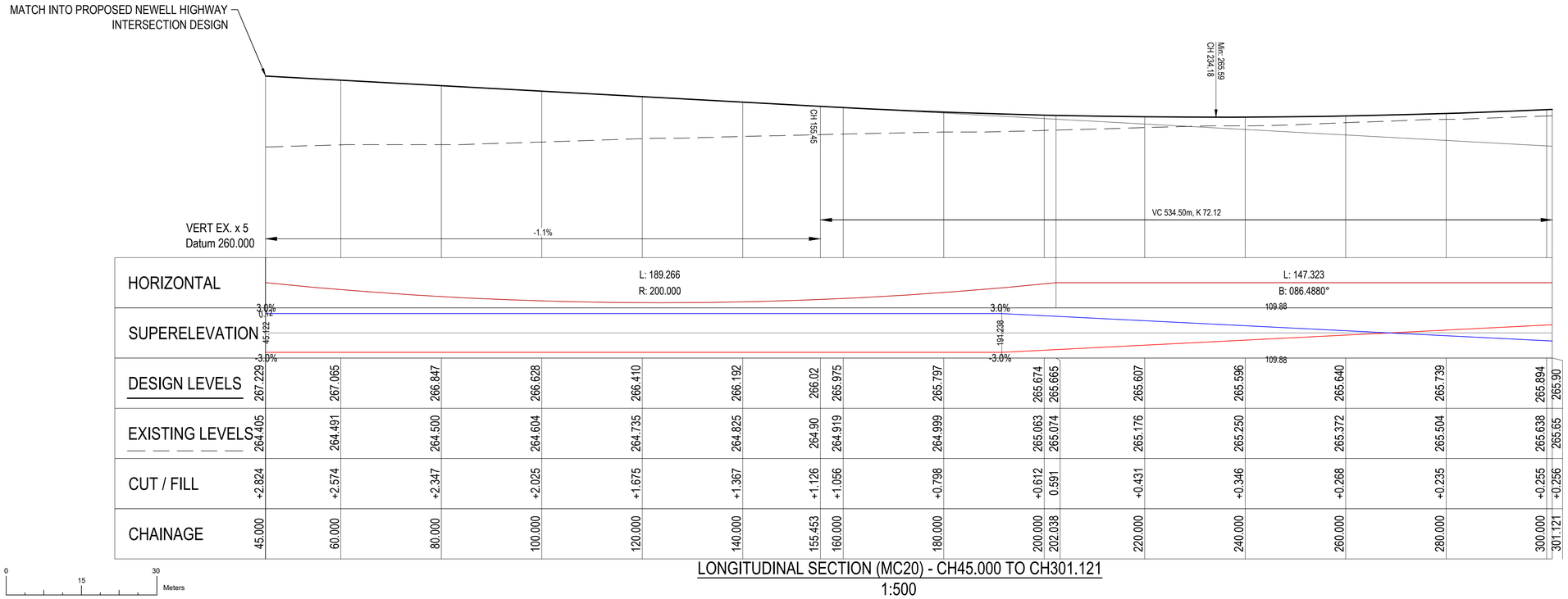
constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-2010	F



PLAN
1:500



LONGITUDINAL SECTION (MC20) - CH45.000 TO CH301.121
1:500

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

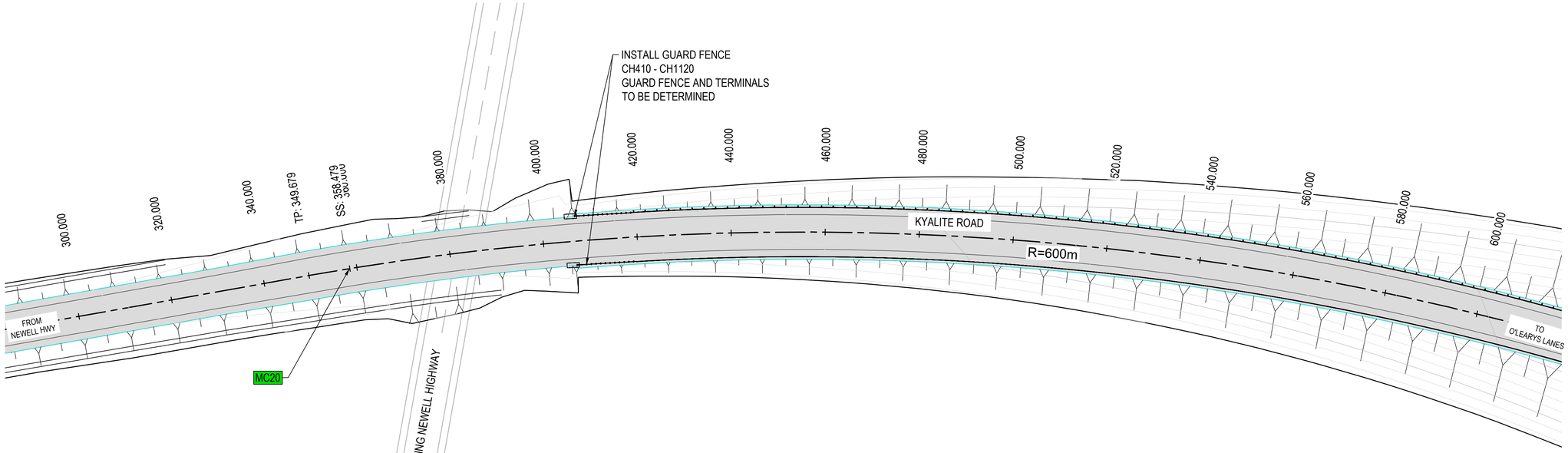
DRAWING TITLE: PLAN VIEW AND LONGITUDINAL SECTION - SHEET 1 OF 7 (MC20)

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

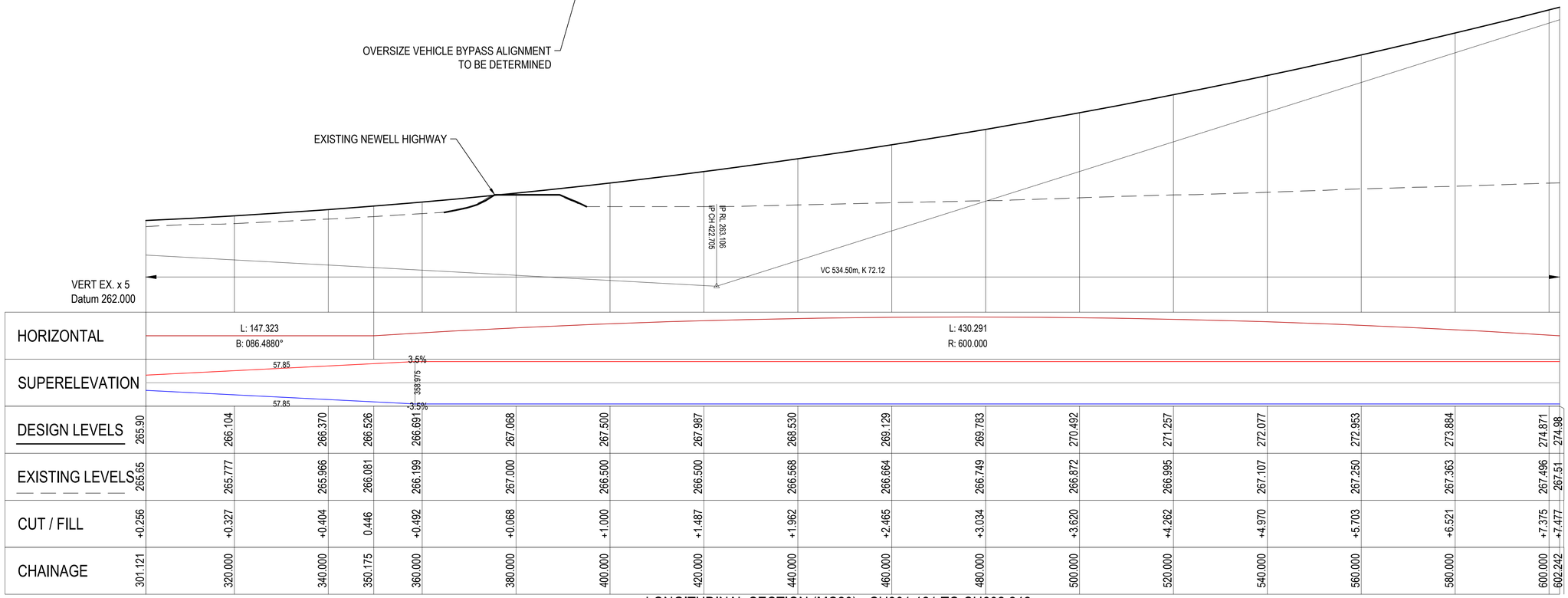
constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-2101	F



PLAN
1:500



0 15 30 Meters

LONGITUDINAL SECTION (MC20) - CH301.121 TO CH602.242
1:500

LEGEND
- DESIGN PAVEMENT
- CONTROL LINE
- DESIGN VERGE
- DESIGN BATTER
- DESIGN TRAVEL LANE
- DESIGN DRAINAGE

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

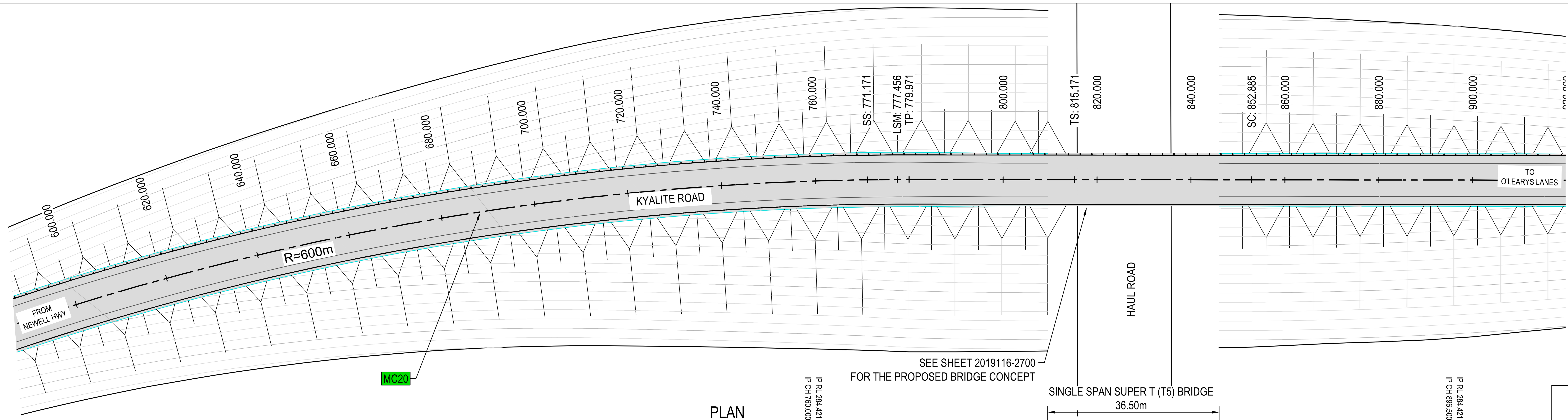
DRAWING TITLE: PLAN VIEW AND LONGITUDINAL SECTION - SHEET 2 OF 7 (MC20)

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

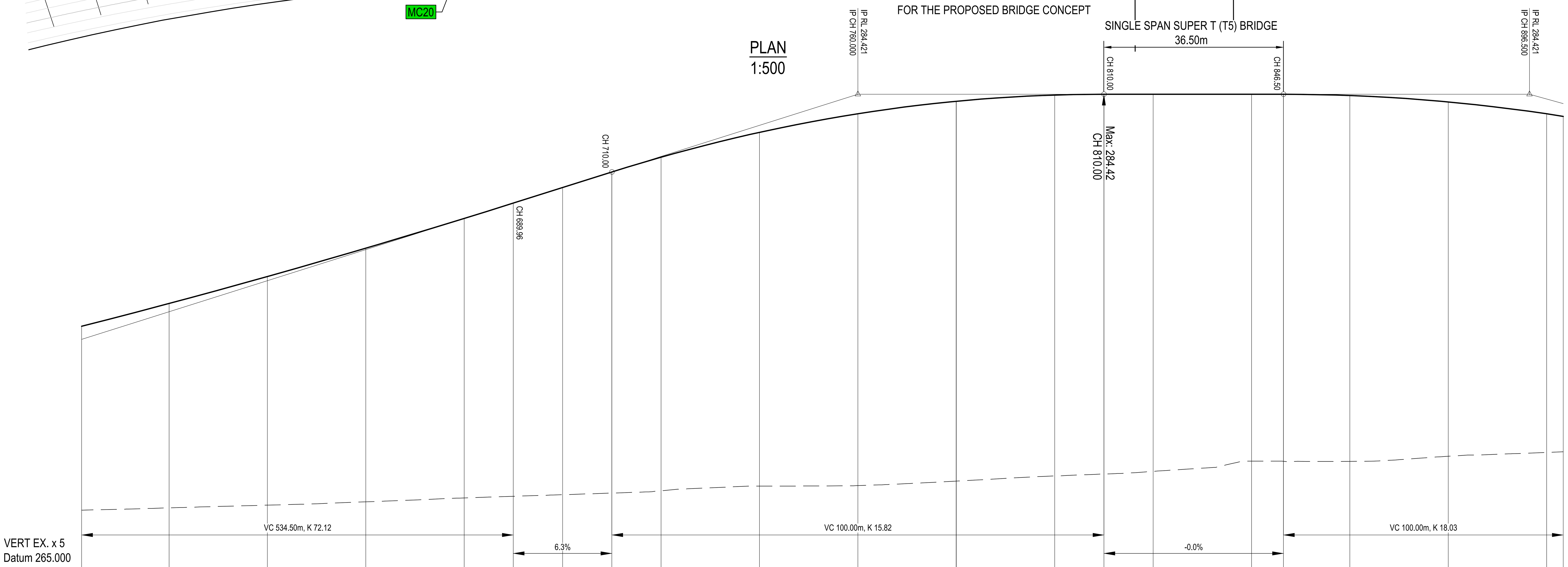
constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-2102	F



PLAN
1:500



LEGEND

- DESIGN PAVEMENT
- CONTROL LINE
- DESIGN VERGE
- DESIGN BATTER
- DESIGN TRAVEL LANE
- DESIGN DRAINAGE

HORIZONTAL: L: 430.291, R: 600.000 | L: 227.583, B: 127.5778°

SUPERELEVATION: 169.42 | 169.42 | 3.5% | -3.5% | 6.29 | 6.29 | 771.666 | 777.952 | 37.71 | 815.666 | 37.71 | 853.380 | -3.00% | -3.00%

CHAINAGE	602.242	620.000	640.000	660.000	680.000	689.957	700.000	710.000	720.000	740.000	760.000
DESIGN LEVELS	274.98	275.913	277.011	278.164	279.372	279.99	280.629	281.26	281.861	282.873	283.631
EXISTING LEVELS	267.51	267.601	267.712	267.847	268.007	268.07	268.137	268.20	268.297	268.486	268.506
CUT / FILL	+7.477	+8.312	+9.298	+10.316	+11.365	+11.923	+12.492	+13.058	+13.564	+14.387	+15.124

CHAINAGE	780.466	780.000	800.000	810.000	820.000	840.000	846.500	860.000	880.000	900.000	903.362
DESIGN LEVELS	284.145	284.136	284.389	284.42	284.421	284.421	284.42	284.370	284.110	283.627	283.52
EXISTING LEVELS	268.693	268.688	268.898	268.98	269.085	269.500	269.49	269.493	269.700	269.856	269.88
CUT / FILL	15.452	+15.448	+15.491	+15.443	+15.335	+14.921	+14.927	+14.877	+14.410	+13.771	+13.640

LONGITUDINAL SECTION (MC20) -
CH602.242 TO CH903.382
1:500

0 15 30 Meters

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION 56.3km TO 64.1km NORTH OF PARKES

DRAWING TITLE: PLAN VIEW AND LONGITUDINAL SECTION - SHEET 3 OF 7 (MC20)

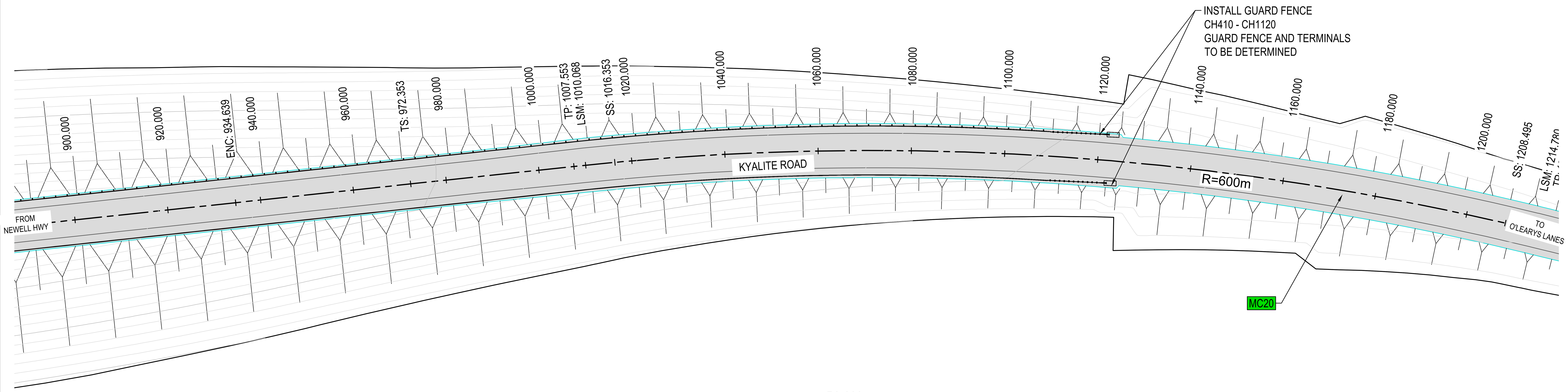
CLIENT: TOMINGLEY GOLD OPERATIONS PTY LTD (A wholly owned subsidiary of Alkane Resources Ltd)

constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1

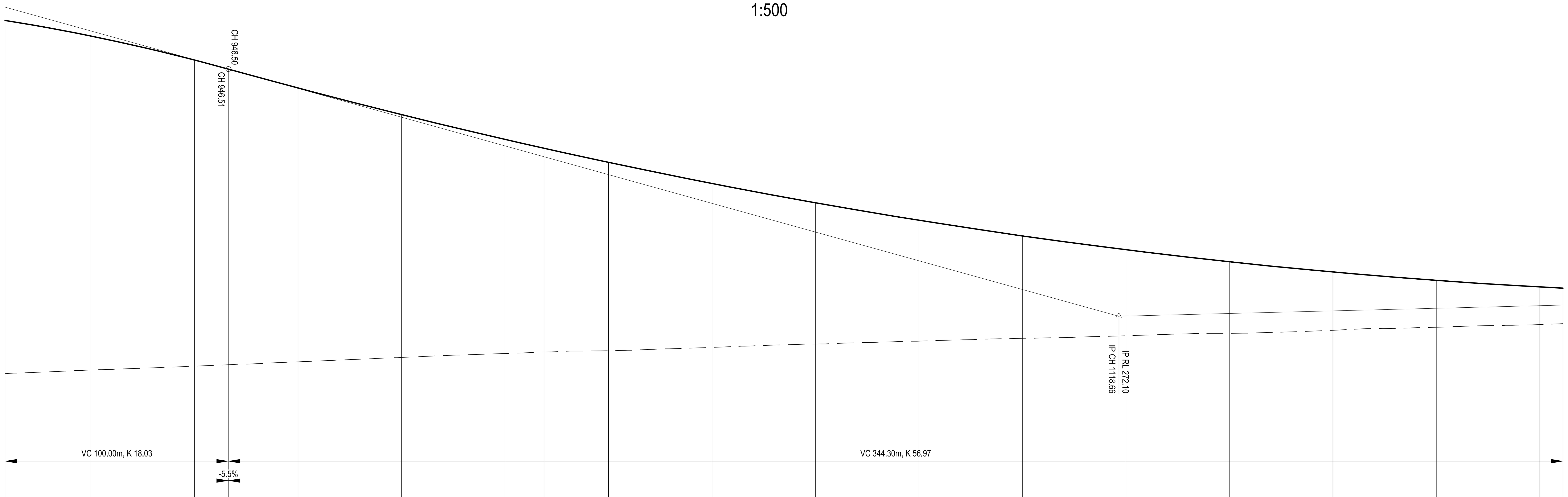
DRAWING NUMBER	REV
2019116-2103	F



LEGEND

- DESIGN PAVEMENT
- CONTROL LINE
- DESIGN VERGE
- DESIGN BATTER
- DESIGN TRAVEL LANE
- DESIGN DRAINAGE

PLAN
1:500



VERT EX. x 5
Datum 265.000

HORIZONTAL: L: 227.583, B: 127.5778° | L: 209.741, R: 600.000

SUPERELEVATION: -3.00% / -3.00% at 935.134; 37.71; 972.849; 37.71; 1010.563; 6.29; 1016.849; 6.29; 3.5% / -3.5%

CHAINAGE	DESIGN LEVELS	EXISTING LEVELS	CUT / FILL
903.362	283.52	269.88	+13.640
920.000	282.923	270.021	+12.902
940.000	281.997	270.169	+11.828
946.500	281.65	270.22	+11.424
946.507	281.65	270.22	+11.423
960.000	280.915	270.339	+10.576
980.000	279.889	270.508	+9.381
1000.000	278.932	270.660	+8.272
1008.049	278.567	270.719	7.848
1020.000	278.046	270.767	+7.279
1040.000	277.230	270.896	+6.334
1060.000	276.484	271.025	+5.459
1080.000	275.808	271.135	+4.673
1100.000	275.203	271.249	+3.954
1120.000	274.668	271.342	+3.326
1140.000	274.203	271.438	+2.765
1160.000	273.808	271.556	+2.252
1180.000	273.484	271.672	+1.812
1200.000	273.229	271.778	+1.451
1204.483	273.18	271.81	+1.373

0 15 30 Meters

LONGITUDINAL SECTION (MC20) - CH903.382 TO CH1204.483
1:500

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION 56.3km TO 64.1km NORTH OF PARKES

DRAWING TITLE: PLAN VIEW AND LONGITUDINAL SECTION - SHEET 4 OF 7 (MC20)

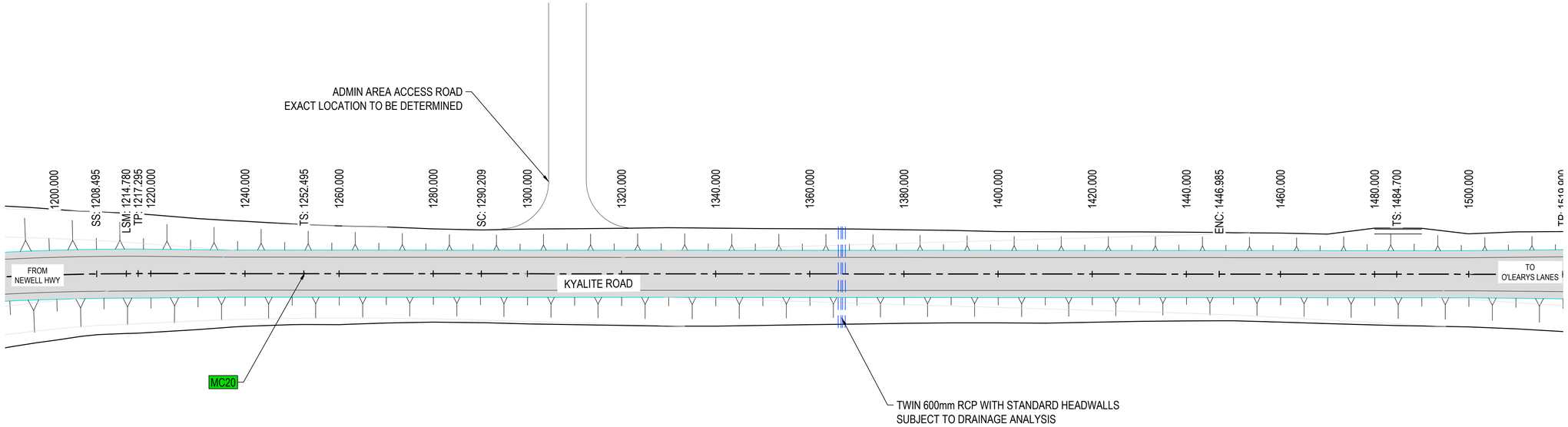
CLIENT: TOMINGLEY GOLD OPERATIONS PTY LTD (A wholly owned subsidiary of Alkane Resources Ltd)

constructive solutions
providing total solutions

50% CONCEPT

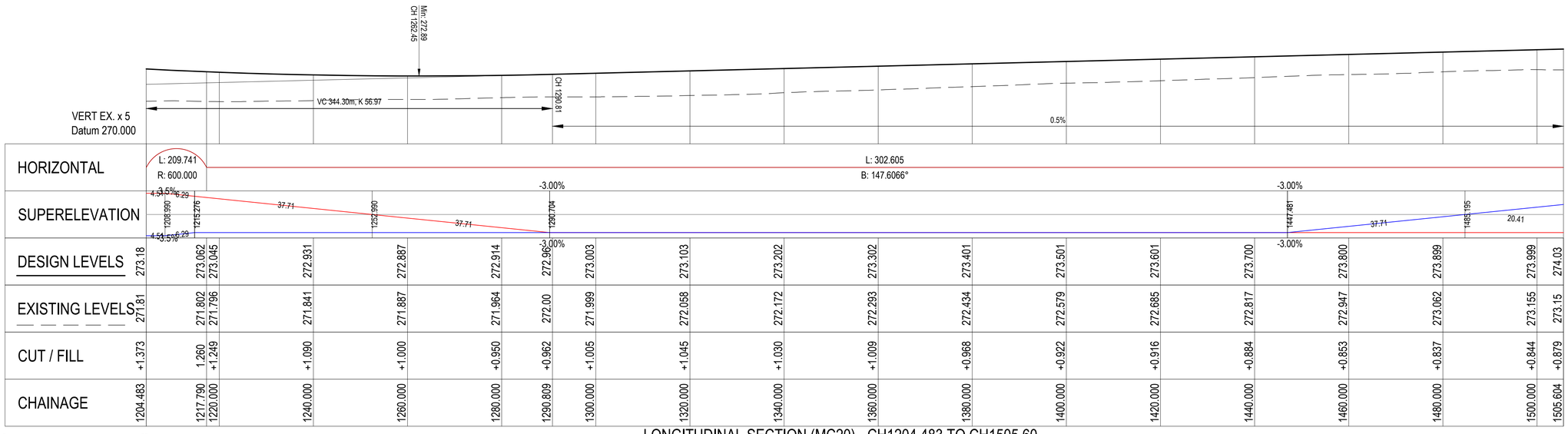
TfNWS REGISTRATION No.	SIZE
2019116	A1

DRAWING NUMBER	REV
2019116-2104	F



PLAN
1:500

LEGEND
- DESIGN PAVEMENT
- CONTROL LINE
- DESIGN VERGE
- DESIGN BATTER
- DESIGN TRAVEL LANE
- DESIGN DRAINAGE



LONGITUDINAL SECTION (MC20) - CH1204.483 TO CH1505.60
1:500

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

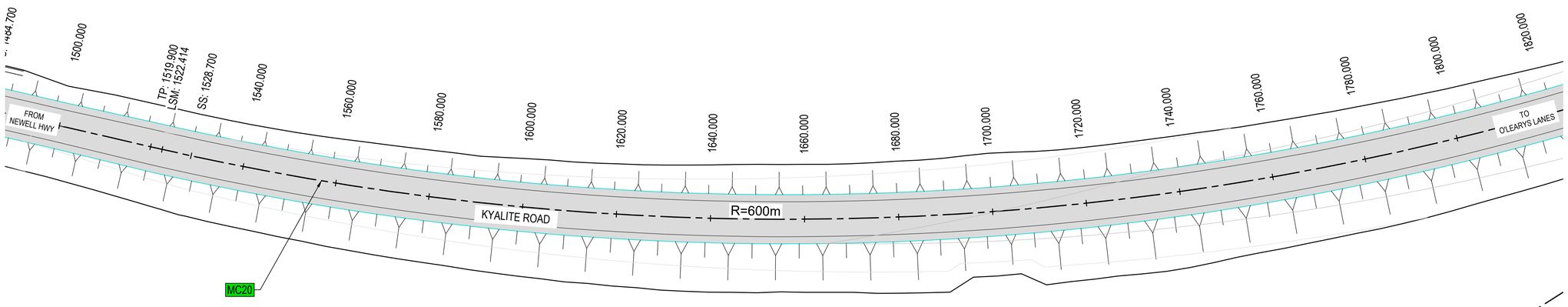
DRAWING TITLE: PLAN VIEW AND LONGITUDINAL SECTION - SHEET 5 OF 7 (MC20)

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

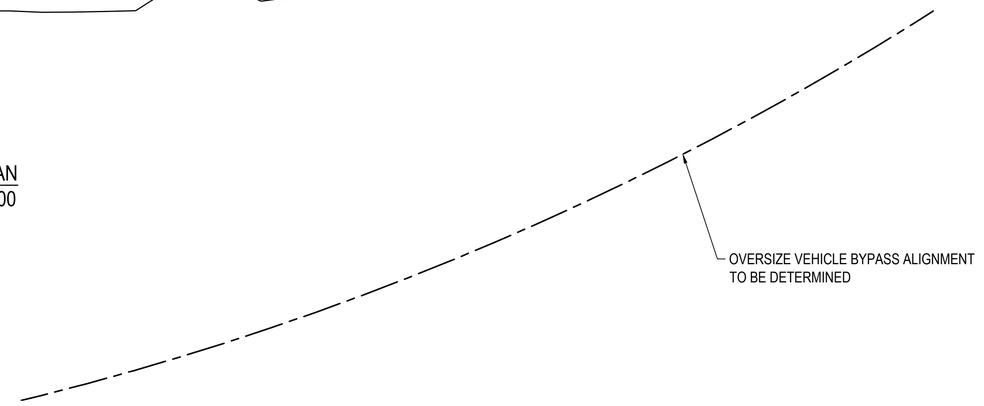
constructive solutions
providing total solutions

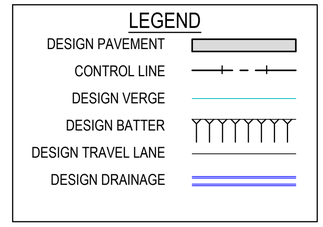
50% CONCEPT

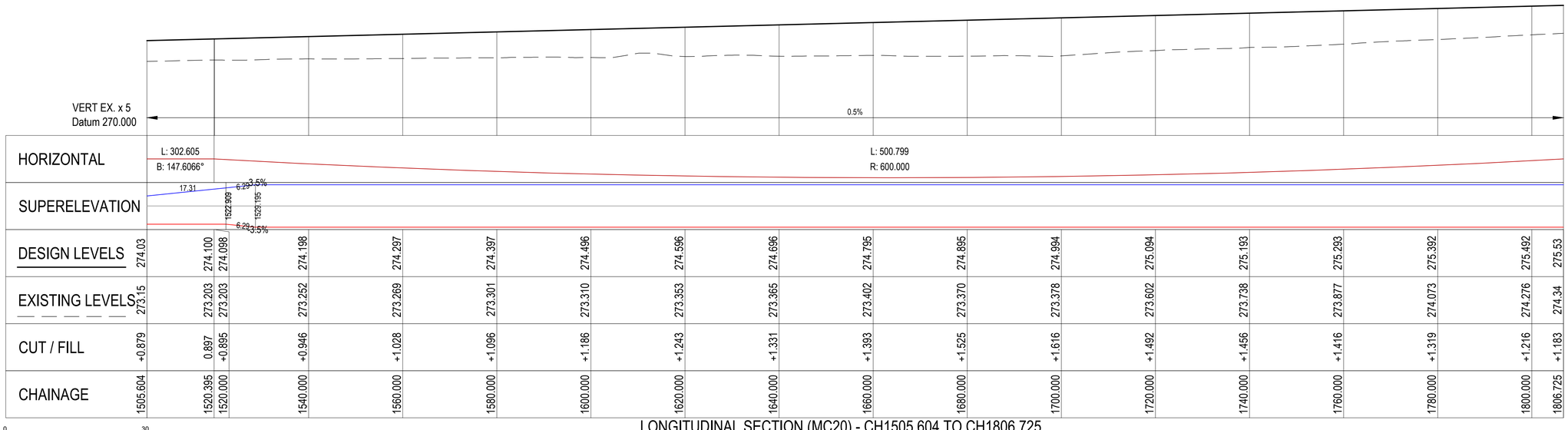
TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-2105	F



PLAN
1:500







0 15 30 Meters

LONGITUDINAL SECTION (MC20) - CH1505.604 TO CH1806.725
1:500

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

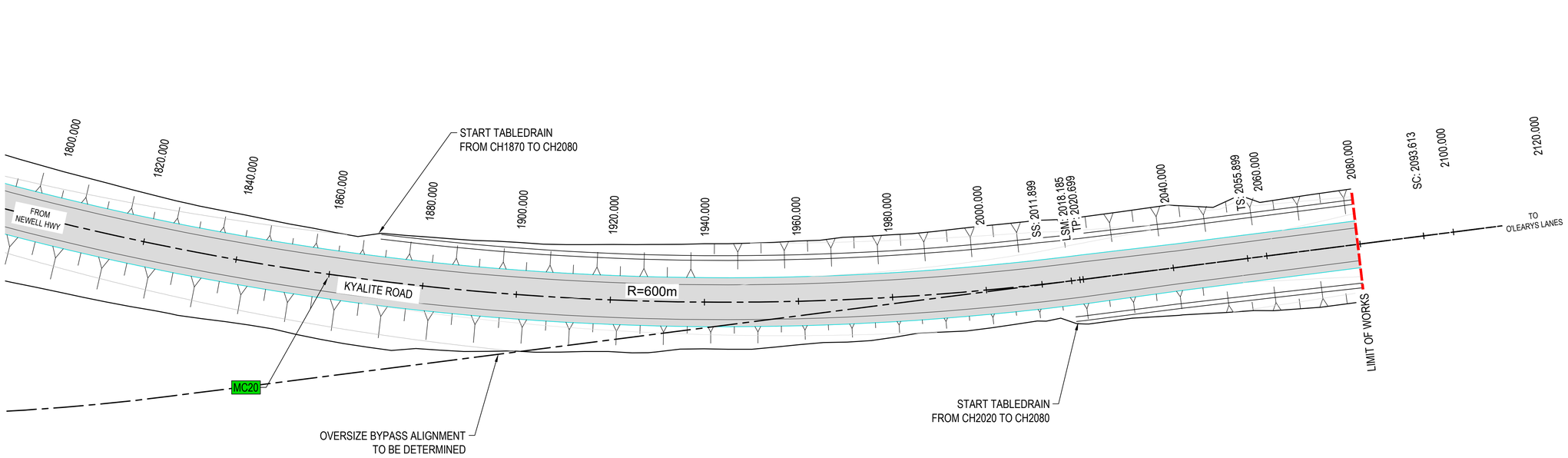
DRAWING TITLE: PLAN VIEW AND LONGITUDINAL SECTION - SHEET 6 OF 7 (MC20)

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

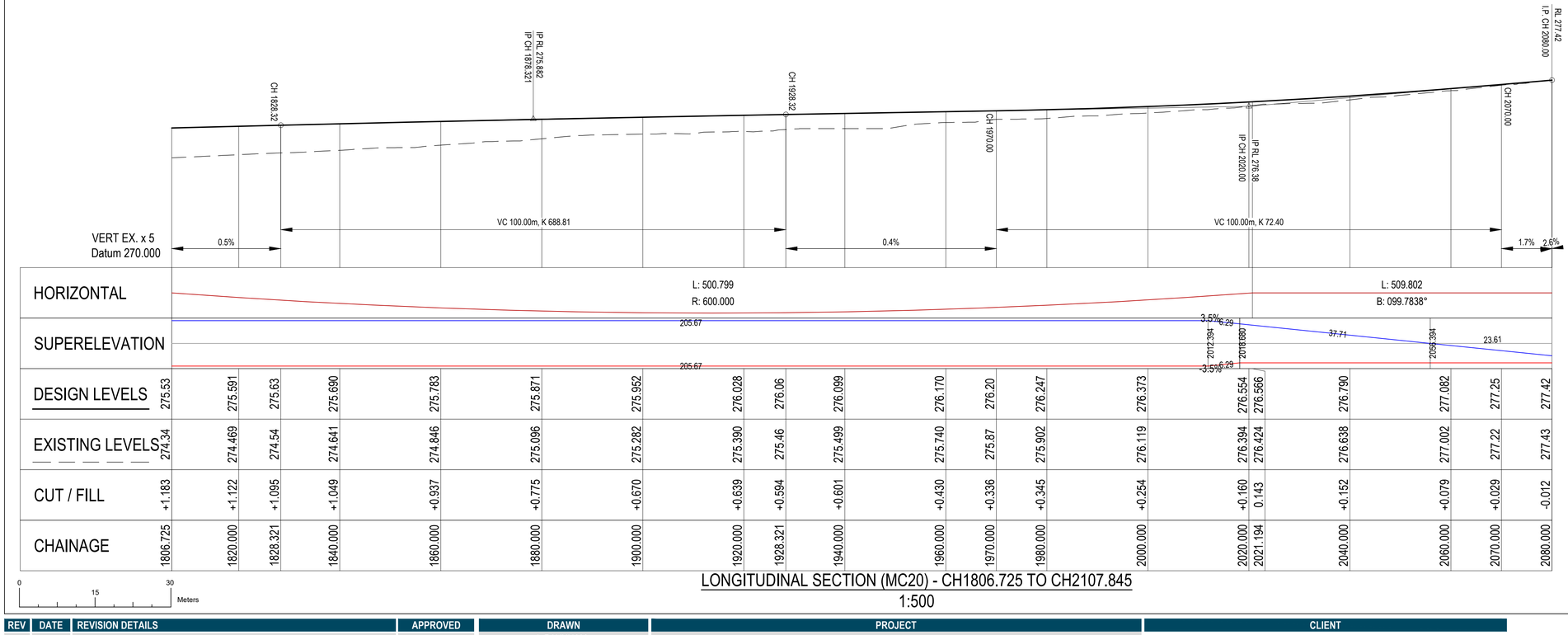
constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-2106	F



PLAN
1:500



LONGITUDINAL SECTION (MC20) - CH1806.725 TO CH2107.845
1:500

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

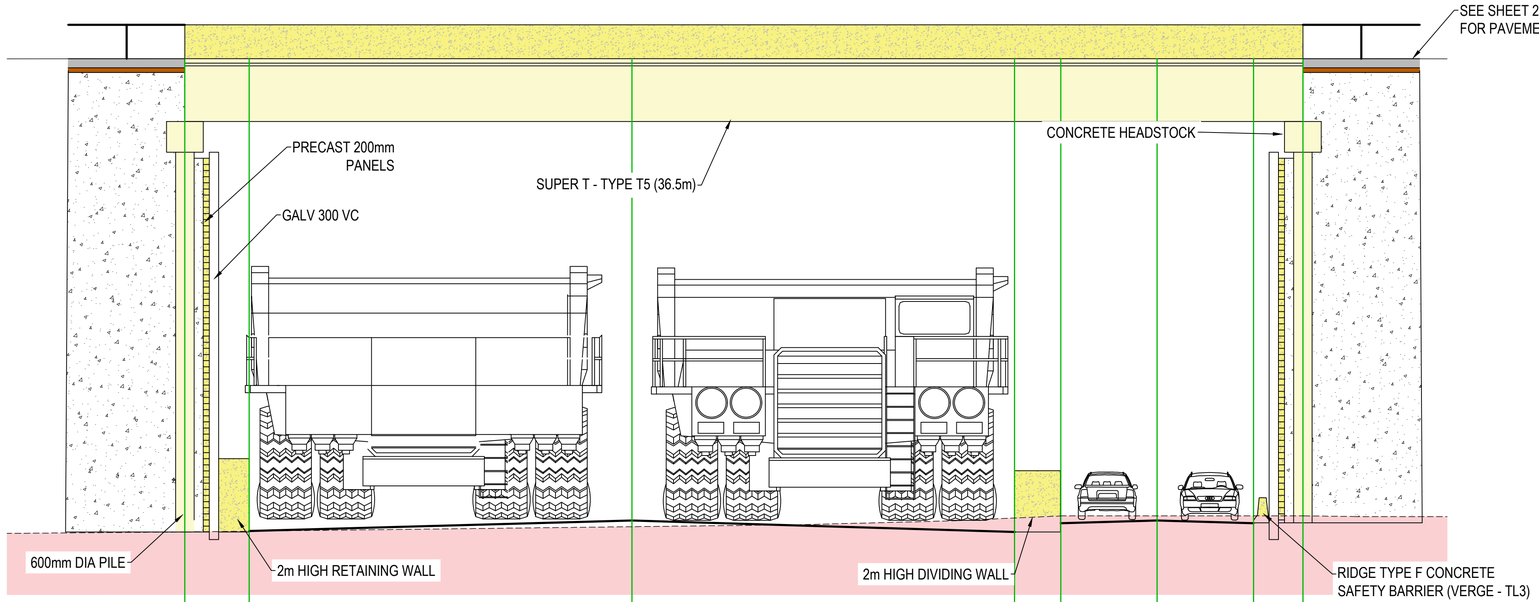
DRAWING TITLE: PLAN VIEW AND LONGITUDINAL SECTION - SHEET 7 OF 7 (MC20)

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

constructive solutions
providing total solutions

50% CONCEPT

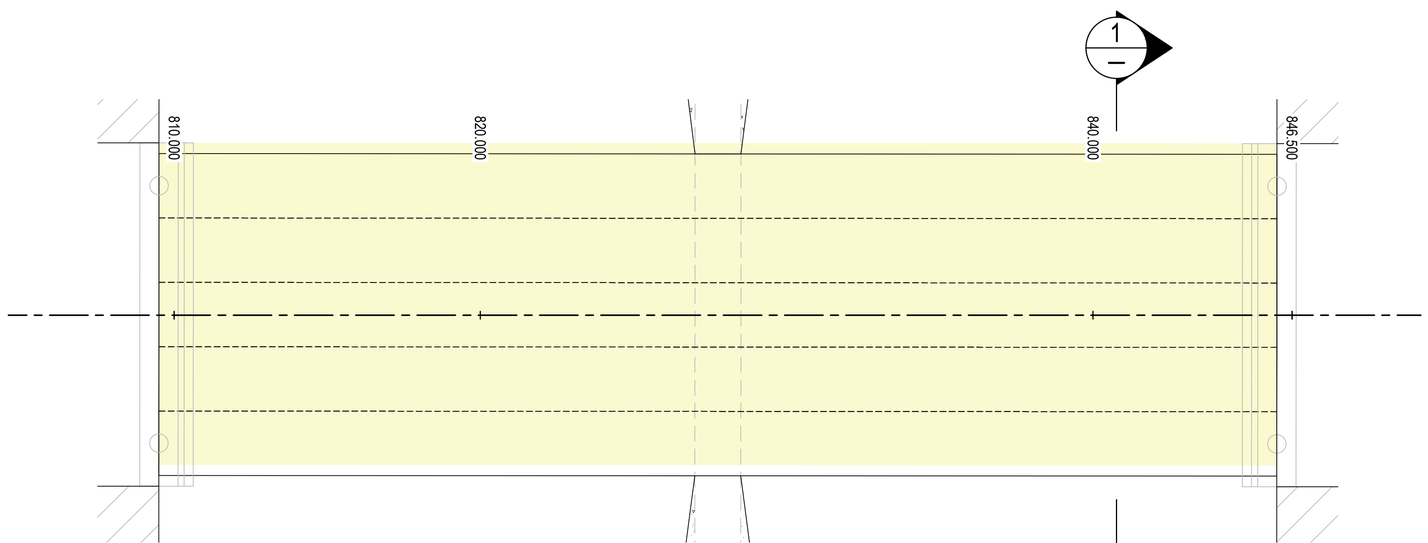
TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-2107	F



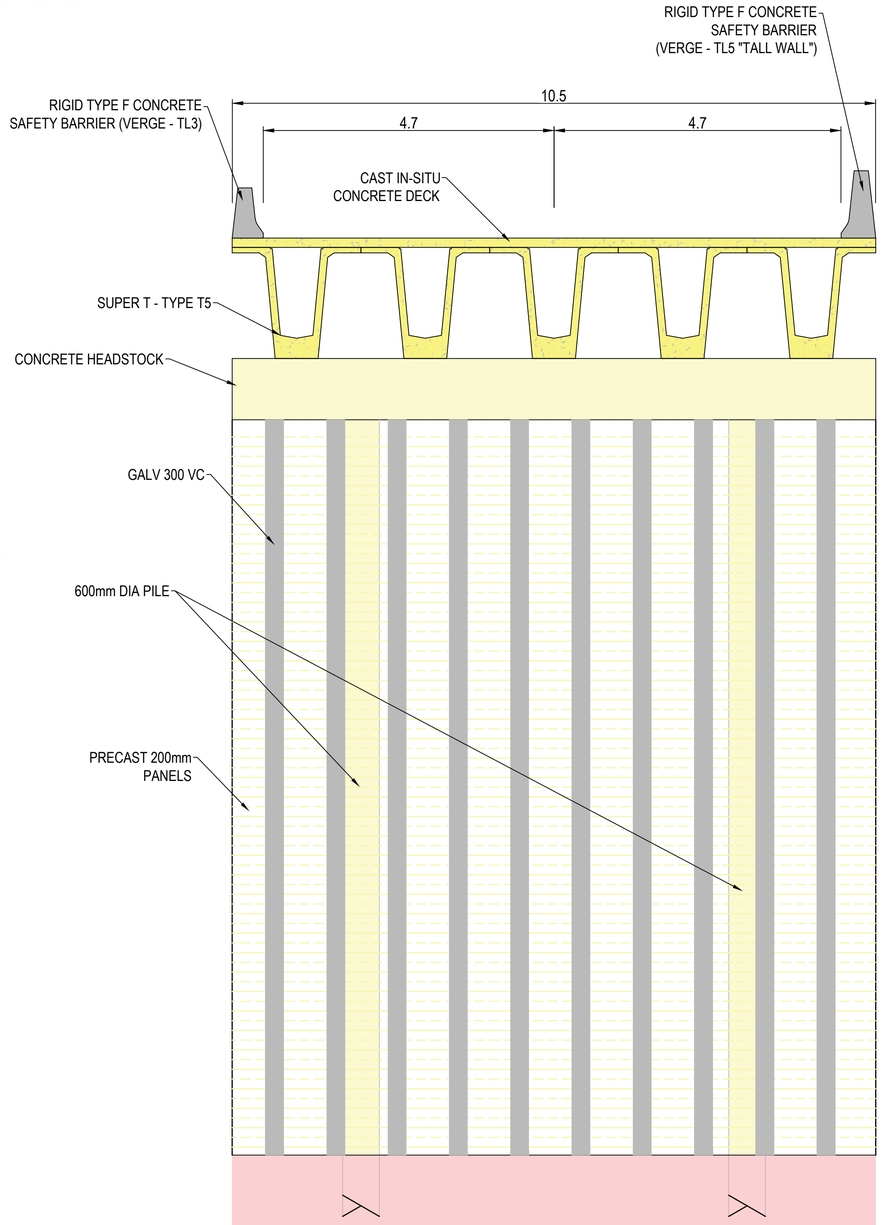
RL 266.000

MC20 - DESIGN LEVEL	284.420	284.420	284.420	284.420	284.420	284.420	284.420	284.420	
HAUL ROAD DESIGN LEVEL		268.945	269.320	268.945	269.226	269.320	269.226		
CHAINAGE	810.000	812.100	824.600	837.100	838.600	841.750	844.900	846.500	

SINGLE SPAN SUPER T BRIDGE - ELEVATION VIEW
1:100



SINGLE SPAN SUPER T BRIDGE - PLAN VIEW
1:100



SECTION 1 — 1
1:50

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

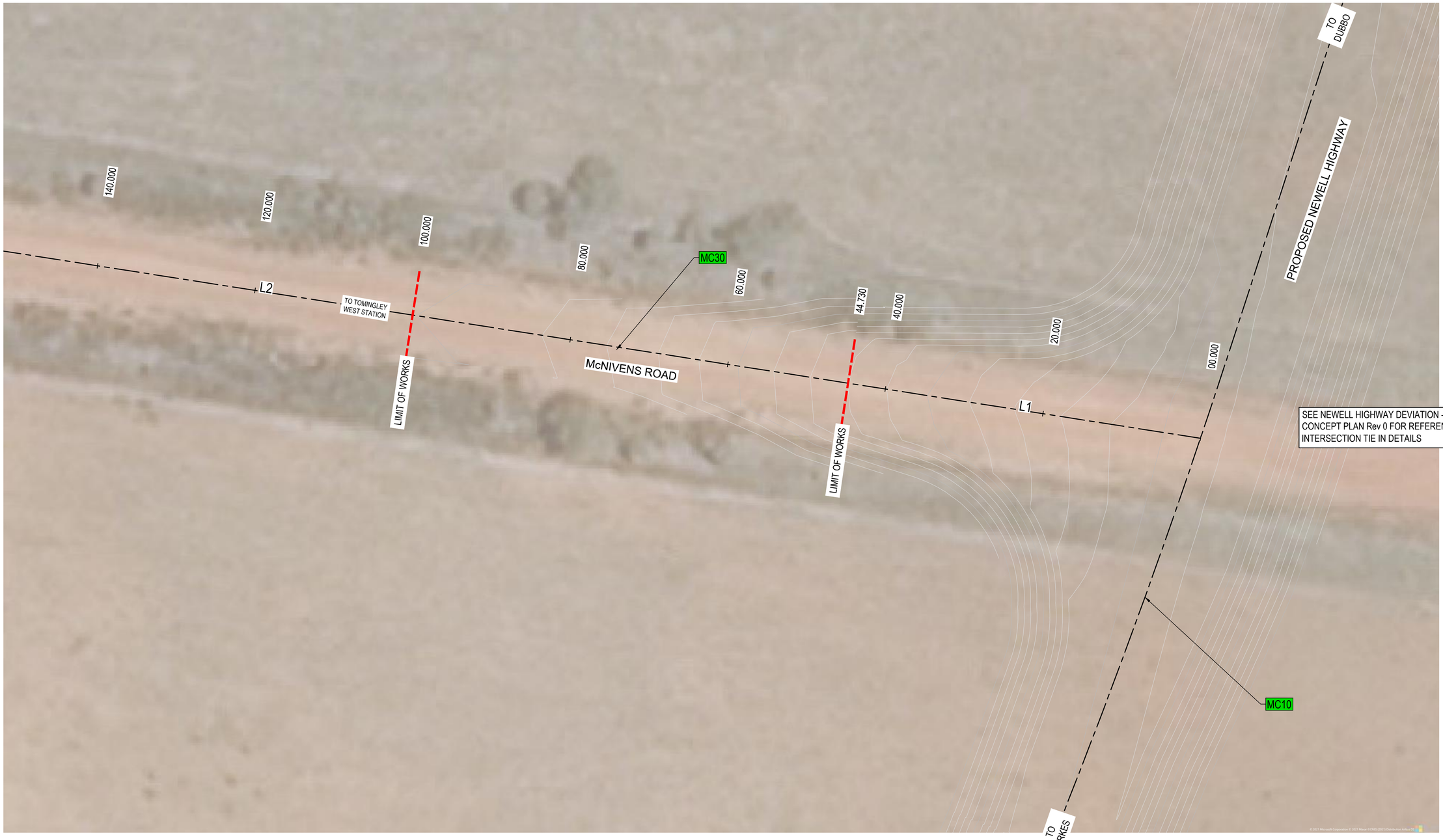
DRAWING TITLE: PROPOSED KYALITE ROAD OVERPASS (MC20)

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

constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-2700	F



PLAN OVERVIEW
1:250

CUL-DE-SAC TO BE CONSTRUCTED AT THE END OF KYALITE AROUND, LOCATED AFTER THE LAST FARM ACCESS

ROAD SHEETS	
ROAD	ALIGNMENT
BACK TOMINGLEY WEST ROAD	MC10
KYALITE ROAD	MC20
McNIVENS ROAD	MC30

0 7.5 15 Meters

Set Out Table for MC-30							
TAG		CHAINAGE	EASTING	NORTHING	LENGTH	RADIUS	BEARING
L1	BP EP	0.000 44.730	614197.157 614152.965	6392325.004 6392331.917	44.730		278.8916
L2	BP EP	44.730 192.581	614152.965 614006.891	6392331.917 6392354.770	147.851		278.8916

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

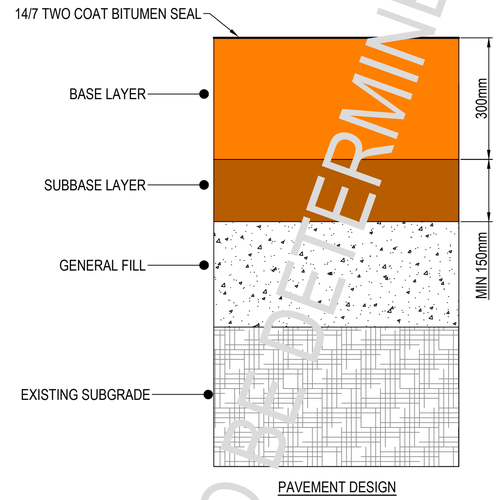
DRAWING TITLE: PLAN OVERVIEW AND ALIGNMENT TABLE (MC30)

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

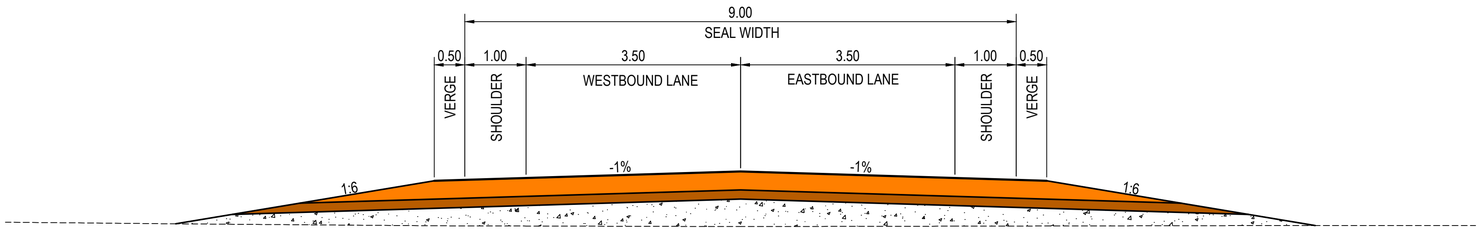
constructive solutions
providing total solutions

50% CONCEPT

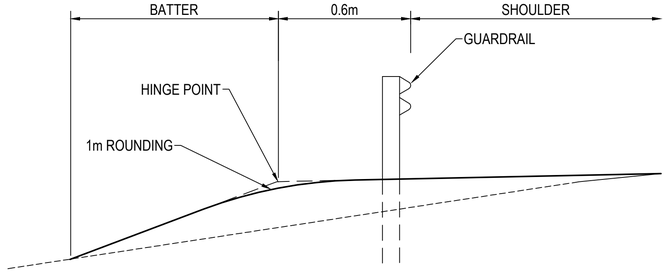
TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-3001	F



PAVEMENT DESIGN



TYPICAL CROSS SECTION CH44.730 TO CH100.000
1:50



VERGE TO BATTER DETAIL (GUARDRAIL)
NTS

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN	L.BAYNHAM
DESIGNED	L.BAYNHAM
CHECKED	S.O'ROURKE
APPROVED	S.O'ROURKE

PROJECT

NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

DRAWING TITLE

TYPICAL SECTIONS & PAVEMENT DETAILS (MC30)

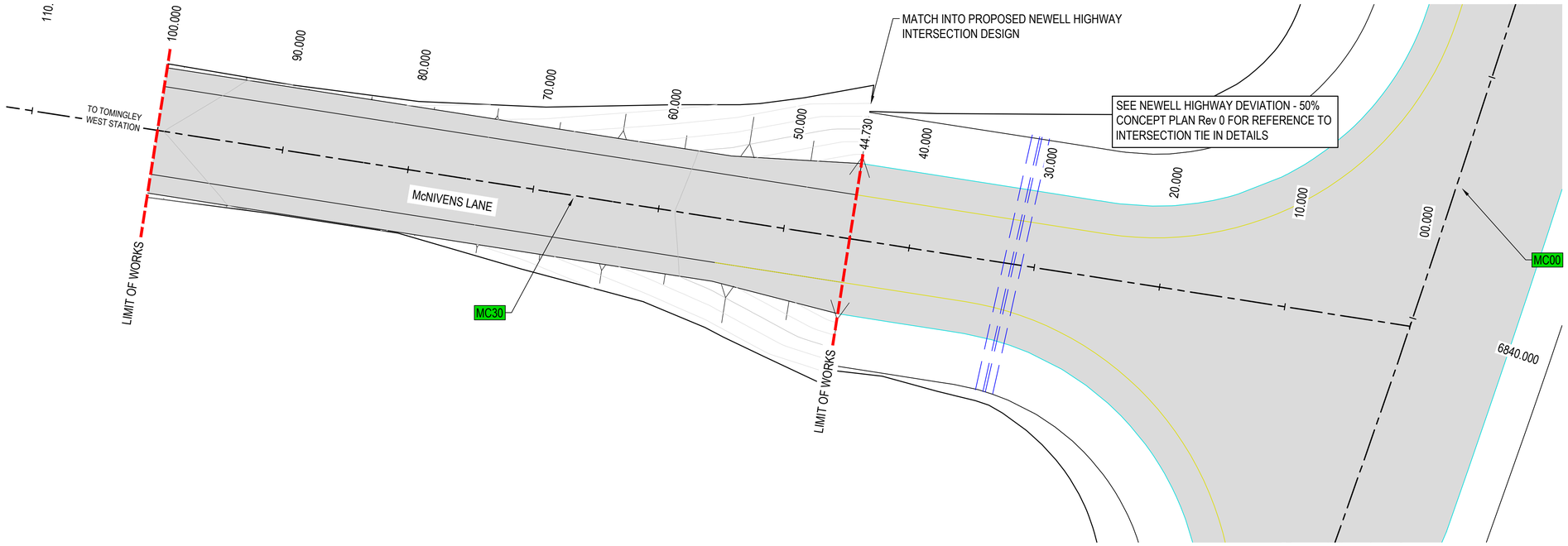
CLIENT

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

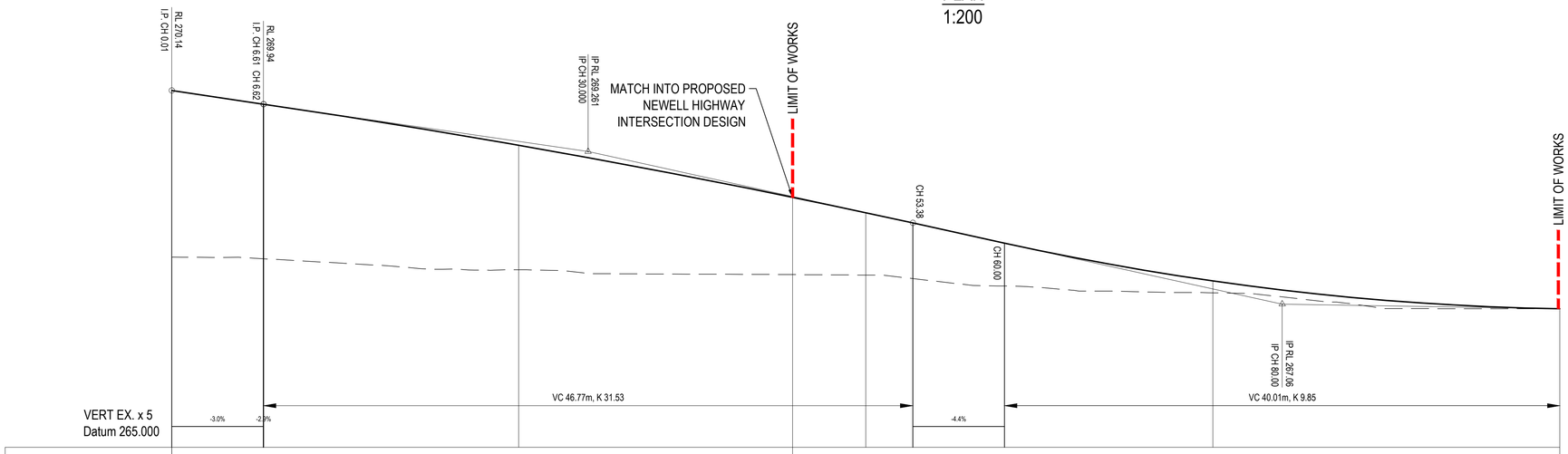
constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-3010	F



PLAN
1:200



HORIZONTAL	L: 44.730 B: 278.8916°						L: 147.851 B: 278.8916°			
DESIGN LEVELS	270.14	269.94	269.353	268.602	268.380	268.23	267.94	267.397	267.00	
EXISTING LEVELS	267.740	267.74	267.72	267.558	267.489	267.482	267.43	267.32	267.226	267.00
CUT / FILL	+2.400	+2.225	+1.795	1.113	+0.898	+0.802	+0.618	+0.171	+0.001	
CHAINAGE	0.000	0.007	6.615	25.000	44.730	50.000	53.385	59.996	75.000	100.000

0 6 12 Meters

LONGITUDINAL SECTION - CH0.000 TO CH100.000
1:200

REV	DATE	REVISION DETAILS	APPROVED
F	21-06-21	50% CONCEPT DESIGN FOR COUNCIL REVIEW	SOR
E	15-06-21	50% CONCEPT DESIGN FOR CLIENT REVIEW	SOR
D	04-06-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN: L.BAYNHAM
DESIGNED: L.BAYNHAM
CHECKED: S.O'ROURKE
APPROVED: S.O'ROURKE

PROJECT: NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION 56.3km TO 64.1km NORTH OF PARKES

DRAWING TITLE: PLAN VIEW AND LONGITUDINAL SECTION (MC30)

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

constructive solutions
providing total solutions

50% CONCEPT

TfNWS REGISTRATION No.	SIZE
2019116	A1
DRAWING NUMBER	REV
2019116-3101	F

Appendix 5: HW17 Realignment - Rural Property Access Locations

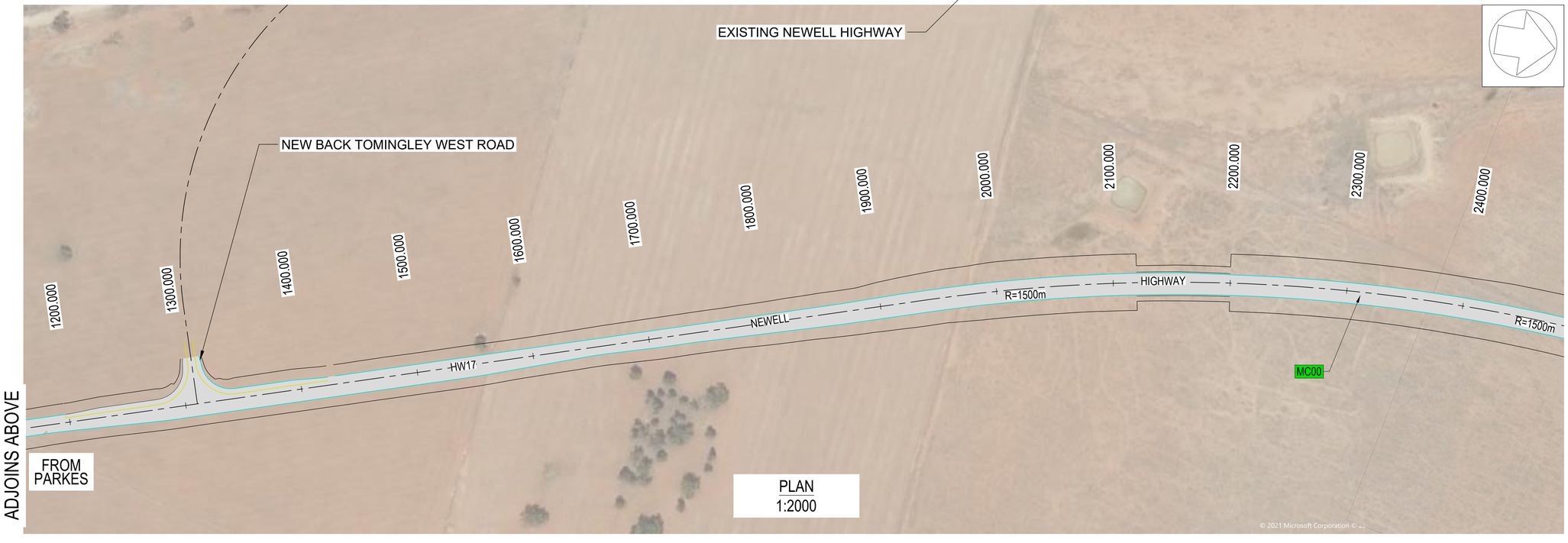
PLAN
1:2000

LEGEND

CONTROL LINE

DESIGN VERGE

DESIGN BATTER



PLAN
1:2000

0 60 120 Meters

REV	DATE	REVISION DETAILS	APPROVED
1	15-07-21	50% CONCEPT DESIGN CLOSE-OUT	SOR
0	14-05-21	50% CONCEPT DESIGN FOR CLIENT & TfNSW REVIEW	SOR
D	12-05-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN	L.BAYNHAM
DESIGNED	L.BAYNHAM
CHECKED	S.O'ROURKE
APPROVED	S.O'ROURKE

PROJECT

NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

DRAWING TITLE

PROPERTY PLAN - SHEET 1 OF 4

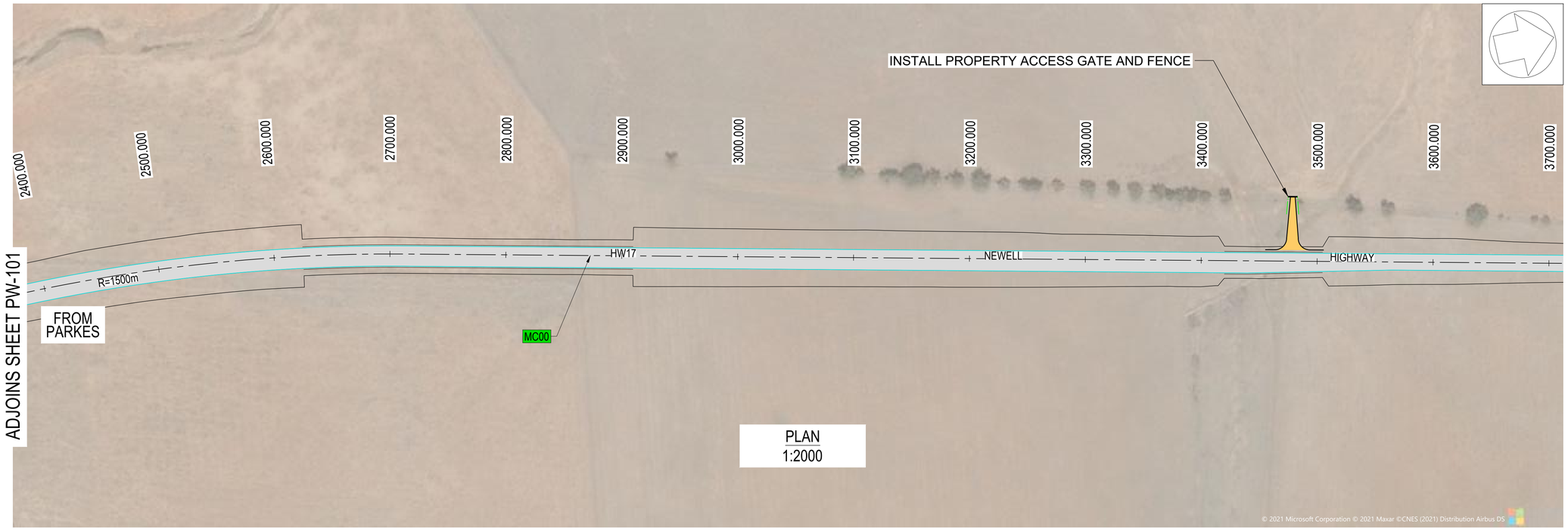
CLIENT

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

constructive solutions
providing total solutions

50% CONCEPT DESIGN

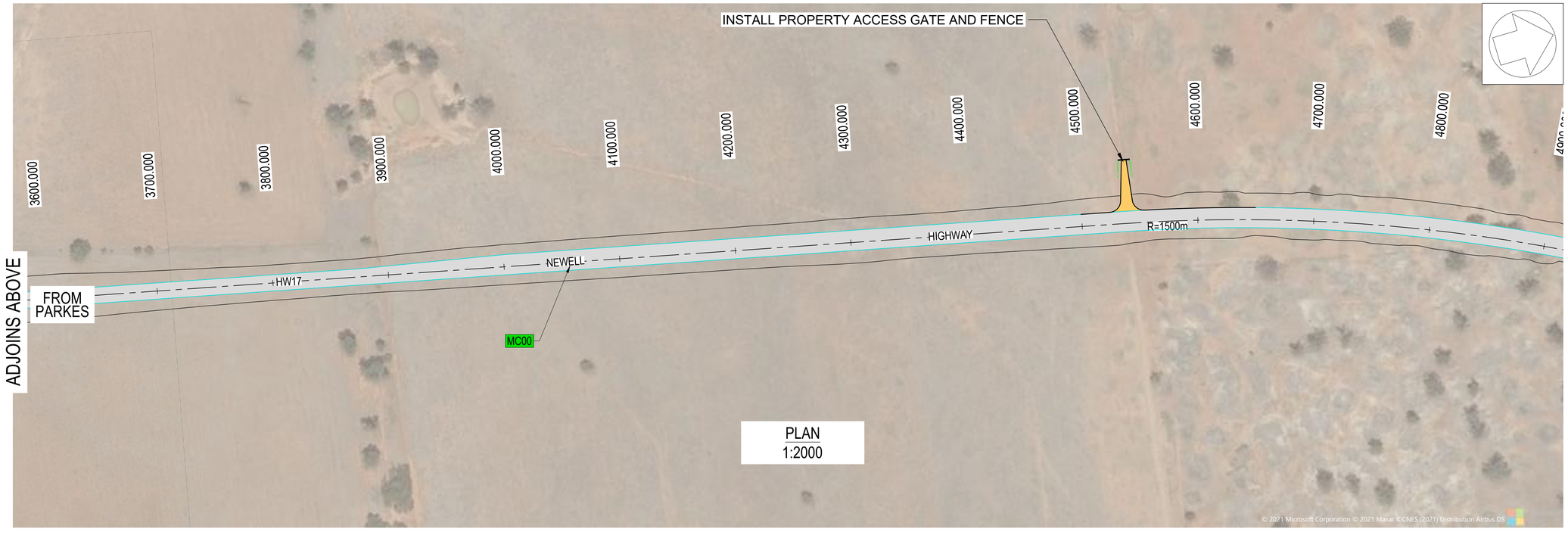
TfNWS REGISTRATION No.	SIZE
TBC	A1
DRAWING NUMBER	**REV**
PW-101	1



PLAN
1:2000

LEGEND

- CONTROL LINE
- DESIGN VERGE
- DESIGN BATTER



PLAN
1:2000

0 60 120
Meters

REV	DATE	REVISION DETAILS	APPROVED
1	15-07-21	50% CONCEPT DESIGN CLOSE-OUT	SOR
0	14-05-21	50% CONCEPT DESIGN FOR CLIENT & TfNSW REVIEW	SOR
D	12-05-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN	DESIGNED	CHECKED	APPROVED
L.BAYNHAM	L.BAYNHAM	S.O'ROURKE	S.O'ROURKE

PROJECT
NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

DRAWING TITLE
PROPERTY PLAN - SHEET 2 OF 4

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

constructive solutions
providing total solutions

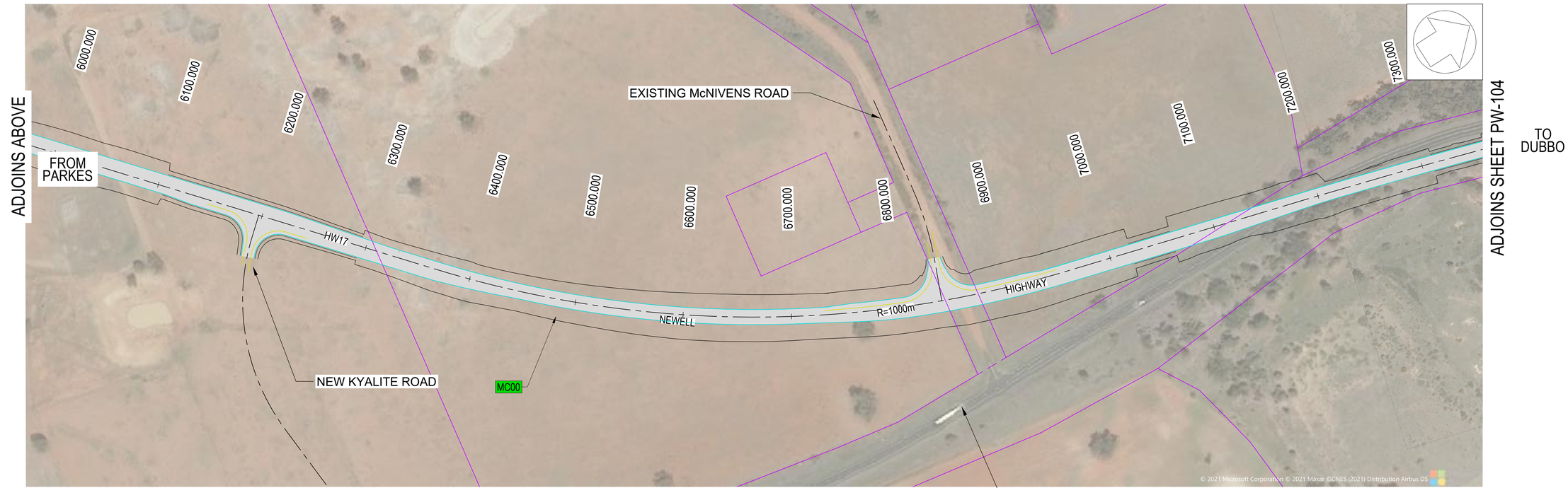
50% CONCEPT DESIGN

TfNWS REGISTRATION No.	SIZE
TBC	A1
DRAWING NUMBER	**REV**
PW-102	1

PLAN
1:2000

LEGEND

- CONTROL LINE
- DESIGN VERGE
- DESIGN BATTER



PLAN
1:2000

0 60 120 Meters

REV	DATE	REVISION DETAILS	APPROVED
1	15-07-21	50% CONCEPT DESIGN CLOSE-OUT	SOR
0	14-05-21	50% CONCEPT DESIGN FOR CLIENT & TfNSW REVIEW	SOR
D	12-05-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN	DESIGNED	CHECKED	APPROVED
L.BAYNHAM	L.BAYNHAM	S.O'ROURKE	S.O'ROURKE

PROJECT
NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

DRAWING TITLE
PROPERTY PLAN - SHEET 3 OF 4

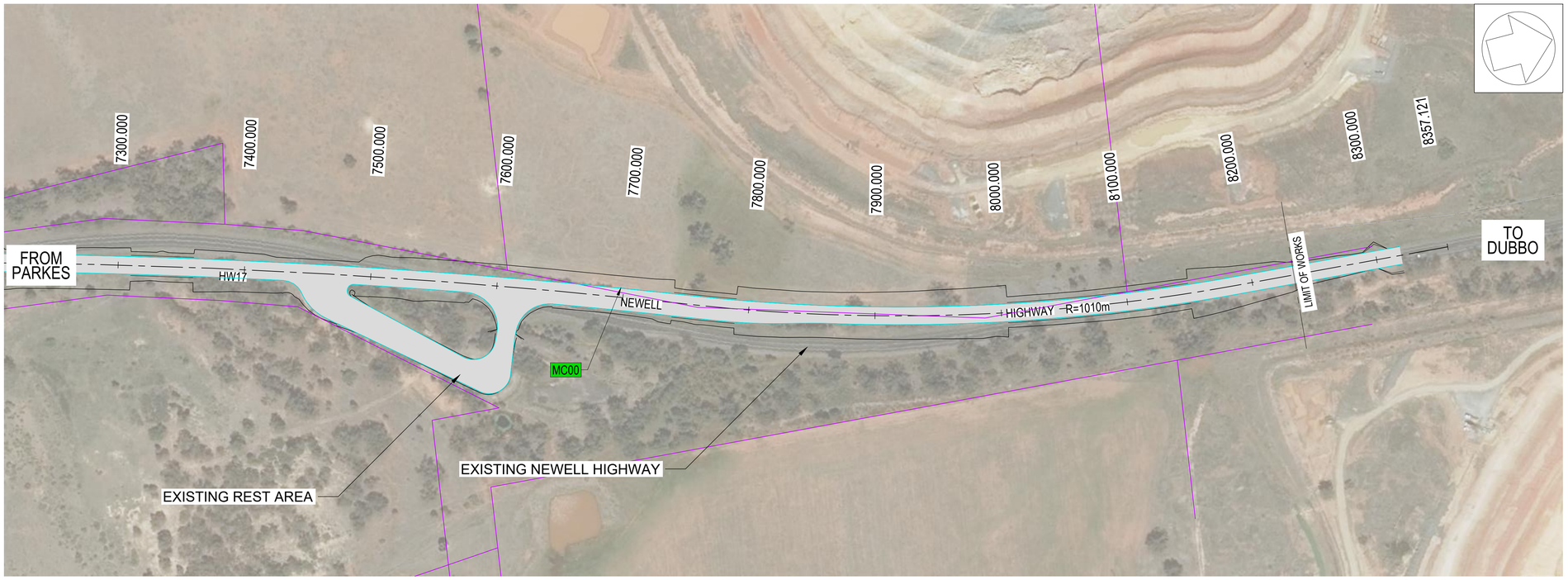
CLIENT
TOMINGLEY GOLD OPERATIONS PTY LTD
(A wholly owned subsidiary of Alkane Resources Ltd)

constructive solutions
providing total solutions

50% CONCEPT DESIGN

TfNWS REGISTRATION No.	SIZE
TBC	A1
DRAWING NUMBER	**REV**
PW-103	1

ADJOINS SHEET PW-103



LEGEND

- CONTROL LINE
- DESIGN VERGE
- DESIGN BATTER

PLAN
1:2000

0 60 120 Meters

REV	DATE	REVISION DETAILS	APPROVED
1	15-07-21	50% CONCEPT DESIGN CLOSE-OUT	SOR
0	14-05-21	50% CONCEPT DESIGN FOR CLIENT & TfNSW REVIEW	SOR
D	12-05-21	50% CONCEPT DESIGN FOR INTERNAL REVIEW	SOR

DRAWN	DESIGNED	CHECKED	APPROVED
L.BAYNHAM	L.BAYNHAM	S.O'ROURKE	S.O'ROURKE

PROJECT
NARROMINE SHIRE COUNCIL, HW17 - NEWELL HIGHWAY DEVIATION
56.3km TO 64.1km NORTH OF PARKES

DRAWING TITLE
PROPERTY PLAN - SHEET 4 OF 4

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

constructive solutions
providing total solutions

50% CONCEPT DESIGN

TfNWS REGISTRATION No.	SIZE
TBC	A1
DRAWING NUMBER	REV
PW-104	1

Constructive Solutions Pty Ltd

www.constructivesolutions.com.au

Tamworth Office:

PO Box 1498

Tamworth NSW 2340

Phone: 02 6762 1969

Email: admin@constructivesolutions.com.au

Brisbane Office

PO Box 133

Paddington QLD 4064

Phone: 0427 011 143

Email: admin@constructivesolutions.com.au