sunrise
energy metals

Sunrise Project

Project Execution Plan Modification

Submissions Report

EXECUTIVE SUMMARY

The Sunrise Project (the Project) is a nickel, cobalt and scandium open cut mining project situated near the village of Fifield, approximately 350 kilometres west-northwest of Sydney, in New South Wales (NSW). SRL Ops Pty Ltd owns the rights to develop the Project. SRL Ops Pty Ltd is a wholly owned subsidiary of Sunrise Energy Metals Limited (SEM)[1].

Development Consent (DA 374-11-00) for the Project was issued under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) in 2001.

In June 2021, SEM submitted a Modification Report to support a request to modify Development Consent (DA 374-11-00) under section 4.55(2) of the EP&A Act to seek approval for the Project Execution Plan Modification (the Modification).

The Modification Report was placed on public exhibition by the Department of Planning, Industry and Environment from 27 July 2021 to 9 August 2021. During and following the public exhibition period, a total of eight submissions on the Modification Report were received from NSW Government agencies and submissions were also received from the Lachlan Shire Council and the Parkes Shire Council. Of these ten submissions, one supported the Modification and the remaining provided comment.

No submissions on the Modification Report were received from non-government organisations or members of the public.

On 12 August 2021, the Department of Planning, Industry and Environment requested that SEM prepare and submit a Submissions Report for the Modification (this report). Accordingly, this Submissions Report provides SEM's responses to issues raised in submissions on the Modification.

The majority of submissions raised environmental matters, including air quality; noise; biodiversity; transport; social; Aboriginal heritage; water resources and hazard and risks.

In support of this Submissions Report, SEM has commissioned additional technical specialist advice to assist in responding to some NSW Government agency submissions. None of the additional advice or assessment clarification has materially altered the findings of any key environmental assessment matters.

No amendments to the Modification have been required to address the submissions received. SEM has however volunteered some incidental additional management measures to address specific concerns raised.

Since lodgement of the Modification Report, SEM has reviewed the submissions on the Modification and has continued to consult with members of the community, local councils and NSW Government agencies, and also sought additional advice from its technical specialists. Based on this further consideration and analysis, SEM has concluded that the key potential impacts and benefits of the Modification and the justification for the Modification remain consistent with the conclusions presented in Section 7 of the Modification Report.

In weighing up the main environmental impacts (costs and benefits) associated with the proposal as assessed and described in the Modification Report and this Submissions Report, the Modification remains, on balance, in the public interest of the State of NSW.

[1] SEM was previously Clean TeQ Holdings Limited.

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1 INTRODUCTION

The Sunrise Project (the Project) is a nickel, cobalt and scandium open cut mining project situated near the village of Fifield, approximately 350 kilometres (km) west-northwest of Sydney, in New South Wales (NSW) (Figure 1).

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In June 2021, SEM submitted a Modification Report (SEM, 2021) to support a request to modify Development Consent (DA 374-11-00) under section 4.55(2) of the EP&A Act to seek approval for the Project Execution Plan Modification (the Modification).

The Modification Report was placed on public exhibition by the Department of Planning, Industry and Environment (DPIE) from 27 July 2021 to 9 August 2021. During and following the public exhibition period, submissions on the Modification were received from NSW Government agencies and relevant local councils.

On 12 August 2021, DPIE requested that SEM prepare and submit a Submissions Report for the Modification (this report). Accordingly, this Submissions Report provides SEM's responses to issues raised in submissions on the Modification. It has been prepared in consideration of the *State significant development guidelines – preparing a submissions report* (DPIE, 2021a).

The remainder of this Submissions Report is structured as follows:

Section 1 Provides an introduction and overview of the approved and modified Project.

Section 2 Provides an analysis of the submissions received by DPIE during the public exhibition period.

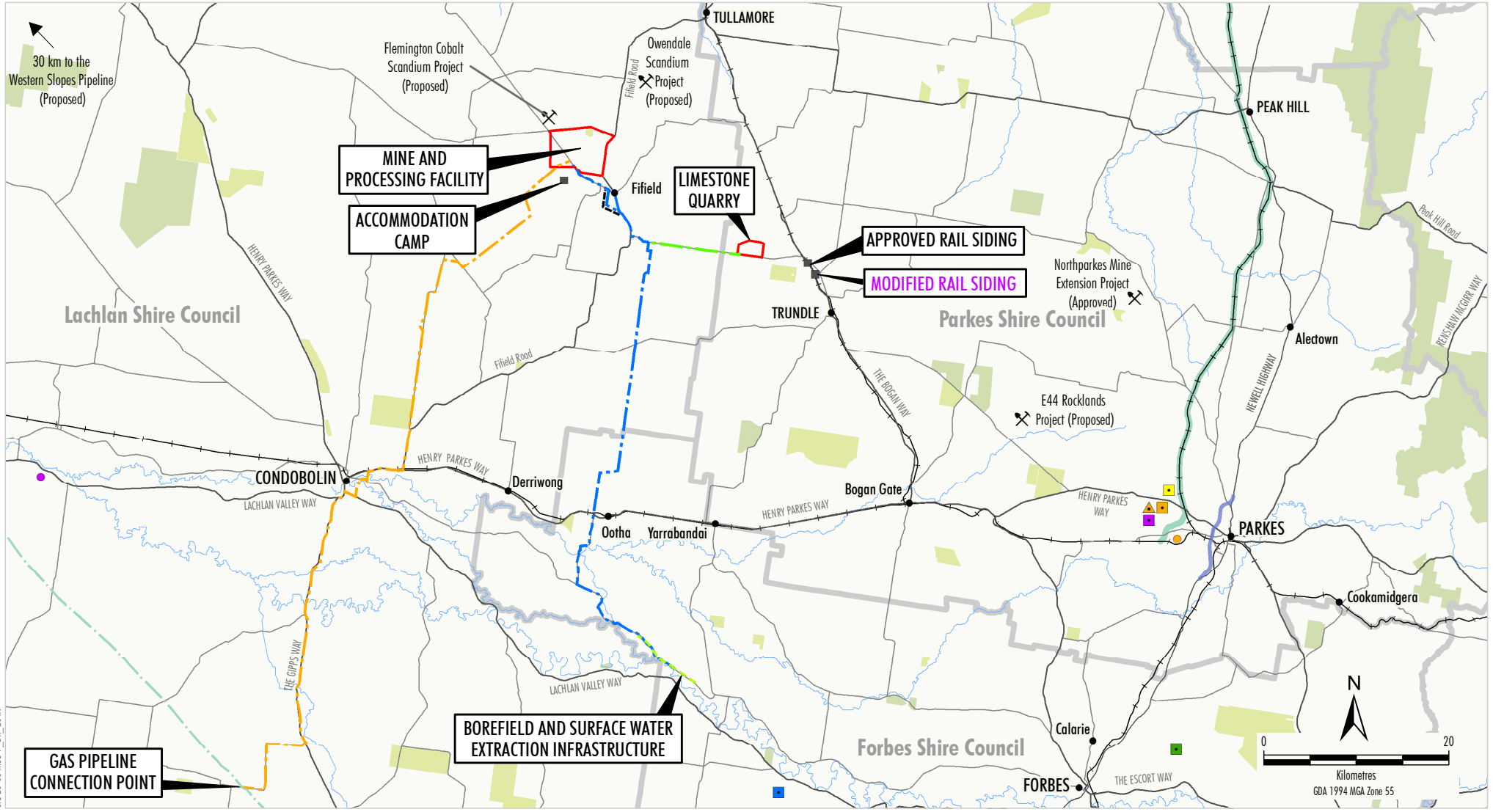
Section 3 Summarises the actions taken since lodgement of the Modification Report, including additional engagement activities and further refinements and assessment of the Modification.

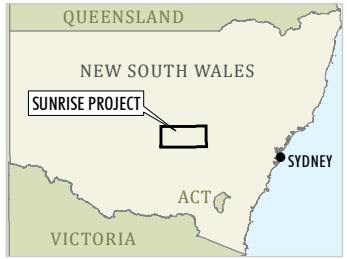
Section 4 Provides responses to aspects raised in submissions.

Section 5 Provides an updated evaluation of the Modification.

Section 6 Lists the documents referenced in the Submissions Report.

[2] SEM was previously Clean TeQ Holdings Limited (Clean TeQ).





LEGEND

- National Park/Conservation Area
- State Forest
- Local Government Boundary
- Railway
- Existing Gas Pipeline

Project Components

- Mining Lease Boundary (ML)
- Fifield Bypass
- Gas Pipeline
- Water Pipeline
- Limestone Quarry Water Pipeline
- Borefield Infrastructure Corridor

Other Relevant Projects

- Parkes Bypass (Approved)

Other State Significant Projects

- Mine Site
- Daroobalgie Solar Farm (Proposed)
- Goonumbla Solar Farm (Approved)
- Jemalong Solar Farm (Approved)
- Parkes Solar Farm (Approved)
- Quorn Park Solar Farm (Approved)
- Parkes Peaking Power Plant (Approved)
- Cattle Feedlot and Quarry (Approved)
- Parkes Special Activation Precinct
- Inland Rail (Parkes to Narromine) (Approved)

Source: Black Range Minerals (2000); Clean TeQ (2017, 2018, 2020); NSW Spatial Services (2020)

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SUNRISE PROJECT

Regional Location

Figure 1

1.1 PROJECT OVERVIEW

The Project includes the establishment and operation of the following:

- mine and processing facility;
- limestone quarry;
- rail siding;
- borefield, surface water extraction infrastructure and water pipeline;
- gas pipeline;
- accommodation camp; and
- associated transport activities and transport infrastructure (e.g. the Fifield Bypass, road and intersection upgrades).

The Project is currently approved to:

- undertake mining operations for 21 years from the day upon which mining operations start;
- operate a maximum autoclave feed rate of 2.5 million tonnes (Mt) of ore (dry weight) in any calendar year;
- transport in any one calendar year no more than 40,000 tonnes (t) of nickel and cobalt metal equivalents, 180 t of scandium oxide and 100,000 t of ammonium sulphate;
- extract up to 790,000 t of limestone from the limestone quarry in any one calendar year; and
- operate related supporting infrastructure.

Construction of the Project commenced in 2006, which included components of the borefield, however construction of other Project components is yet to commence.

1.2 MODIFICATION OVERVIEW

SEM has continued to review and optimise the Project design, construction and operation as part of preparations for Project execution. The outcomes of this review are outlined in the Project Execution Plan (Clean TeQ, 2020).

The Project Execution Plan identified a number of changes to the approved mine and processing facility, accommodation camp, rail siding and road transport activities. The Modification includes these Project Execution Plan changes to allow for the optimisation of the construction and operation of the Project.

Table 1 provides a comparative summary of the existing/approved and modified Project. In addition, Figure 2 shows the approved and modified mine and processing facility and accommodation camp, and Figure 3 shows the approved and modified rail siding.

Based on a review of the proposed changes, SEM considers that the modified Project would be substantially the same as the existing/approved Project.

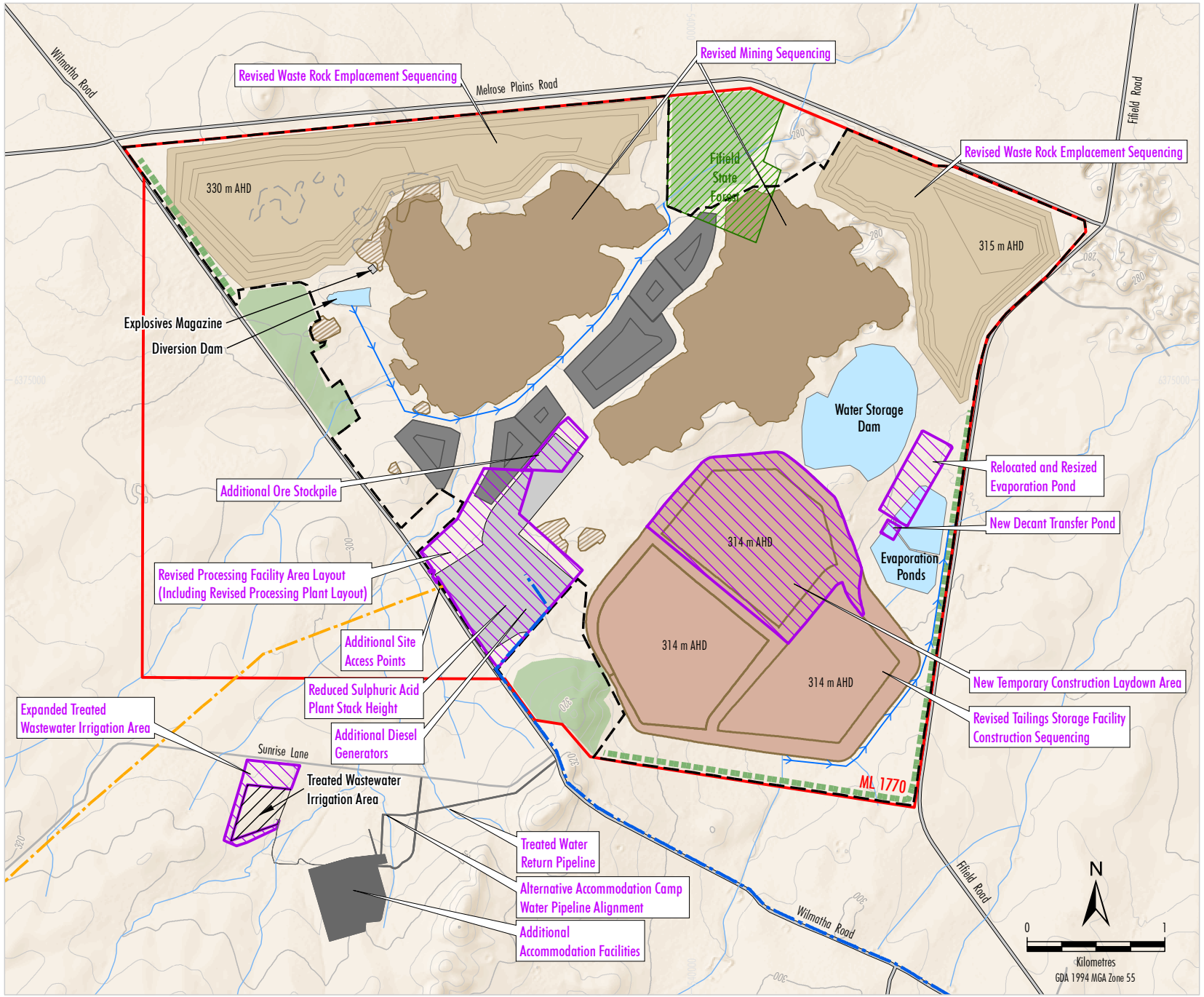
A detailed description of the Modification is provided in Section 3 of the Modification Report.

Table 1
Comparison of the Existing/Approved and Modified Project

Project Component	Existing/Approved	Modified
Mining Tenements	• Mining Lease (ML) 1770 and ML 1769.	• No change.
Project Life	• Construction phase – two years. • Operational phase – 21 years from the commencement of mining.	• Increased construction phase duration from two to three years. • No change to the operational phase.
Hours of Operation	• 24 hours per day, seven days per week.	• No change.
Mining Method	• Conventional open cut mining methods.	• No change to mining method. • Increased mining rate during initial years.
Open Cut Pit Extents	• Progressive development of two main open cut pits and multiple small-scale scandium open cut pits.	• No change to open cut pit extents. • Minor changes to the mining sequence.
Waste Rock Management	• Waste rock deposited in small-scale scandium open cut voids and in waste rock emplacements.	• No change to waste rock management. • Minor changes to the waste rock emplacement sequence.
Processing Facility Area	• Key components include processing plant, sulphuric acid plant, limestone slurry plant, process reagent storages, power plant, workshops, warehouses, offices, fuel storages, water treatment plants, run-of-mine (ROM) pad, laydown areas and vehicle access points.	• No change to key components. • Revised processing facility area layout (including revised processing plant layout and two additional vehicle site access points).
Processing Plant	• Metals extracted from the ore using an acid leach circuit and a resin-in-pulp circuit/metals recovery. • Autoclave feed rate of up to 2.5 Mt of ore (dry weight) in any calendar year.	• No change.
Processing Plant Reagents	• Up to 1,050,000 tonnes per annum (tpa) of sulphuric acid produced in the sulphuric acid plant.	• No change to sulphuric acid plant process or production rate. • Reduced sulphuric acid plant stack height from 80 metres (m) to 40 m.
	• Up to 990,000 tpa of limestone delivered to the mine and processing facility via road from either – the limestone quarry (up to 790,000 tpa); and/or – third-party suppliers (up to 560,000 tpa).	• No change.
	• Other processing plant reagents delivered to the mine and processing facility via road and rail.	• Revisions to processing plant reagent types, rates and storage volumes.
Products	• Up to 40,000 tpa of nickel and cobalt metal equivalents, as sulphate precipitate products. • Up to 100,000 tpa of ammonium sulphate. • Up to 180 tpa of scandium oxide.	• No change.
Tailings Management	• Tailings deposited in the tailings storage facility.	• No change to tailings management. • Revised tailings storage facility cell construction sequence. • Addition of a decant transfer pond.
Water Supply	• Development of borefield, surface water extraction infrastructure and water pipeline to the mine and processing facility.	• No change.

Table 1 (Continued)
Comparison of the Existing/Approved and Modified Project

Project Component	Existing/Approved	Modified
Water Management	• Overall objective is to control runoff from the construction and operational areas while diverting up-catchment water around these areas.	• No change to the overall water management objective. • Relocated and resized evaporation pond. • Changes to the water management system to reflect the modified mine and processing facility layout.
Power Supply	• Co-generation power plant (40 megawatts [MW]). • Diesel-powered backup generator.	• No change to co-generation power plant. • Increased number of diesel-powered backup generators (and associated stacks) from one large unit to four smaller units.
Exploration Activities	• No exploration activities.	• Addition of exploration activities within the approved surface development area inside ML 1770.
Accommodation Camp	• Development of an accommodation camp on the Sunrise property. • Approximate capacity of 1,300 personnel during the construction phase. • Reduced capacity of 300 personnel during the operations phase.	• Increased construction phase capacity from 1,300 to 1,900 personnel. • Increased size of the treated wastewater irrigation area. • Option for an alternative alignment of the last section of the accommodation camp water pipeline along the accommodation camp services corridor rather than along the access road corridor. • Option to transfer treated wastewater to the mine and processing facility via a water pipeline. • No change to the operational phase capacity.
Rail Siding	• Development of a rail siding on the Bogan Gate Tottenham Railway.	• Rail siding relocated approximately 500 m south of the approved location on the Bogan Gate Tottenham Railway. • Addition of an ammonium sulphate storage and distribution facility. • Addition of a 22 kilovolt (kV) electricity transmission line (ETL) (subject to separate approval). • No other changes to rail siding operations.
Gas Pipeline	• Development of a gas pipeline from the Moomba Sydney Pipeline to the mine and processing facility.	• No change.
Material Transport	• Transport of reagents and products via a combination of road and rail.	• Changes to construction phase vehicle movements associated with the increased construction phase accommodation camp capacity and changes to heavy vehicle delivery requirements. • Changes to operational phase heavy vehicle movements associated with revisions to processing plant reagent types, rates and storage volumes. • Changes to operational phase heavy vehicle movements to and from the rail siding associated with the transport of metal and ammonium sulphate products.
Road and Intersection Upgrades	• Road and intersection upgrades in accordance with the Development Consent (DA 374-11-00) and Voluntary Planning Agreement (VPA).	• Two additional mine and processing facility vehicle access point intersections on Wilmatha Road. • Extension to the Scotson Lane road upgrade. • No change to other road and intersection upgrades.
Workforce	• Peak of approximately 1,000 personnel during construction phase. • Approximately 335 personnel during operation phase.	• Increased peak construction phase workforce from approximately 1,000 up to a maximum of 1,900 personnel. • Increased operational phase workforce from approximately 335 to 340 personnel.



LEGEND

- State Forest

Approved Project

- Mining Lease Boundary (ML)
- Approved Surface Development Area
- Processing Facility
- Tailings Storage Facility
- Open Cut Pit (Scandium Oxide)
- Backfilled Open Cut Pit (Scandium Oxide)
- Open Cut Pit
- Waste Rock Emplacement
- Ore Stockpile
- Accommodation Camp
- Water Storage
- Diversion Structure
- Vegetation Screening
- Existing Open Woodland to be Maintained
- Gas Pipeline
- Water Pipeline

Modified Project

- Modified Layout

Source: Black Range Minerals (2000); Clean TeQ (2017, 2018, 2020); NSW Spatial Services (2020)

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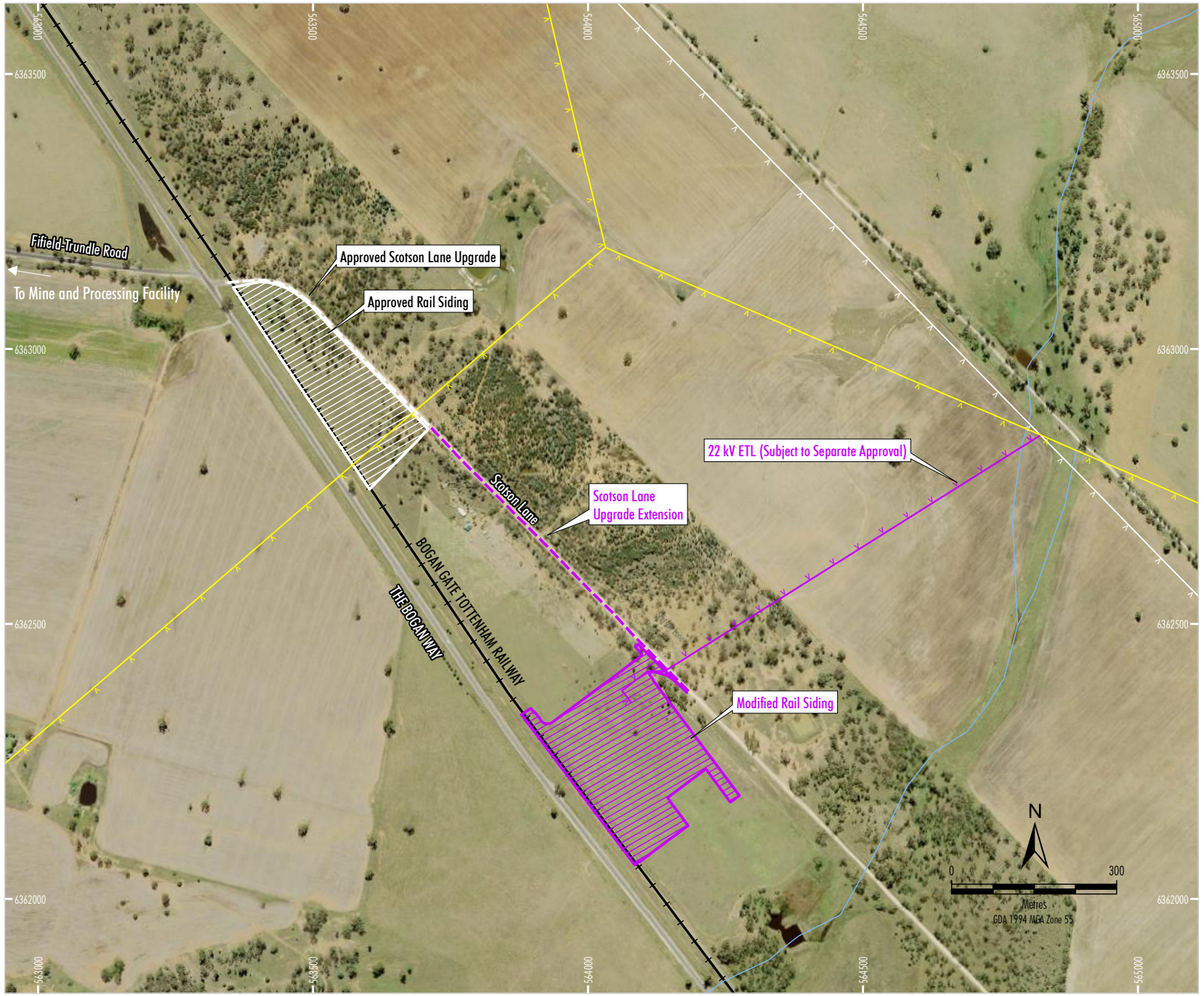
SUNRISE PROJECT

Approved and Modified Mine and Processing Facility Conceptual General Arrangement

Figure 2

CTL-20-08 MOD 7_SR_205A



LEGEND

- Railway
- Existing 11 kV Electricity Transmission Line
- Existing 22 kV Electricity Transmission Line
- Drainage Feature

Approved Project

- Surface Development Area
- Scotson Lane Upgrade

Modified Project

- Surface Development Area
- Scotson Lane Upgrade Extension
- 22 kV Electricity Transmission Line (Subject to Separate Approval)

Source: Black Range Minerals (2000); Clean Teq (2020, 2021); NSW Spatial Services (2020, 2021).

Orthophoto: © NSW Department of Finance, Services & Innovation (2021)

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SUNRISE PROJECT

Approved and Modified Rail Siding Location

Figure 3

CTL-20-08 MOD 7_SR_206A

2 ANALYSIS OF SUBMISSIONS

2.1 BREAKDOWN OF SUBMISSIONS

A total of eight submissions on the Modification Report were received from NSW Government agencies and submissions were also received from the Lachlan Shire Council (LSC) and the Parkes Shire Council (PSC).

The following agencies had little or no comment on the Modification, and hence no formal response from SEM is required:

- DPIE-Crown Lands (commenting submission);
- Department of Regional NSW – Mining, Exploration & Geoscience (commenting submission); and
- Department of Regional NSW – Resources Regulator (commenting submission).

The following agencies made a small number of comments on the Modification, or recommended post-approval management requirements:

- Transport for NSW (TfNSW) (commenting submission);
- DPIE-Water (commenting submission); and
- Heritage NSW (supporting submission).

The following agencies and local councils requested some additional information, or had more comprehensive comments/concerns regarding the Modification:

- LSC (commenting submission);
- PSC (commenting submission);
- Environment Protection Authority (EPA) (commenting submission); and
- DPIE – Biodiversity and Conservation and Science Directorate (BCS) (commenting submission).

No submissions on the Modification Report were received from non-government organisations or members of the public.

A register of submitters is provided in Attachment 1.

The key aspects raised in submissions are summarised in Section 2.2.

2.2 CATEGORISING ISSUES

Consistent with the *State significant development guidelines – preparing a submissions report* (DPIE, 2021a), SEM has reviewed the issues raised in submissions to categorise them into broad categories (e.g. submissions relating to the modified Project layout, design or activities; submissions relating to procedural matters; environmental matters). Based on this review, SEM considered that all of the issues raised were environmental matters, including:

- air quality;
- noise;
- biodiversity;
- transport;
- social;
- Aboriginal heritage;
- water resources; and
- hazard and risks.

3 ACTIONS TAKEN SINCE EXHIBITION

3.1 REFINEMENT OF THE PROJECT

No refinements of the Modification have been required to address the submissions received.

3.2 ENGAGEMENT ACTIVITIES

Since the lodgement of the Modification application, SEM has continued to consult with key NSW Government agencies, local councils and the community regarding the Project and the Modification.

An overview of key recent consultation is provided below.

DPIE – Biodiversity and Conservation Division

SEM met with the BCS to discuss its submission on biodiversity matters on 7 September 2021.

BCS agreed that an assessment of the potential impacts on biodiversity values associated with the alternative accommodation camp water pipeline alignment and expanded treated wastewater irrigation area components of the modified accommodation camp be undertaken.

BCS separately suggested in an email dated 20 September 2021 that SEM assess whether the expanded treated wastewater irrigation area component of the modified accommodation camp would be located on Category 1 – Exempt Land as defined in the NSW *Local Land Services Act 2013* noting the *Biodiversity Assessment Method* (DPIE, 2020a) under the NSW *Biodiversity Act 2016* does not apply to Category 1 – Exempt Land.

It is anticipated that consultation with the BCS will be ongoing throughout the NSW Government's assessment of the Modification.

Transport for New South Wales

SEM contacted the TfNSW on 24 September 2021 to discuss the proposed responses to the matters raised in the TfNSW submission. This included the updates required to the Traffic Management Plan and Road Transport Protocol, a rail level crossing safety assessment and matters raised by John Holland as the Rail Infrastructure Manager.

TfNSW raised no specific concerns regarding SEM's proposed responses and indicated that it would review the responses contained in the Submissions Report and request any further clarifications, if required.

Parkes Shire Council

SEM met with the PSC to discuss the transport matters (including road upgrade and maintenance contributions) and hazard-related matters raised in the PSC submission on 1 September 2021.

Subject to all key regular heavy vehicle deliveries to the Project site from the Parkes area (e.g. construction materials, processing plant inputs) approach the site via Henry Parkes Way and The Bogan Way rather than Middle Trundle Road, the PSC indicated that it is satisfied that the road upgrade and maintenance contributions outlined in the existing VPA are suitable for the modified Project. The PSC also indicated that its other transport concerns had been addressed.

The PSC requested in its submission that specific hazard-related mitigation measures outlined in the Preliminary Hazard Analysis (Pinnacle Risk Management, 2021) be included as conditions in any modified Development Consent. SEM explained during the meeting that no specific hazard-related mitigation measures at the rail siding were proposed in the Preliminary Hazard Analysis. The PSC separately indicated that it supports the recommendations of the Preliminary Hazard Analysis (i.e. no specific mitigation measures are required) in an email dated 14 September 2021.

Lachlan Shire Council

SEM met with the LSC to discuss the social and transport matters (including community infrastructure and road upgrade and maintenance contributions) raised in the LSC submission on 6 September 2021.

The LSC requested that the recently proposed Moomba to Wilton Pipeline Modification 1 and the Mineral Hill Gold Mine be considered in the Submissions Report.

The LSC separately indicated that it is satisfied that the road upgrade and maintenance contributions outlined in the existing VPA are suitable for the modified Project in an email dated 22 September 2021.

The LSC acknowledged that it would receive an additional community contribution payment ($200,000 per year [indexed]) under the existing VPA as a result of the Modification and that it would review SEM's responses to the social matters contained in the Submissions Report and request any further clarifications, if required.

SEM anticipates that consultation with the LSC will be ongoing throughout the NSW Government's assessment of the Modification.

Community Consultative Committee

An update on the Modification was provided at an extraordinary Community Consultative Committee meeting held on 27 July 2021. SEM provided a recap of the Modification, an overview of the outcomes of the Modification Report, an overview of the Modification assessment process (including the public exhibition process) and an opportunity for Community Consultative Committee members to ask questions in relation to the Modification.

3.3 FURTHER ENVIRONMENTAL ASSESSMENT

In support of this Submissions Report, SEM has commissioned the following additional technical specialist advice to assist in responding to some NSW Government agency submissions:

- Jacobs Group (Australia) Pty Ltd – response to air quality matters raised by the EPA (Attachment 2).
- Renzo Tonin & Associates (Renzo Tonin) – response to noise matters raised by the EPA (Attachment 3).

Consistent with the outcomes of consultation with the BCS (Section 3.2), SEM has separately appended additional information in relation to potential biodiversity impacts and assessment for the modified accommodation camp (Attachment 4).

In addition, consideration of the potential cumulative social impacts associated with the modified Project and the recently proposed Moomba to Wilton Pipeline Modification 1 and the Mineral Hill Gold Mine is provided in Section 4.5 as discussed with the LSC (Section 3.2).

None of the additional advice or assessment clarification has materially altered the findings of any key environmental assessment matters.

Notwithstanding, SEM has volunteered some incidental additional management measures to address specific concerns raised, as follows:

- SEM has confirmed that it would limit the in-stack concentration of the sulphuric acid stack to 60 milligrams per cubic normal metre (mg/Nm^3).
- SEM has confirmed it would be agreeable to a new consent condition requiring the road safety audits required by existing Conditions 43 and 44, Schedule 3 of Development Consent (DA 374-11-00) to include rail level crossing safety assessments, including consideration of Australian Standard (AS) 1742.7 *Manual of uniform traffic control devices, Part 7: Railway crossings* and Establishing a Railway Crossing Safety Management Plan (NSW Roads & Traffic Authority, 2011).
- SEM has confirmed it would be agreeable to existing Conditions 38 and 40(b), Schedule 3 of Development Consent (DA 374-11-00) being revised to replace “Condobolin Local Aboriginal Land Council” with “Registered Aboriginal Parties”.

4 RESPONSE TO SUBMISSIONS

The matters raised in the submissions were related to the environmental and social impacts associated with the modified Project (Section 2.2). Responses to these issues are provided below.

4.1 AIR QUALITY

Sulphuric Acid Emissions

Issue

The EPA requested that SEM demonstrate that compliance with the EPA impact assessment criterion for sulphuric acid can be achieved at the site boundary. The EPA recommended that consideration should be given to the assessment of potential impacts based on plant specific emission performance of sulphuric acid emissions.

Response

The potential impacts of sulphuric acid mist in the Modification Air Quality Assessment (Jacobs, 2021) were determined by conservatively modelling the acid plant in-stack concentrations at the limit for scheduled premises under the *Protection of the Environment Operations (Clean Air) Regulation 2010* (POEO Regulation) (i.e. 100 mg/Nm^3) rather than the current design specifications (i.e. 60 mg/Nm^3) (Attachment 2).

Jacobs has remodelled the sulphuric acid in-stack concentration at the current design specification (i.e. 60 mg/Nm^3) and the predicted sulphuric acid concentrations would comply with the relevant EPA impact assessment criterion at the site boundary (Attachment 2).

Assessment of the Amended Ambient Air Quality NEPM Standards

Issue

The EPA recommended an assessment of impacts for the processing facility (including the proposed diesel generators) against the recently amended *National Environment Protection (Ambient Air Quality) Measure* (Ambient Air Quality NEPM).

Response

The Modification Air Quality Assessment (Jacobs, 2021) was prepared in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (EPA, 2017a) (the Approved Methods). The Approved Methods do not refer to the Ambient Air Quality NEPM. In addition, it is understood that the Modification is not required to be assessed against the Ambient Air Quality NEPM as the purpose of the Ambient Air Quality NEPM is to provide “a national framework for monitoring and reporting on exposure to common ambient air pollutants”, and is not intended for the assessment of individual projects (Attachment 2).

Notwithstanding, an assessment of the Modification against the recently amended Ambient Air Quality NEPM has been undertaken and is provided in Attachment 2. This assessment indicated that the Modification would comply with the amended Ambient Air Quality NEPM at all sensitive receivers, including for cumulative operation of the processing facility, blasting and diesel exhaust emissions at the mine and processing facility (Attachment 2).

Assessment of Volatile Organic Compounds (VOCs)

Issue

The EPA requested further detail on the methodology for assessing speciated Volatile Organic Compounds (VOCs), including any data sources referenced for estimating VOCs emissions.

Response

Consistent with the Modification 4 Air Quality and Greenhouse Gas Assessment (Ramboll, 2017), concentrations of VOCs were based on *Speciation Profiles and Toxic Emission Factors for Nonroad Engines* (United States Environmental Protection Agency, 2015), which stipulated the following estimates for benzene and 1,3-butadiene:

- Benzene – 7.7% of total VOCs.
- 1,3-butadiene – 7% of total VOCs.

This estimate of benzene and 1,3-butadiene emissions is more conservative than the National Pollutant Inventory (NPI) (NPI, 2008) emission factors for diesel engines which outlines that these are less than 1% of total VOCs (Attachment 2).

Issue

The EPA requested SEM demonstrate that the assessment methodology for volatile organic compounds is representative of reasonable worst-case emissions and potential impacts.

Response

The assessment of VOCs is considered representative of 'maximum case' emissions as (Attachment 2):

- the estimated concentrations were conservatively modelled at the in-stack concentration limits for schedule premises under the POEO Regulation; and
- emissions were conservatively modelled to be released continuously from all sources 24 hours per day, every day of the year.

4.2 NOISE

Environment Protection Licence 21146 Construction Noise Limits

Issue

The EPA requested a comparison of the predicted construction noise levels against the limits in EPL 21146.

Response

A comparison of the Environment Protection Licence (EPL) 21146 construction noise limits against the predicted noise levels in the Noise Assessment (Renzo Tonin, 2021) is provided in Attachment 3.

In summary, the predicted construction noise levels at the modified mine and processing facility are below the EPL 21146 noise limits for the day, evening and night periods (Attachment 3).

As described in Section 3.3.4 of the Modification Report (SEM, 2021), construction of the modified rail siding would be undertaken between 7:00 am and 6:00 pm, seven days per week (i.e. during the daytime period). The predicted construction noise levels at the modified rail siding are below the EPL 21146 noise limits for the relevant daytime period (Attachment 3).

Assessment of Modifying Correction Factors

Issue

The EPA requested calculations and information to support the assessment of modifying factors in accordance with NPfI Fact Sheet C.

Response

Section 8.2 of the Noise Assessment (Renzo Tonin, 2021) concluded that:

> *Modifying factor adjustments, as per Fact Sheet C of the NPfI, has been considered for all proposed plant and equipment. Based on Renzo Tonin & Associates' experience, noise from all proposed plant and equipment, individually and in combination were determined not to exhibit tonal, low-frequency, impulsive, and/or intermittent characteristics. Therefore, no modifying factors corrections are required.*

Renzo Tonin has prepared a detailed low frequency noise assessment of the Modification, which includes calculations and noise curves for the assessed receiver locations (Attachment 3).

The low frequency curves show that no privately-owned receiver is expected to experience dominant low frequency noise and therefore no modifying factor corrections are required consistent with the conclusions of the Noise Assessment (Attachment 3).

Modelled Sound Power Levels

Issue

The EPA requested clarification of any differences in sound power levels used in the Noise Assessment compared to Modification 4 Noise Assessment and the details of the adopted sound power levels (including references and attenuation packages adopted).

Response

As construction of the Project (with the exception of components of the borefield in 2006) has not commenced, there is no ability to conduct attended on site noise measurements of the specified plant items. Furthermore, as it is a new project, SEM would utilise 'best practice' fleet for the Project.

Given the above, 'best practice' sound power levels for each of the proposed fleet items for the modified Project were selected from similar projects as well as Renzo Tonin's internal database. The updated sound power levels (compared to the Modification 4 Noise Assessment [Renzo Tonin, 2017]) used in the Noise Assessment (Renzo Tonin, 2021) are considered to be representative of the 'best practice' fleet to be adopted at the modified Project and therefore there was limited opportunities to reduce noise levels further through attenuation.

A summary of sound power level references and any noise attenuation packages for the modelled fleet are provided in Attachment 3.

Changes in Predicted Noise Levels Compared to Modification 4

Issue

The EPA requested an explanation for the change in the predicted operational noise levels relative to Modification 4 Noise Assessment.

Response

Relative to the Modification 4 Noise Assessment (Renzo Tonin, 2017), the predicted operational noise levels for the Modification have changed because of (Attachment 3):

1. Project changes proposed as part of the Modification, including (Section 2.1 of the Modification Noise Assessment [Renzo Tonin, 2021]):
    a. optimised production schedule resulting in an increased mining rate during the initial years of mining and associated changes to mining and waste rock emplacement sequencing; and
    b. revised tailings storage facility cell construction sequence.
2. Changes to the assessable meteorological conditions due to:
    a. Changes to the adopted meteorological data (the Modification Noise Assessment adopted site-specific meteorological data which were not available for the Modification 4 Noise Assessment); and
    b. Updated NSW Government noise assessment policy.

Notwithstanding the project changes, the change in predicted operational noise levels associated with the Modification is mainly attributed to the changes in assessable meteorological conditions. It is noted that the Modification Noise Assessment was undertaken in accordance with *Noise Policy for Industry* (EPA, 2017b) (NPfI) whilst the Modification 4 Noise Assessment (Renzo Tonin, 2017) was undertaken in accordance with the NSW *Industrial Noise Policy* (EPA, 2000), which has since been superseded by the NPfI.

A comparison of the assessed meteorological conditions for the Modification 4 and the Modification Noise Assessment is provided in Table 2. Further justification regarding the modelled meteorological conditions is provided in Attachment 3.

Table 2
Comparison of Modification 4 and the Modification Meteorological Assessment Conditions

Period	Meteorological Condition Type	Windspeed (Default)	Wind Direction	Inversion
Modification 4 Noise Assessment				
Day	Standard Conditions	Calm	-	-
Evening	Standard Conditions	Calm	-	-
Night	Standard Conditions	Calm	-	-
	Adverse Conditions	-	-	3°C / 100 m
Modification Noise Assessment				
Day	Standard Conditions	0.5 m/s	Source-receiver	-
Evening	Standard Conditions	0.5 m/s	Source-receiver	-
	Adverse Conditions	3 m/s	South	-
		3 m/s	South-southwest	-
		3 m/s	South-west	-
		3 m/s	West-southwest	-
Night	Standard Conditions	0.5 m/s	Source-receiver	-
	Adverse Conditions	-	-	4°C / 100 m

Source: Attachment 3.

Change in Assessed Mine Years Compared to Modification 4

Issue

The EPA requested justification regarding the changes in the assessed years relative to the Modification 4 Noise Assessment and clarify the difference in impacts for the scenarios assessed in previous modifications.

Response

The Modification includes changes to the operations at the mine and processing facility (refer to the previous response). A review of the modified operations was therefore conducted to identify the maximum case noise impact scenarios for the modified Project. Based on this review, Years 1, 10 and 17 were considered to be the maximum case noise impact scenarios for the modified Project and were therefore adopted in the Noise Assessment (Attachment 3).

It is noted that, although the indicative year of these scenarios is different to those adopted in the Modification 4 Noise Assessment (Renzo Tonin, 2017), the actual activities occurring in the scenarios are similar as they both represent maximum case noise impact scenarios (Attachment 3).

Reasonable and Feasible Mitigation Measures

Issue

The EPA requested clarification of the at source mitigation considered, rejected and implemented for the Modification and a justification that all reasonable and feasible mitigation has been considered.

Response

As described in the Noise Assessment (Renzo Tonin, 2021), where feasible and reasonable, mitigation measures have been introduced into the modified Project to reduce potential noise emissions, including:

- significant modifications to mine and processing facility operations during relevant adverse meteorological conditions in the evening period;
- adoption of a reduced evening/night time fleet with reduced ore and waste haul trucks to reduce noise levels; and
- adoption of ‘best practice’ sound power levels for the proposed fleet items.

The assessment of reasonable and feasible noise mitigation measures included a review of at source mitigation measures for the key noise generating fleet items (e.g. attenuating fleet items and the construction of acoustic bunds) to reduce potential noise emissions. Details of this review are provided in Attachment 3.

The review concluded that, although attenuation of the waste rock haul trucks may be possible, the significant cost associated with attenuating seven haul trucks is not reasonable as receivers located to the north (e.g. Currajong Park 1 and 2) would continue to experience a moderate exceedance as defined under the *Voluntary Land Acquisition and Mitigation Policy* (NSW Government, 2018) (i.e. no change to the impact category).

Acoustics bunds to maximise shielding of key noise generating fleet items on the north-eastern waste emplacement and eastern open cut pit to appreciably reduce predicted noise levels at nearby receivers was also considered (Attachment 3). An acoustic bund is not considered reasonable or feasible to potentially shield receivers located to the north (e.g. Currajong Park 1 and 2) because:

- north-eastern waste emplacement:
  - the fleet items could only operate in close proximity (i.e. the only location where the acoustic bund would be effective) to the bund for a short period of time; and
  - the acoustic bund would result in limited noise mitigation under adverse meteorological (temperature inversion) conditions.
- eastern open cut pit:
  - a bund would only be temporarily effective before the north-eastern waste emplacement would act as an acoustic bund to receivers located north;
  - the acoustic bund would result in limited noise mitigation under adverse meteorological (temperature inversion) conditions; and
  - the acoustic bund would have to be significantly large to be potentially effective (i.e. greater than 1 km long, and 10 m high).

Therefore, due to the deficiencies and significant costs associated with these acoustic bunds, SEM does not consider the use of acoustics bunds to be reasonable and feasible.

Further details regarding the review of reasonable and feasible mitigation measures are provided in Attachment 3.

Acquisition Upon Request Rights

Issue

The LSC requested additional information regarding potential noise impacts on residences in the vicinity of the mine and processing facility and the application of voluntary acquisition rights under the Voluntary Land Acquisition and Mitigation Policy (NSW Government, 2018).

Response

SEM would implement reasonable and feasible noise mitigation measures at the mine and processing facility, including significantly modifying mining operations during adverse meteorological conditions (Section 6.3.2 of the Modification Report). With the implementation of these noise mitigation measures, no privately-owned sensitive receivers are predicted to experience significant exceedances and therefore acquisition upon request rights would not be required for the Modification in accordance with the *Voluntary Land Acquisition and Mitigation Policy* (NSW Government, 2018).

Notwithstanding the above, given the considerable operating costs associated with significantly modifying mining operations during adverse meteorological conditions, SEM may seek to enter into negotiated agreements with the owners of relevant privately-owned receivers in accordance with the *Voluntary Land Acquisition and Mitigation Policy* (NSW Government, 2018). In accordance with Condition 7, Schedule 3 of Development Consent (DA 374-11-00), if negotiated agreements were to be put in place with the owners of the relevant privately-owned sensitive receivers, or these sensitive receivers were to become SEM-owned, significant modifications to mining operations would not be considered reasonable, and modifications to mining operations would be less significant (e.g. ceasing operation of a small number of noisy equipment such as drills or avoiding the use of intermittently operating auxiliary equipment).

However, if negotiated agreements with the owners of the relevant privately-owned sensitive receivers are not achieved, or are only achieved for a subset of the relevant privately-owned sensitive receivers, SEM would implement all of the noise mitigation measures described in the Modification Report.

Owners of all of the privately-owned sensitive receivers that are predicted to experience exceedances of the relevant noise criteria have been provided with an overview of the conclusions of the Noise Assessment by SEM.

4.3 BIODIVERSITY

Alternative Water Pipeline Alignment

Issue

BCS requested additional information on the alternative water pipeline alignment and stated that impacts may need to be assessed through the preparation of a BDAR.

Response

The Modification would include the option for an alternative alignment of the last section of the accommodation camp water pipeline along the accommodation camp services corridor, rather than along the access road corridor. As the alternative alignment of the accommodation camp water pipeline would be wholly located within the approved surface development area, no additional native vegetation clearance would be required.

Attachment 4 includes an assessment of the impacts of the alternative alignment of the accommodation camp water pipeline on biodiversity values, which concluded that there would be no loss in biodiversity values associated with the alternative water pipeline alignment. Therefore, with reference to clause 30A, sections 1(a) and 2(c) of the NSW *Biodiversity Conservation (Savings and Transitional) Regulation 2017*, it is considered that a Biodiversity Development Assessment Report (BDAR) is not required.

Expanded Treated Wastewater Irrigation Area

Issue

BCS requested additional information on the expanded treated wastewater irrigation area and stated that impacts to native vegetation clearance may need to be assessed through the preparation of a BDAR.

Response

The Modification would include an expanded treated wastewater irrigation area. Consistent with the approved treated wastewater irrigation area, no native vegetation clearance would however be required for the expanded treated wastewater irrigation area.

Irrigation of the treated wastewater at the modified accommodation camp would be undertaken in accordance with the *Environmental Guidelines: Use of Effluent by Irrigation* (Department of Environment and Conservation [DEC], 2004). In consideration of the *Environmental Guidelines: Use of Effluent by Irrigation*, the following measures would be implemented at the modified accommodation camp (Attachment 4):

- The wastewater (effluent) would be treated to a high level with primary (solid/liquid separation and anerobic treatment), secondary (aerobic treatment) and tertiary (including nutrient reduction and disinfection) treatment so that the treated wastewater would be:
  - "low strength effluent" as defined in the *Environmental Guidelines: Use of Effluent by Irrigation* (DEC, 2004); and
  - suitable for agricultural use including for use on crops.
- The irrigation system design (including low impact sprinklers) would evenly distribute the treated wastewater so as not to:
  - cause irrigation water runoff from the irrigation area; or
  - exceed the capacity of the soil in the irrigation area to effectively absorb the applied nutrient, salt, organic material and hydraulic loads.
- Detailed operational procedures would be developed for the treated wastewater irrigation area (including irrigation rates, frequency and timing; monitoring and reporting) to effectively manage potential impacts associated with the modified treated wastewater irrigation area.

Attachment 4 includes an assessment of biodiversity values for the expanded treated wastewater irrigation area which concluded that the expanded treated wastewater irrigation area would not increase impacts on biodiversity values. Therefore, with reference to clause 30A, sections 1(a) and 2(c) of the NSW *Biodiversity Conservation (Savings and Transitional) Regulation 2017*, it is considered that a BDAR is not required for the expanded treated wastewater irrigation area.

Issue

BCS requested that SEM assess whether the expanded treated wastewater irrigation area would be located on Category 1 – Exempt Land as defined in the NSW *Local Land Services Act 2013*.

Response

On the basis that no BDAR is considered to be required for the expanded treated wastewater irrigation area (refer to previous response and Attachment 4 for details), consideration of whether the expanded irrigation area component of the modified accommodation camp would be located on Category 1 – Exempt Land as defined in the NSW *Local Land Services Act 2013* is not considered necessary.

4.4 TRANSPORT

Road Upgrades and Maintenance Contributions

Issue

PSC requested that SEM contribute to the upgrade and maintenance of key roads impacted by the modified Project.

Response

Conditions 43 and 44, Schedule 3 of Development Consent (DA 374-11-00) and the VPA outline SEM's existing road upgrade and maintenance obligations, including:

- undertaking significant road upgrades during the construction phase of the Project;
- making annual road maintenance contributions throughout the life of the Project;
- undertaking road safety audits prior to the commissioning of the Project and contributing to the rectification of road safety measures relevant to the Project; and
- making major repair contributions for exceptional road damage or failure.

Details of the approved road and intersection upgrades and maintenance are outlined in the *Road Upgrade and Maintenance Strategy* (Clean TeQ, 2019a).

In the Parkes Local Government Area, the Modification would include an extension of the Scotson Lane road upgrade to reflect the modified rail siding location (Section 3.3.8 of the Modification Report). SEM would pay for the upgrade of Scotson Lane (including the extension proposed as part of the Modification).

As described in Section 3.2, SEM met with the PSC on 1 September 2021 to discuss the issues raised in the PSC submission. The PSC agreed that SEM's existing road upgrade and maintenance obligations outlined in the VPA are sufficient for the modified Project.

Based on the above, SEM considers that no changes to its existing road upgrade and maintenance obligations outlined in the VPA are required for the Modification.

Design of The Bogan Way/Fifield Trundle Road and Scotson Lane Intersections

Issue

The PSC requested certain design requirements for The Bogan Way/Fifield Trundle Road and Scotson Lane intersections.

Response

Conditions 43 and 44, Schedule 3 of Development Consent (DA 374-11-00) and the VPA outline SEM's existing road upgrade and maintenance obligations, including the upgrade of The Bogan Way/Fifield Trundle Road and Scotson Lane intersections. The Modification would not change the requirement to upgrade these intersections.

Details of The Bogan Way/Fifield Trundle Road and Scotson Lane intersection upgrades are outlined in the *Road Upgrade and Maintenance Strategy* (Clean TeQ, 2019a) and "road construction program" in accordance with Conditions 43, Schedule 3 of Development Consent (DA 374-11-00) and the VPA, respectively.

SEM has provided the PSC with the latest designs for The Bogan Way/Fifield Trundle Road and Scotson Lane intersection upgrades. The approved *Road Upgrade and Maintenance Strategy* (Clean TeQ, 2019a) would be updated to incorporate the Modification in consultation with PSC in accordance with Condition 43, Schedule 3 of Development Consent (DA 374-11-00).

Heavy Vehicle Use of Middle Trundle Road

Issue

PSC indicated that its preference was for heavy vehicles to use Henry Parkes Way and The Bogan Way rather than Middle Trundle Road.

Response

The Modification proposes to move the majority of construction phase heavy vehicles from Middle Trundle Road to Henry Parkes Way and The Bogan Way which would reduce heavy vehicle movements on Middle Trundle Road from 102 trucks per day to 8 trucks per day. This reduction was proposed based on consultation with the PSC during the preparation of the Modification Report (Section 5.2.2 of the Modification Report).

The Modification would not change the approved operational phase heavy vehicle movements on Middle Trundle Road (i.e. 8 trucks per day).

As described in Section 3.2, SEM met with the PSC on 1 September 2021 to discuss the issues raised in the PSC submission. During this meeting, SEM highlighted the proposed reduction in construction phase heavy vehicle usage of Middle Trundle Road and explained that only heavy vehicles associated with irregular deliveries would use Middle Trundle Road. The PSC indicated that it was comfortable with the proposed use of Middle Trundle Road.

Rail Level Crossings

Issue

TfNSW requested that safety assessments for each of the railway level crossings along the Project transport route be carried out.

Response

The following railway level crossings are located along the key Project transport routes:

- Henry Parkes Way approximately 5 km west of Parkes on the Orange Broken Hill Railway (active level crossing);
- Fifield Road just to the north of its intersection with Henry Parkes Way on the Orange Broken Hill Railway (active level crossing);
- Henry Parkes Way in Bogan Gate on the Bogan Gate Tottenham Railway (Give Way signs on the approach from both directions);
- The Bogan Way in three locations between Bogan Gate and Trundle on the Bogan Gate Tottenham Railway (Give Way signs on the approach from both directions); and
- Scotson Lane near The Bogan Way on the Bogan Gate Tottenham Railway (Give Way signs on the approach from both directions).

TTPP (2021) concluded that the Modification would not have a perceptible impact on the operation of these railway level crossings as the Modification would not significantly increase Project-related vehicles at these railway level crossings and would not change the rail movements (i.e. an average of three trains per week, with a maximum of two trains per day) (Section 6.7 of the Road Transport Assessment).

Conditions 43 and 44, Schedule 3 of Development Consent (DA 374-11-00) require SEM to conduct road safety audits on key Project transport routes (including railway level crossings). As part of these road safety audits, SEM would conduct safety assessments, including consideration of AS 1742.7 and *Establishing a Railway Crossing Safety Management Plan* (NSW Roads & Traffic Authority, 2011), for the railway level crossings listed above.

SEM would be agreeable to a consent condition requiring the road safety audits required by existing Conditions 43 and 44, Schedule 3 of Development Consent (DA 374-11-00) to include rail level crossing safety assessments, including consideration of AS 1742.7 *Manual of uniform traffic control devices, Part 7: Railway crossings* and *Establishing a Railway Crossing Safety Management Plan* (NSW Roads & Traffic Authority, 2011).

Scotson Lane Rail Level Crossing Upgrade

Issue

The TfNSW submission included comments from John Holland (the Rail Infrastructure Manager) that indicated that the Scotson Lane railway level crossing would need to be upgraded to achieve compliance with AS 1742.7 Manual of uniform traffic control devices, Part 7: Railway crossings.

Response

As describe above, Conditions 43 and 44, Schedule 3 of Development Consent (DA 374-11-00) require SEM to conduct road safety audits on key Project transport routes (including railway level crossings). As part of these road safety audits, SEM would conduct a safety assessment of the Scotson Lane rail level crossing, including consideration of AS 1742.7 and *Establishing a Railway Crossing Safety Management Plan* (NSW Roads Traffic Authority, 2011).

SEM considers that any requirement to upgrade the Scotson Lane railway level crossing should be determined based on the outcomes of these rail level crossing safety assessments.

SEM would be agreeable to a consent condition requiring the road safety audits required by existing Conditions 43 and 44, Schedule 3 of Development Consent (DA 374-11-00) to include rail level crossing safety assessments, including consideration of AS 1742.7 *Manual of uniform traffic control devices, Part 7: Railway crossings* and *Establishing a Railway Crossing Safety Management Plan* (NSW Roads Traffic Authority, 2011).

The existing VPA includes funding arrangements for potential upgrades required as a result of the road safety audit.

Rail Siding Design and Secondary Approval Requirements

Issue

The TfNSW submission included comments from John Holland (the Rail Infrastructure Manager) that outlined various design and secondary approval requirements for the rail siding (particularly the loading siding).

Response

If SEM proceeds with the construction of the loading siding, the design and construction of the loading siding would be undertaken in accordance with the requirements of John Holland (or the relevant Rail Infrastructure Manager at the time).

SEM would consult with TfNSW and John Holland (or the relevant Rail Infrastructure Manager at the time) regarding relevant secondary approval requirements and obtain necessary secondary approvals for the rail siding.

Traffic Management Plan

Issue

TfNSW requested that the Traffic Management Plan (including the Road Transport Protocol) be updated to incorporate the Modification and include driver fatigue and behaviour management measures.

Response

In accordance with Condition 45, Schedule 3 of Development Consent (DA 374-11-00), a Traffic Management Plan (Clean TeQ, 2019b) has been developed for the Project and includes (amongst other things):

- measures that would be implemented to:
  - minimise traffic safety issues and disruption to local users of the transport route/s during construction and decommissioning of the development;
  - operate shuttle bus services to transport employees to and from Parkes, Forbes and Condobolin;
- a Road Transport Protocol for all drivers transporting materials to and from the site with measures to:
  - manage worker fatigue during trips to and from the site;
  - manage appropriate driver behaviour including adherence to speed limits, safe overtaking and maintaining appropriate distances between vehicles (i.e. a Driver Code of Conduct);
  - inform drivers of relevant drug and alcohol policies; and
  - ensure compliance with and enforcement of the protocol.

SEM would update the Traffic Management Plan to incorporate the Modification in consultation with TfNSW in accordance with Condition 45, Schedule 3 and Condition 6, Schedule 5 of Development Consent (DA 374-11-00).

NSW Roads Act 1993 Approvals

Issue

The PSC indicated that SEM would need to obtain approvals under the NSW *Roads Act 1993* for the proposed works within the road corridors.

Response

SEM acknowledges that consents under section 138 of the NSW *Roads Act 1993* would need to be obtained where required, in consultation with the relevant roads authority/authorities (e.g. PSC) for the modified Project.

Lachlan Shire Council Road Transport Comments

Issue

The LSC indicated that it supported the PSC's comments in relation to road transport.

Response

Responses to the road transport-related issues raised by the PSC are provided above.

The LSC separately indicated that it is satisfied that the road upgrade and maintenance contributions outlined in the existing VPA are suitable for the modified Project in an email dated 22 September 2021.

4.5 SOCIAL

Housing Availability Impacts

Issue

The LSC raised concerns regarding the potential incremental housing availability impacts during the initial construction phase of the modified Project.

Response

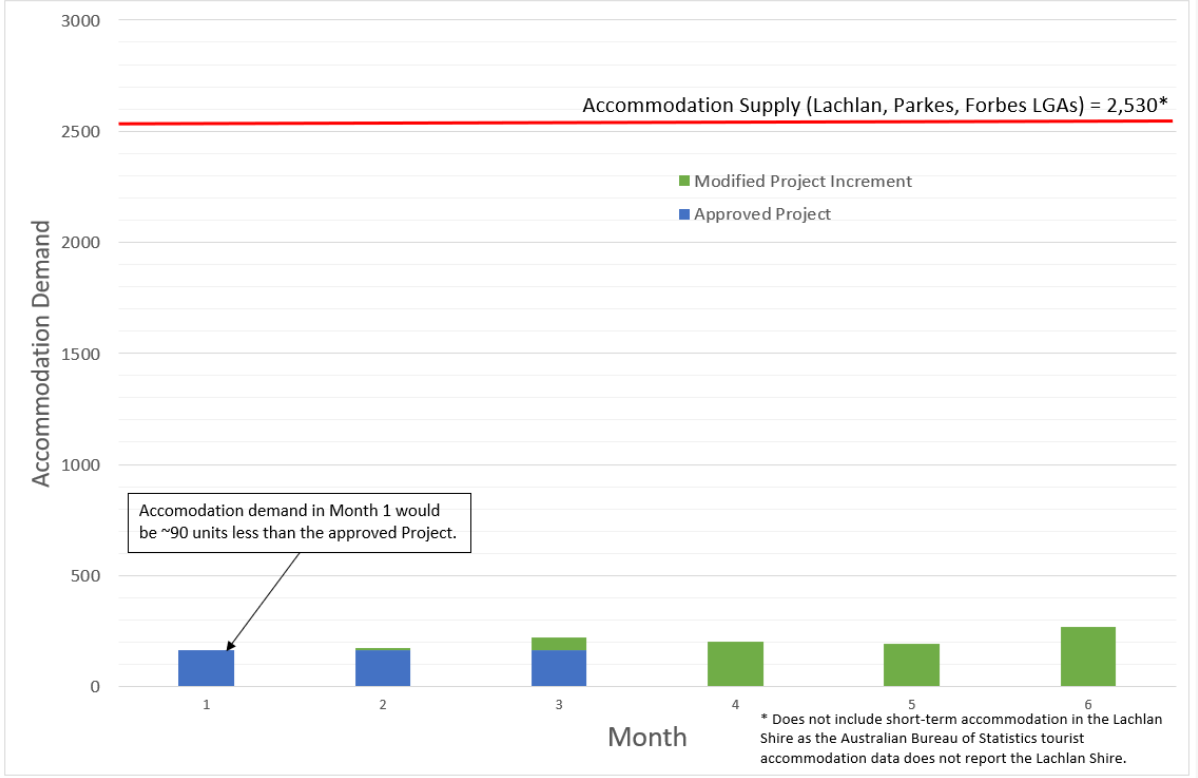
The majority of the Project construction workforce would be accommodated in the accommodation camp (once operational) which would minimise potential impacts on the local housing market.

The Modification would increase the duration of the period where the accommodation camp would not be available (as it is being constructed) from approximately three months to six months. During this initial construction phase, the Project construction workforce size would average 211 personnel and peak at approximately 300 personnel (Section 4.1.1 of the Social Impact Review).

Due to the highly specialised, skilled nature of the Project construction workforce, it is expected that 90% of the Project construction workforce would be filled by non-local workers and the remaining 10% filled by local residents already residing in the region (Section 4.1.1 of the Social Impact Review). The average and peak non-local workforce during the initial construction phase when the accommodation camp would not be available would be 190 personnel and 270 personnel, respectively.

A summary of the approved and modified accommodation demand over the initial construction phase when the accommodation camp would not be available is provided on Figure 4. The modified accommodation demand would vary month to month in line with the modified Project construction workforce (Figure 4). The modified accommodation demand (i.e. 190 accommodation units) would be approximately 25 units higher than the approved accommodation demand (i.e. 165 accommodation units) on average.

Figure 4
Summary of Approved and Modified Accommodation Demand and Existing Accommodation Supply



This average incremental demand represents approximately 1% of the total short-term accommodation and rental accommodation supply in the Lachlan, Parkes and Forbes Shires, respectively. It is noted that this estimate is conservative as the estimated available short-term accommodation units does not include short-term accommodation in the Lachlan Shire as the Australian Bureau of Statistics tourist accommodation data does not report the Lachlan Shire (Section 4.2.2 of Social Impact Review).

Based on the above, the short-term accommodation and rental markets would be able to cater for the additional non-local workforce during the initial six-month phase until first rooms are available at the accommodation camp (Section 4.2.2 of the Social Impact Review). Notwithstanding the above, once the timing of construction commencement has been confirmed, SEM would provide information regarding the Project workforce and the associated predicted housing demand to the LSC, PSC and FSC to minimise potential social impacts of the Project.

For Condobolin, the Modification is expected to reduce the accommodation demand during the initial construction phase when the accommodation camp would not be available relative to the approved Project. Accommodation demand for the approved Project was expected to be approximately 95 accommodation units in Condobolin (Martin & Associates Pty Ltd, 2000). For the modified Project, approximately 33% of the construction workforce is expected to reside in Condobolin during the initial construction phase (Section 4.1.1 of the Social Impact Review) which would result in an average and peak accommodation demand of approximately 65 and 90 accommodation units, respectively. The Modification would however extend the duration of this reduced accommodation demand in Condobolin from three to six months.

Once the accommodation camp becomes available in approximately month 7, the modified Project workforce would be accommodated in the accommodation camp and is not expected to impact the local housing market for the remainder of the construction phase (Section 4.2.3 of the Social Impact Review).

Health Service Impacts

Issue

The LSC raised concerns regarding the potential incremental health service impacts during the construction phase of the modified Project.

Response

The Modification would include an increase in the peak construction phase workforce from approximately 1,000 personnel to approximately 1,900 personnel and an increase to the duration of the construction phase from two to three years.

Due to the highly specialised, skilled nature of the construction workforce, it is expected that 90% of the Project construction workforce would be filled by non-local workers and the remaining 10% filled by local residents already residing in the region (Section 4.2.4 of the Social Impact Review).

Given the above, the majority of the Project construction workforce are expected to access most non-acute health care (e.g. routine GP visits) at their home location and therefore the Project construction workforce would have no significant impact on non-acute health care (Section 4.2.4 of the Social Impact Review).

Any increased demand during the construction phase may be associated with acute health care. SEM would provide first aid facilities at the mine and processing facility that would minimise demand for acute health care from existing health services (Section 4.2.4 of the Social Impact Review). The first aid facilities would be able to treat minor injuries (e.g. cuts) and illnesses (e.g. colds) the Project construction workforce may have while onsite. In addition, treatment of the Project construction workforce with minor illnesses onsite will not require a medical certificate to be provided from local health services. This will be managed by onsite health services.

More significant acute health care requirements are expected to be addressed by regional health services in Parkes and Dubbo (e.g. Parkes Hospital).

Given the above, the Modification is not expected to significantly change approved impacts on health services in the region.

Consideration of Cumulative Impacts

Issue

The LSC raised concerns regarding the Social Impact Review did not consider the Mineral Hill Gold Mine in the assessment of potential cumulative social impacts (including housing impacts).

Response

The Mineral Hill Gold Mine is located approximately 40 km north-west of the Project. Small-scale mining and processing operations have been undertaken at the Mineral Hill Gold Mine intermittently since 1988. Operations at the Mineral Hill Gold Mine recommenced in late 2020 after being in care and maintenance since 2016.

After recommencement, activities at the Mineral Hill Gold Mine are expected to occur for approximately 4 years and a workforce of approximately 20 personnel will be required. Local employees (including former Mineral Hill Gold Mine employees) will be preferentially employed where practicable (R. W. Corkery & Co, 2019) which would reduce potential social impacts (e.g. increased housing demand).

The potential social impacts associated with the recommencement of operations at the Mineral Hill Gold Mine were considered to be "largely positive" and would be greater than any adverse social impacts (R. W. Corkery & Co, 2019). In addition, the LSC (2020) noted that the recommencement of operations at the Mineral Hill Gold Mine would result in no significant change to social impacts.

Given the relatively small workforce associated with the Mineral Hill Gold Mine, and the potential social impact conclusions above, it is considered that the Mineral Hill Gold Mine, in conjunction with the identified social impacts of the Modification, would not contribute to significant cumulative social impacts (including housing availability).

Issue

The LSC raised concerns regarding the Social Impact Review did not consider the Western Slopes Pipeline in the assessment of potential cumulative social impacts.

Response

The Western Slopes Pipeline is a proposed high pressure gas pipeline that would connect the Narrabri Gas Project to the NSW gas transmission network and the pipeline alignment would be located to the north and west of the Project.

No Environmental Impact Statement for the Western Slopes Pipeline has been submitted at the time of submission of the Modification Report (Section 4.6 of the Social Impact Review). The Western Slopes Pipeline is therefore a 'potentially relevant' project and does not need to be considered in the Modification Report (including the Social Impact Review) in accordance with the draft *Assessing Cumulative Impacts Guide Guidance for State Significant Projects* (DPIE, 2020b) (Section 4.6 of the Social Impact Review).

Subsequent to the submission of the Modification Report, the DPIE (2021b) issued the *Cumulative Impact Assessment Guidelines for State Significant Projects*. The Western Slopes Pipeline is still considered a 'potentially relevant' project and does not need to be considered for the Modification under the latest DPIE guideline.

Notwithstanding the above, the potential interactions or cumulative social impacts of the Western Slopes Pipeline and other 'relevant' projects (e.g. the modified Project) will need to be assessed in the Western Slopes Pipeline Environmental Impact Statement in accordance with the Environmental Assessment Requirements for the Western Slopes Pipeline and the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPIE, 2021b).

Issue

The LSC raised concerns regarding the Social Impact Review did not consider the Moomba to Wilton Pipeline Modification 1 in the assessment of potential cumulative social impacts.

Response

The Moomba to Wilton Pipeline Modification 1 would involve the construction and operation of a new compression station on the Moomba to Wilton Pipeline approximately 35 km south-west of Condobolin. Construction and commissioning of the compressor station is expected to take place in 2022 and require an average and peak workforce of approximately 40 and 80 personnel, respectively. The workforce would reside in short-term accommodation in Condobolin or an onsite accommodation camp. The operational workforce would be 1 to 2 personnel (EMM, 2021).

No Modification Report for the Moomba to Wilton Pipeline Modification 1 had been submitted at the time of submission of the Modification Report. The Moomba to Wilton Pipeline Modification 1 is therefore a 'potentially relevant' project and does not need to be considered in the Modification Report (including the Social Impact Review) in accordance with the draft *Assessing Cumulative Impacts Guide Guidance for State Significant Projects* (DPIE, 2020b).

Subsequent to the submission of the Modification Report, the DPIE (2021b) issued the *Cumulative Impact Assessment Guidelines for State Significant Projects*. The Moomba to Wilton Pipeline Modification 1 is still considered a 'potentially relevant' project and does not need to be considered for the Modification under the latest DPIE guideline.

Notwithstanding the above, a Modification Report for the Moomba to Wilton Pipeline Modification 1 (EMM, 2021) was submitted after the submission of the Modification Report and therefore consideration of the Moomba to Wilton Pipeline Modification 1 is included herein. As the construction and commissioning of the compressor station is expected to occur in 2022, it is unlikely that the construction of the compressor station and the modified Project would occur simultaneously. This is consistent with the conclusions of the Modification Report for the Moomba to Wilton Pipeline Modification 1 (EMM, 2021).

Regional Employment Opportunities and Training

Issue

The LSC raised concern that the Modification would reduce employment opportunities for existing residents in the region and sought details of SEM's proposed training programs for existing residents.

Response

The Project (including the Modification) would provide significant employment opportunities for local residents residing in the region. The Modification would include an increase in the peak (average) construction phase workforce from approximately 1,000 (611) personnel to approximately 1,900 (962) personnel. Due to the highly specialised, skilled nature of the construction workforce, it is expected that approximately 90% of these construction roles would be filled by non-local workers and the remaining (10%) roles would be filled by local residents already residing in the region. The modified Project would therefore provide opportunities for up to approximately 190 local residents (Section 6.13.2 of the Modification Report).

A comparison of the approved and modified local construction workforce is provided in Table 3. The Modification would increase employment opportunities for local residents over the construction phase from approximately 257 full-time equivalents to 289 full-time equivalents.

Table 3
Approved and Modified Local Construction Workforce

Project	Total Workforce	Percentage Local Residents	Local Workforce	Duration of Construction Phase	Local Workforce Over Construction Phase (Full-Time Equivalent)[2]
Approved	Peak = 1,000 Average = 611	21%[1]	Peak = 210 Average = 128	2 Years	257
Modified	Peak =1,900 Average = 962	10%	Peak = 190 Average = 96	3 Years	289

[1] Martin & Associates Pty Ltd (2000).

[2] Based on average workforce.

The Modification would also include a minor increase in the operational workforce from approximately 335 personnel to approximately 340 personnel (the rail siding workforce would increase from five to 10 personnel) which would provide increased opportunities for local residents.

SEM would develop strategies to train and upskill people from the local area (particularly the unemployed) once the timing of construction commencement has been confirmed. This would maximise the number of local employees in the Project workforce.

Issue

The LSC indicated that the Modification may require changes to the community enhancement contribution component of the existing VPA to offset the increased demand on community infrastructure.

Response

SEM considers that the existing VPA community enhancement contribution (i.e. $200,000 per year [indexed]) is appropriate for the modified Project as the Modification would not significantly increase potential impacts on LSC-operated community infrastructure relative to the approved Project:

- The modified Project construction workforce would continue to be accommodated in the accommodation camp (once constructed) to minimise potential impacts on LSC-operated community infrastructure.
- The Modification is expected to reduce the peak accommodation demand in Condobolin during the initial construction phase when the accommodation camp would not be available from approximately 95 to 90 accommodation units and therefore there would be a reduction in potential impacts on LSC-operated community infrastructure during this phase of the modified Project.
- Although the Modification would increase the duration of the initial construction phase when the accommodation camp would not be available from three to six months, SEM would make an additional community enhancement contribution (i.e. $200,000 per year [indexed]) in accordance with the existing VPA as a result of the increased construction phase duration proposed as part of the Modification.
- The modified Project operational workforce would not significantly change (increase from 335 to 340 personnel) and therefore there would be no significant change to the potential impacts on LSC-operated community infrastructure during the 21 year operational phase of the modified Project.

Based on the above, SEM considers that no changes to its existing community enhancement contributions outlined in the existing VPA are required for the Modification.

4.6 ABORIGINAL HERITAGE

Issue

Heritage NSW requested that the Conditions 38 and 40(b), Schedule 3 of Development Consent (DA 374-11-00) be revised to replace “Condobolin Local Aboriginal Land Council” with “Registered Aboriginal Party”.

Response

SEM would be agreeable to existing Conditions 38 and 40(b), Schedule 3 of Development Consent (DA 374-11-00) being revised to replace “Condobolin Local Aboriginal Land Council” with “Registered Aboriginal Parties”.

4.7 WATER RESOURCES

Post-approval Requirements

Issue

DPIE-Water raised several post approval requirements regarding the Water Management Plan and NSW *Water Management Act 2000* approvals.

Response

As described in Sections 6.4.3 and 6.5.3 of the Modification Report (SEM, 2021), and in accordance with Condition 6, Schedule 5 of Development Consent (DA 374-11-00), the approved Groundwater Management Plan, Surface Water Management Plan, and Water Balance (Clean TeQ, 2019c; 2019d; 2019e) would be reviewed, and updated where necessary, to include the Modification (subject to any modified Development Consent conditions).

Consistent with Condition 26, Schedule 3 of Development Consent (DA 374-11-00), SEM would obtain sufficient water entitlements for the modified Project, and if necessary, adjust the scale of the modified Project to match its available water supply.

Consistent with Condition 29, Schedule 3 of Development Consent (DA 374-11-00), SEM would design, install and maintain infrastructure within 40 m of watercourses generally in accordance with the *Controlled Activities on Waterfront Land – Guidelines for Riparian Corridors on Waterfront Land* (Natural Resources Access Regulator, 2018).

4.8 HAZARD AND RISKS

Rail Siding Hazard and Risk Mitigation Measures

Issue

PSC requested that specific hazard-related mitigation measures outlined in the Preliminary Hazard Analysis be included as conditions in any modified Development Consent.

Response

Pinnacle Risk Management (2021) considered the risks associated with the modified rail siding in the Preliminary Hazard Analysis and it concluded that the potential for offsite impact at the rail siding would be negligible. No specific hazard-related mitigation measures at the rail siding were therefore proposed in the Preliminary Hazard Analysis.

The PSC separately indicated that it supports the recommendations of the Preliminary Hazard Analysis in an email dated 14 September 2021.

5 PROJECT EVALUATION

This Submissions Report provides responses to issues raised by submissions from government agencies and local councils during the public exhibition period for the Modification Report and has been prepared in consideration of the *State significant development guidelines – preparing a submissions report* (DPIE, 2021a).

The Modification Report provides an evaluation of the Modification in Section 7. This evaluation concluded that in weighing up the main environmental impacts (costs and benefits) associated with the proposal as assessed and described in the Modification Report, the Modification is, on balance, considered to be in the public interest of the State of NSW.

Since lodgement of the Modification Report, SEM has reviewed the submissions on the Modification and has continued to consult with members of the community, local councils and government agencies, and also sought additional advice from its technical specialists. Based on this further consideration and analysis, SEM has concluded that the key potential impacts and benefits of the Modification and the justification for the Modification remain consistent with the conclusions presented in Section 7 of the Modification Report.

In weighing up the main environmental impacts (costs and benefits) associated with the proposal as assessed and described in the Modification Report and this Submissions Report, the Modification remains, on balance, in the public interest of the State of NSW.

6 REFERENCES

Clean TeQ Sunrise Pty Ltd (2019a) *Road Upgrade and Maintenance Strategy.*

Clean TeQ Sunrise Pty Ltd (2019b) *Clean TeQ Sunrise Project Traffic Management Plan.*

Clean TeQ Sunrise Pty Ltd (2019c) *Clean TeQ Sunrise Project Groundwater Management Plan*.

Clean TeQ Sunrise Pty Ltd (2019d) *Clean TeQ Sunrise Project Surface Water Management Plan*.

Clean TeQ Sunrise Pty Ltd (2019e) *Clean TeQ Sunrise Project Water Balance*.

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Department of Environment and Conservation (2004) *Environmental Guidelines: Use of Effluent by Irrigation.*

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Lachlan Shire Council (2020) *Modification to Development Application Assessment*. Available at: https://www.lachlan.nsw.gov.au/f.ashx/DA-2011-18-Modification-to-Development-Application-Assessment-completed-by-Integrated-Consulting-Town-and-Bushfire-Planning.pdf

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NSW Government (2018) *Voluntary Land Acquisition and Mitigation Policy*.

NSW Roads & Traffic Authority (2011) *Railway Crossing Safety Series 2011 Plan: Establishing a railway crossing safety management plan*.

Pinnacle Risk Management Pty Ltd (2021) *Sunrise Project – Project Execution Plan Preliminary Hazard Analysis.*

R. W. Corkery & Co (2019) *Statement of Environmental Effects for the Reprocessing of Tailings at the Mineral Hill Mine*.

Ramboll Environ (2017) *Syerston Project Modification 4 Air Quality and Greenhouse Gas Assessment*.

Renzo Tonin & Associates (2017) *Syerston Project – Modification 4 Noise and Blasting Assessment*.

Renzo Tonin & Associates (2021) *Sunrise Project – Project Execution Plan Modification Noise Assessment.*

Sunrise Energy Metals Limited (2021) *Sunrise Project Project Execution Plan Modification Report.*

The Transport Planning Partnership (2021) *Sunrise Project Project Execution Plan Modification Road Transport Assessment*.

United States Environmental Protection Agency (2015) *Speciation Profiles and Toxic Emission Factors for Nonroad Engines.*

ATTACHMENT 1

SUBMISSIONS REGISTER

Table A1-1
Register of Submissions

Group	Reference Number	Name	Section where issues addressed in Submissions Report
Agencies	798921	DPIE – Crown Lands	Section 2.1
	798936	Regional NSW – Mining, Exploration & Geoscience	Section 2.1
	798941	DPIE – Biodiversity and Conservation and Science Directorate	Section 4.3
	799546	Heritage NSW	Section 4.6
	800106	Transport for NSW (duplicate submission with Roads and Maritime Services)	Section 4.4
	800131	Environment Protection Authority	Sections 4.1 and 4.2
	-	Department of Regional NSW – Resources Regulator	Section 2.1
	-	DPIE - Water	Section 4.7
Local councils	798926	Parkes Shire Council	Sections 4.4 and 4.8
	799571	Lachlan Shire Council	Sections 4.2, 4.4 and 4.5

ATTACHMENT 2

SUPPLEMENTARY ADVICE – AIR QUALITY

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29 September 2021

Ms Bronwyn Flynn
Environment, Approvals and Community Lead
Sunrise Energy Metals Limited
c/o Resource Strategies Pty Ltd

Project Name: Sunrise Project - Project Execution Plan Modification
Project Number: IS366000

Dear Bronwyn

Response to EPA Comments on Air Quality and Greenhouse Gas Assessment

The Modification Report for the Sunrise Project – Project Execution Plan (PEP) Modification (the Modification) was placed on public exhibition by the Department of Planning, Industry and Environment (DPIE) from 27 July 2021 to 9 August 2021.

During and following the exhibition period, submissions on the Modification were received from government agencies and relevant councils (including the Environment Protection Authority [EPA]).

The Modification Report included an Air Quality Assessment (AQA) prepared by Jacobs (2021). The EPA provided a submission on the Modification via letter on 19 August 2021 which requested additional information regarding the AQA. Three (3) items relating to the AQA were raised by the EPA:

1. Sulfuric Acid Mist (H_2SO_4). The EPA has requested a revision to the AQA to demonstrate that the H_2SO_4 contour is wholly within the project boundary based on site specific emission concentrations.

2. Air NEPM Standards. The EPA has requested an assessment of the Modification against the recently (2021) amended Ambient Air Quality NEPM Standards.

3. Volatile Organic Compounds (VOCs). The EPA requested the reference for benzene and 1,3-butadiene speciation from VOCs.

Information to address the EPA requests and queries is attached.

Yours sincerely

Shane Lakmaker
Principal (Air Quality)

Jacobs

29 September 2021

1. Sulfuric Acid Mist

a. Application of the impact assessment criteria for sulfuric acid

Section 6.3 of the AQIA advises that the predicted ground level concentrations for sulfuric acid do not exceed the EPA's impact assessment criteria contained in the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (the Approved Methods) at the nearest sensitive receptors.

Sulfuric acid is an individual toxic air pollutant as per the Approved Methods. Impact assessment criteria for individual toxic air pollutants apply at and beyond the boundary of the facility. Figure E3 of the AQIA provides a contour plot of potential impacts for sulfuric acid. The contour plot indicates there is potential for the impact assessment criteria for sulfuric acid to be exceeded beyond the site boundary.

Recommendation: The AQIA must be revised to demonstrate that compliance with the impact assessment criteria for sulfuric acid can be achieved. Consideration should be given to the assessment of potential impacts based on plant specific emission performance of sulfuric acid emissions.

In the AQA, the potential impacts of sulfuric acid mist (H_2SO_4) were determined by conservatively modelling the acid plant in-stack concentration at the limit for scheduled premises under the *Protection of the Environment Operations (Clean Air) Regulation 2010* (POEO Regulation) (i.e. 100 milligrams per cubic normal metre [mg/Nm^3]). A mass emission rate of 5.3 grams per second (g/s) was derived from the adopted 100 mg/Nm^3 limit using the exhaust flow conditions shown in Table 1. Emissions were modelled assuming continuous operation and the results presented in the AQA (Jacobs, 2021) would therefore reflect the maximum potential H_2SO_4 impacts.

Sunrise Energy Metals (SEM) has advised that, based on current designs, the plant specific emission performance would deliver an in-stack H_2SO_4 concentration of 60 mg/Nm^3, equating to a mass emission rate of 3.2 g/s (Table 1). The potential impacts of the plant operating at 60 mg/Nm^3 (H_2SO_4) have subsequently been modelled with the relevant input data shown in Table 1. Again it was assumed that the emissions would be continuous for every hour of the year.

Table 1 Modelled processing facility emissions

Source	Sulphuric acid plant stack at POEO Regulation limit[1]	Sulphuric acid plant stack as expected[2]
Modelled Easting (metres [m])	538400	538400
Modelled Northing (m)	6373390	6373390
Height (m)	40	40
Base elevation (m Australian Height Datum)	298	298
Stack tip diameter (m)	1.80	1.80
Exhaust temperature (°C)	75	75
Exhaust velocity (metres per second)	26.6	26.6
In-stack H_2SO_4 concentration (mg/Nm^3)	100	60
Mass emission rate of H_2SO_4 (g/s)	5.3	3.2

[1] Jacobs (2021).
[2] Source: SEM (2021).

Figure 1 shows the modelled 99.9th percentile H_2SO_4 concentrations due to the expected processing plant emissions (i.e. 60 mg/Nm^3 of H_2SO_4). The relevant EPA impact assessment criterion is 18 micrograms per cubic metre (µg/m^3), applied at the site boundary (EPA, 2016). It can be seen from these results that the 99.9th percentile concentrations of H_2SO_4 are not expected to exceed 18 µg/m^3 beyond the site boundary. In addition, the highest ground-level concentrations from the model were 18 µg/m^3 and near the processing facility. Therefore, the modified Project would comply with the H_2SO_4 criteria. The results assume continuous operation of the acid plant and should therefore represent a conservative estimate of impacts.

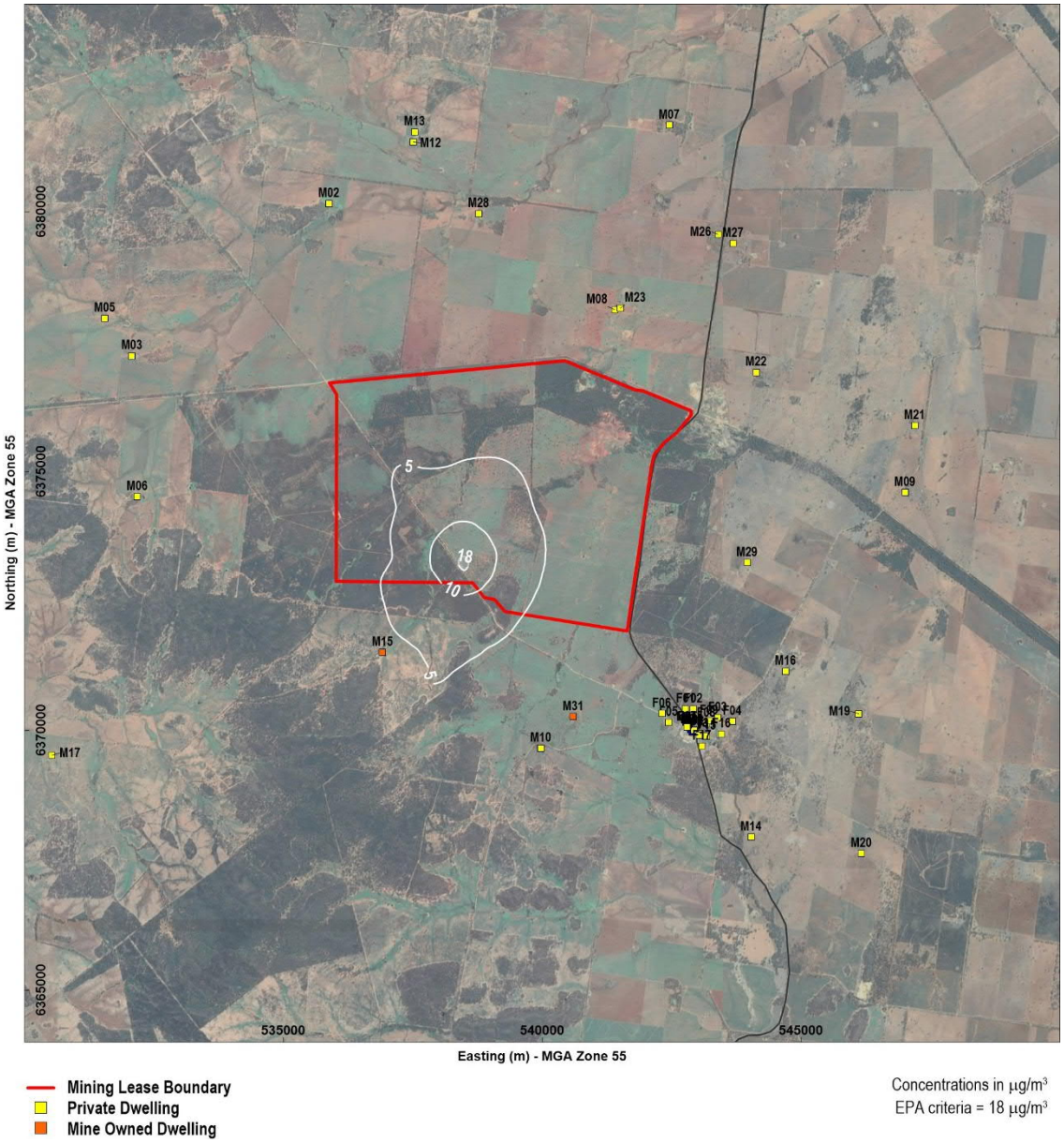

Figure 1 Modelled 99.9th percentile H_2SO_4 due to the processing facility

2. Air NEPM Standards

b. Assessment of impacts against recently revised Ambient Air NEPM standards not included

Section 6.3 of the AQIA provides an assessment of the potential impacts of emissions from the processing facility, and proposed modifications. The AQIA compares the predicted ground level concentrations against the impact assessment criteria contained in the Approved Methods.

In April 2021, the National Environment Protection Council (NEPC) agreed to vary the Ambient Air Quality NEPM. The amendment included variations to the national standards for SO2 and NO2. The AQIA does not include an assessment of potential impacts against the amended national standards for SO2 and NO2.

Recommendation: To ensure transparent and robust assessment, the EPA recommends that the AQIA be revised to include an assessment of impacts for the processing facility (including the proposed diesel generators) against the recently amended Ambient Air Quality NEPM Standards.

The AQA was prepared in accordance with the "Approved Methods for the Modelling and Assessment of Air Pollutants in NSW" (EPA, 2016) (the Approved Methods). The Approved Methods does not refer to the Ambient Air Quality NEPM. In addition, it is understood that the Modification is not required to be assessed against the Ambient Air Quality NEPM as the purpose of the Ambient Air Quality NEPM is to provide "a national framework for monitoring and reporting on exposure to common ambient air pollutants", and is not intended for the assessment of individual projects. Notwithstanding the above, an assessment of the predicted nitrogen dioxide (NO_2) and sulfur dioxide (SO_2) concentrations against the recently amended Ambient Air Quality NEPM Standards has been made as per the EPA's request.

The relevant changes to the Ambient Air Quality NEPM include more stringent standards for NO_2 and SO_2.

Figure 2 to Figure 5 show the predicted NO_2 and SO_2 concentrations due to the processing facility and the relevant amended NEPM criteria.

Table 2 includes an assessment of the model results against the amended NEPM Standards. The model shows that the amended NEPM Standards would not be exceeded at any sensitive receptor due to the operation of the processing facility. Compliance with the amended NEPM Standards is therefore anticipated.

Table 2 Assessment of the processing facility against the recently amended NEPM

Air quality indicator	Averaging time	EPA criterion (µg/m^3)	Amended NEPM Standard (µg/m^3)		Assessment against the recently amended NEPM
			2021	2025	
Nitrogen dioxide (NO_2)	1-hour	246	164	164	Compliance with amended NEPM Standards at all sensitive receptors. Maximum at sensitive receptors[1] = 13 µg/m^3
	Annual	62	31	31	Compliance with amended NEPM Standards at all sensitive receptors. Maximum at sensitive receptors = 0.5 µg/m^3
Sulphur dioxide (SO_2)	1-hour	570	286	214	Compliance with amended NEPM Standards at all sensitive receptors. Maximum at sensitive receptors = 62 µg/m^3
	24-hour	228	57	57	Compliance with amended NEPM Standards at all sensitive receptors. Maximum at sensitive receptors = 12 µg/m^3

[1] M10 – maximum NO_2 concentration due to emissions from the processing facility only.

Concentrations of NO_2 due to the potential cumulative contributions of the processing facility, mine site diesel exhaust and mine site blasting activities are also not expected to exceed the amended NEPM Standards. This is confirmed by Table 3 which shows the modelled contributions of these sources to NO_2 concentrations at the potentially most affected sensitive receptors (on a cumulative basis).

The cumulative results represent a worst-case scenario as the maximum contributions from the processing facility would not be expected to occur at the same time as blasting contributions, or diesel exhaust contributions. Nevertheless, the modelling shows that the amended NEPM Standards would not be exceeded.

Table 3 Assessment of the cumulative NO_2 against the recently amended NEPM

Air quality indicator	Averaging time	EPA criterion (µg/m^3)	Amended NEPM Standard (µg/m^3)		Concentration at the most affected sensitive receptor (M08) (µg/m^3)			
			2021	2025	Due to processing facility	Due to blasting	Due to diesel exhaust	Cumulative
Nitrogen dioxide (NO_2)	1-hour	246	164	164	9[1]	69	37	115
	Annual	62	31	31	0.5[1]	0	5.5	6.0

[1] M08 – maximum NO_2 concentration due to emissions from the processing facility, mine site diesel exhaust and mine site blasting activities.

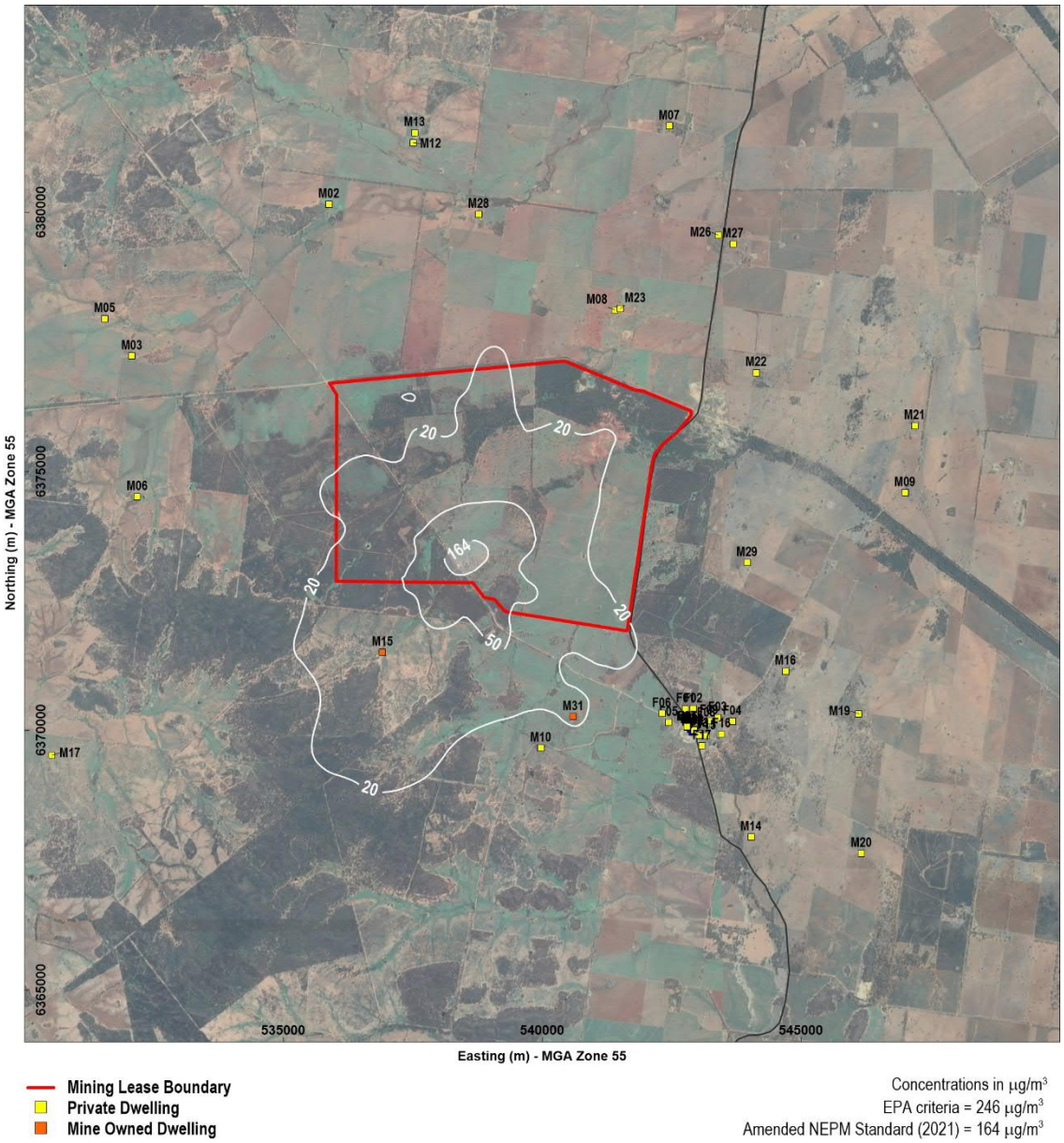

Figure 2 Modelled maximum 1-hour average NO_2 due to the processing facility

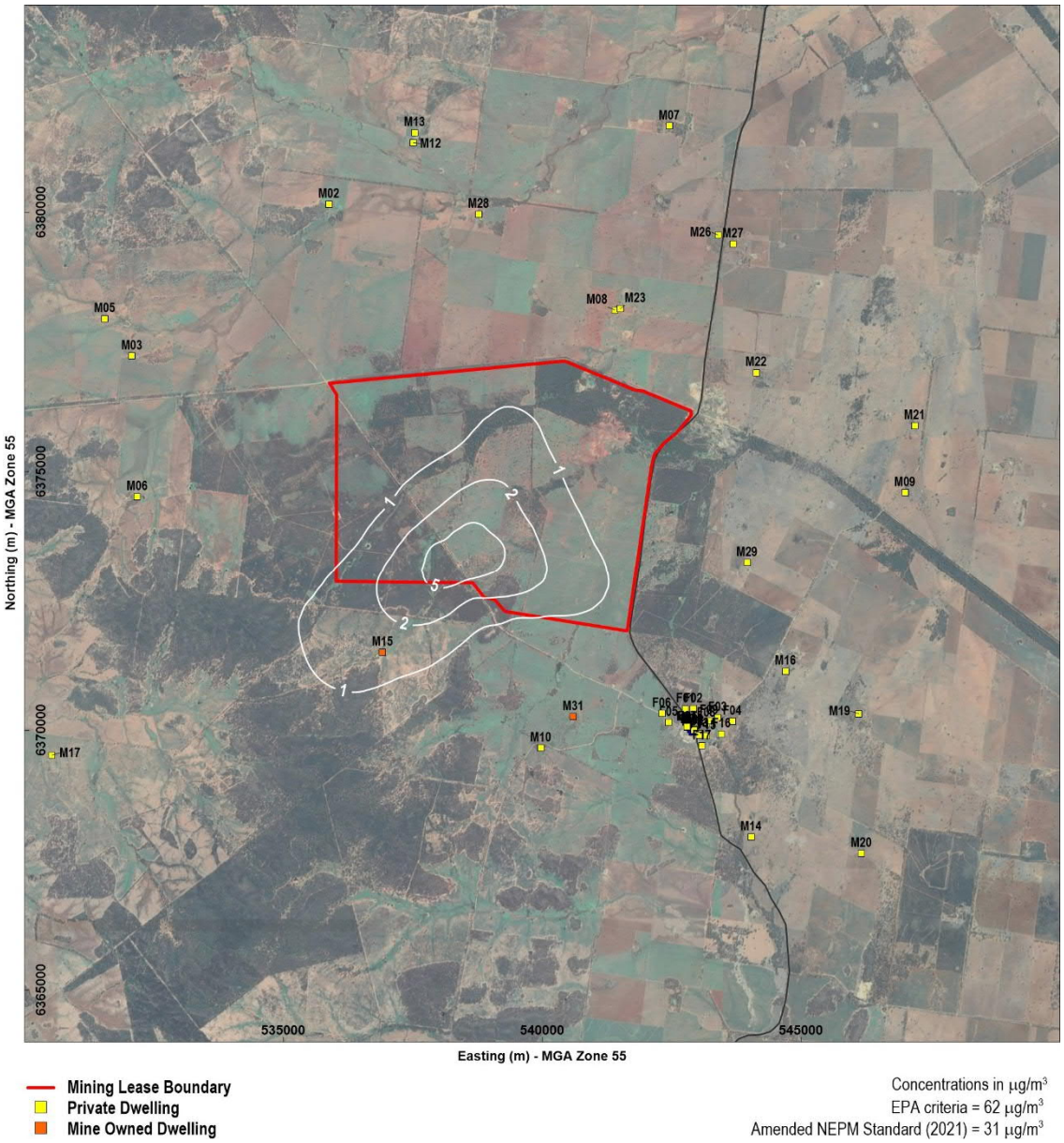

Figure 3 Modelled annual average NO_2 due to the processing facility

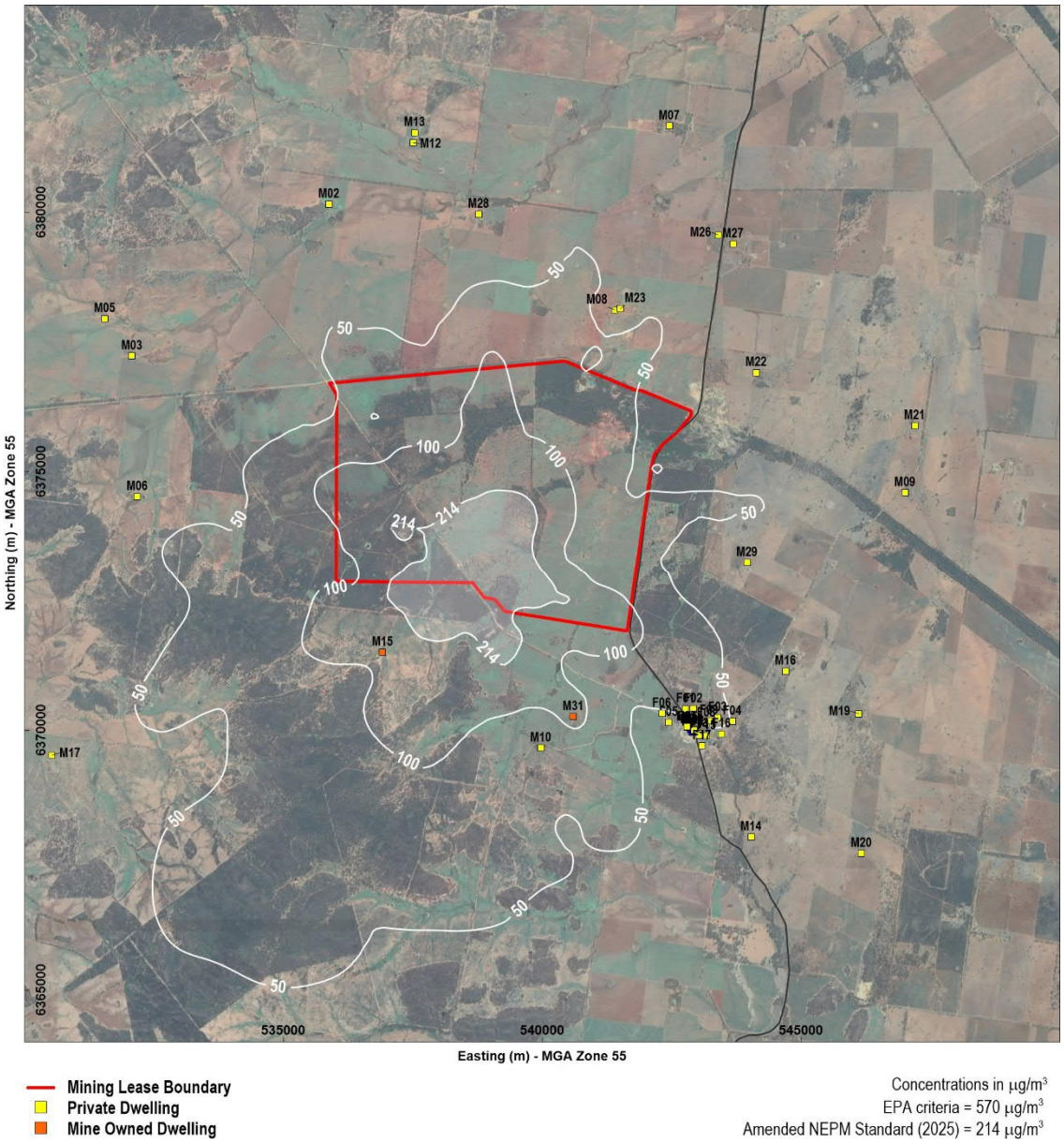

Figure 4 Modelled maximum 1-hour average SO_2 due to the processing facility

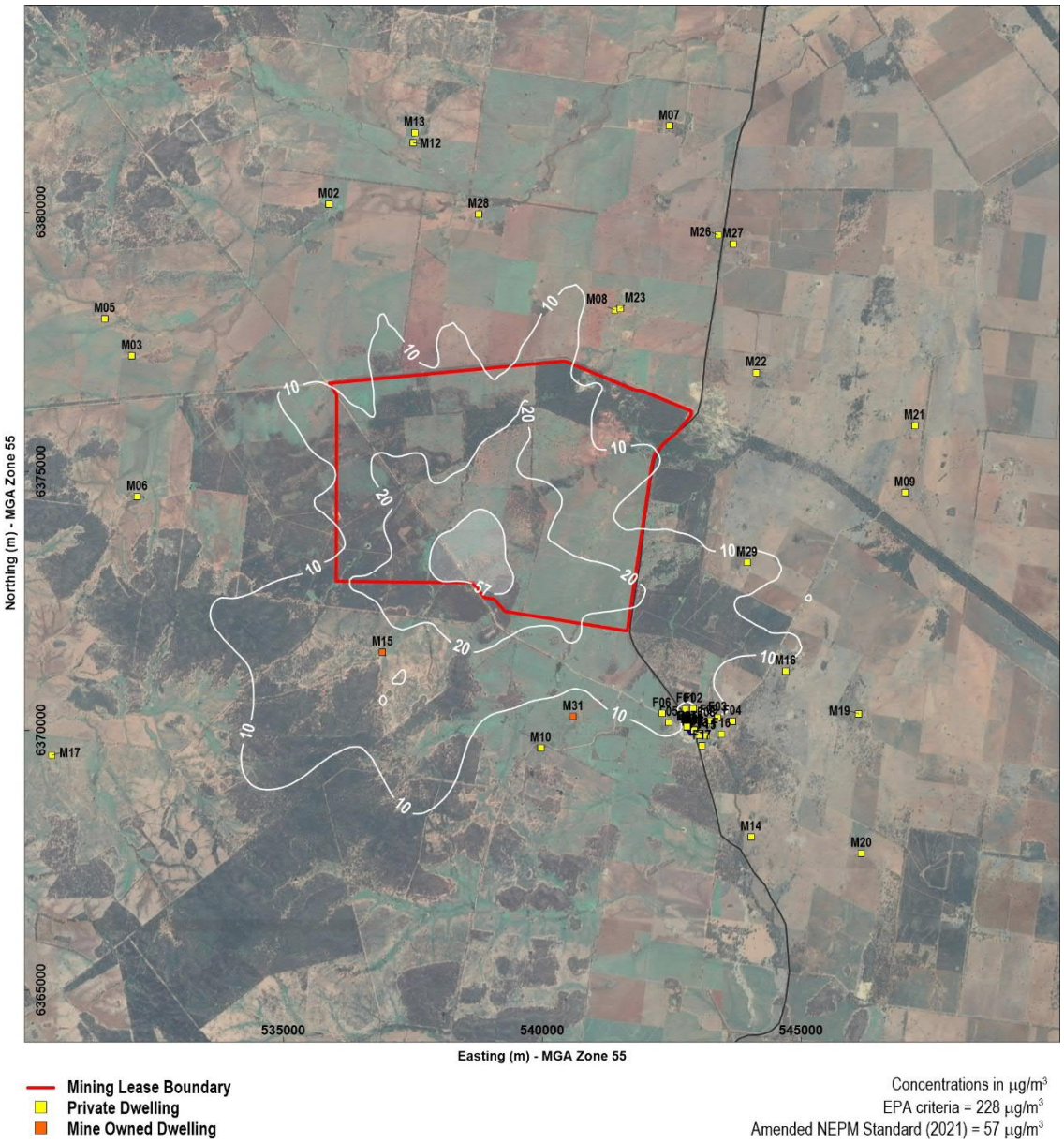

Figure 5 Modelled maximum 24-hour average SO_2 due to the processing facility

3. Volatile Organic Compounds (VOCs)

c. Assessment methodology for speciated Volatile Organic Compounds not described

Section 6.3 of the AQIA provides an assessment of the potential impacts of select Volatile Organic Compounds (VOCs), specifically benzene and 1,3-butadiene. Table 5.3 of the AQIA provides the emission rates for assessed air pollutants for the processing facility. However, Table 5.3 only includes total Volatile Organic Compounds and not the emission rates derived for speciated Volatile Organic Compounds. Further, the AQIA does not describe the methodology for estimating and assessing impacts of speciated VOCs. As such, the AQIA has not transparently demonstrated that an assessment of reasonable worst-case impacts of speciated VOCs has been undertaken.

Recommendation: The AQIA be revised to:

- Provide further detail on the methodology for assessing speciated VOCs, including any data sources referenced for estimating VOCs emissions.
- Demonstrate that the assessment methodology for volatile organic compounds is representative of reasonable worst-case emissions and potential impacts.

The modelled VOC emissions have been presented in Table 5.3 of the AQA (Jacobs, 2021). Results from modelling the VOC emissions were then used to derive benzene and 1,3-butadiene concentrations based on the speciation data for diesel engines outlined by the US EPA (2015). Specifically:

- Benzene is 7.9% of total VOCs
- 1,3-butadiene is 7% of total VOCs

The percentages listed above were also applied and reported for Modification 4 (Ramboll Environ, 2017). In addition, the assumed percentages above are higher (i.e. more conservative) than those derived from the National Pollutant Inventory (NPI) emission factors for stationary diesel engines which suggest that benzene and 1,3-butadiene emissions are less than 1% of the total VOCs (NPI, 2008).

Mass emission rates of VOCs were calculated to reflect in-stack concentrations at the limit (40 mg/Nm^3) for scheduled premises under the POEO Regulation. Again, it was assumed that emissions would be released continuously from all sources for 24 hours per day, every day of the year. This is a conservative approach that should be representative of reasonable worst-case emissions and potential impacts.

4. References

EPA (2016) “Approved Methods for the Modelling and Assessment of Air Pollutants in NSW”. Environment Protection Authority.

Jacobs (2021) “Sunrise Project – Project Execution Plan Modification – Air Quality Assessment”. Report prepared by Jacobs Group (Australia) Pty Ltd for Sunrise Energy Metals Limited. Final, Revision 1, dated 30 June 2021.

NPI (2008) “National Pollutant Inventory Emission Estimation Technique Manual for Combustion Engines”. Version 3.0, June 2008. Published by the Australian Government Department of Environment, Water, Heritage and the Arts.

Ramboll Environ (2017) “Syerston Project Modification 4 Air Quality and Greenhouse Gas Assessment”.

US EPA (2015) “Speciation Profiles and Toxic Emission Factors for Nonroad Engines”. Prepared by the Office of Transportation and Air Quality, U.S. Environmental Protection Agency, March 2015.

ATTACHMENT 3

SUPPLEMENTARY ADVICE – NOISE

29 September 2021
TJ345-14F02 EPA RTS (r5).docx

Sunrise Energy Metals Limited
Ms Bronwyn Flynn
Environment, Approvals and Community Lead

From: William Chan [William.Chan@renzotonin.com.au]

Sunrise Project Project Execution Plan Modification - Response to Noise-related Matters in the EPA Submission

1 Introduction

The Modification Report for the Sunrise Project – Project Execution Plan Modification (the PEP Modification) was placed on public exhibition by the Department of Planning, Industry and Environment (DPIE) from 27 July 2021 to 9 August 2021.

The Modification Report included a Noise Assessment prepared by Renzo Tonin & Associates (2021) (the PEP Modification Noise Assessment).

The Environment Protection Authority (EPA) provided a submission on the Modification Report via letter on 19 August 2021 which requested additional information regarding the PEP Modification Noise Assessment.

2 Response to EPA's submission

Responses to the matters relating to the potential noise impacts of the PEP Modification in the EPA's submission is provided below.

Item 1.a. Existing statutory noise limits

In the NIA, Table 4.1 and Table 9.6 have not referenced the current Environment Protection Licence Number 21146 construction noise limits.

Recommendation: The NIA should compare the current and applicable noise limits with the predicted noise levels and justify any exceedances.

The construction noise limits from Environment Protection Licence (EPL) 21146 are reproduced below:

Time period	Measurement parameter	Measurement frequency	Noise Level dB(A)
Day	LAeq (15 minute)	-	40
Evening	LAeq (15 minute)	-	35
Night	LAeq (15 minute)	-	35
Night	Night-LA1 (1 minute)	-	45

With the exception of the night $L_{A1\ (1\ min)}$, the EPL 21146 construction noise limits are consistent with the Interim Construction Noise Guideline (ICNG) (Department of the Environment and Climate Change, 2009) evening and night noise management levels that were considered in the PEP Modification Noise Assessment (Section 7.1 of the PEP Modification Noise Assessment). However, the day time construction noise limit in EPL 21146 is 5 dB(A) lower than the day (standard hours) noise management level of 45 dB(A) considered in the PEP Modification Noise Assessment. The difference between the two day time criteria is because the noise management level adopted in the PEP Modification Noise Assessment was conservatively determined based on a higher day time minimum background noise level (i.e. 35 dB[A]) consistent with the Noise Policy for Industry (EPA, 2017) (NPfI) compared to the day time minimum background noise level (i.e. 30 dB[A]) used to develop the EPL 21146 criteria in accordance with the now superseded NSW Industrial Noise Policy (INP) (EPA, 2000).

The predicted construction noise levels from the construction of the modified mine and processing facility experienced by surrounding privately-owned residential receivers are 24 dB(A) and below (Section 8.4 of the PEP Modification Noise Assessment). Therefore, the predicted noise levels at the modified mine and processing facility are below the construction noise limits stipulated in EPL 21146 for the day, evening and night periods.

The predicted construction noise levels from the construction of the modified rail siding experienced by surrounding privately-owned residential receivers are 37 dB(A) and below (Section 8.4 of the PEP Modification Noise Assessment). It is noted that the construction of the rail siding is limited to the day time period only. Therefore, the predicted noise levels at the modified rail siding are below the construction noise limits stipulated in EPL 21146 for the day time period.

Item 1.b. Clarification on modifying factor calculations

The NIA should provide further information on the assessment of modifying factors according to Fact Sheet C of the Noise Policy for Industry (EPA, 2017) (NPfI), particularly for low frequency noise. It is also not clear from the NIA if the noise emissions at the source or receiver were assessed for modifying factors. The NPfI requires the potential for modifying factors to be assessed using the total predicted noise level at the receiver.

An example method is available in the Acoustics Australia forum article "An example approach to consider low frequency noise in the context of the NSW noise policy for industry" (Acoustics Australia (2020) 48:149-180, https://doi.org/10.1007/s40857-020-00199-x).

<u>Recommendation:</u> Calculations and information to support the assessment of modifying factors in accordance with NPfI Fact Sheet C should be presented in the NIA.

Modifying factor adjustments, as per Fact Sheet C of the NPfI, were considered by Renzo Tonin & Associates for all proposed plant and equipment in Sections 8.2 and 9.2 of the PEP Modification Noise Assessment. Based on Renzo Tonin & Associates' experience, noise from all proposed plant and equipment, individually and in combination, were considered to not exhibit tonal, low-frequency, impulsive, and/or intermittent characteristics. Therefore, no modifying factors corrections were considered to be required in the PEP Modification Noise Assessment.

Notwithstanding the above, a low frequency noise assessment has been conducted to determine whether the identified receivers would require the application of a modifying factor correction due to dominant low frequency noise content experienced at the receiver locations. The low frequency noise assessment was based on:

- overall C-weighted and A-weighted predicted noise levels; and
- one-third octave predicted noise levels in the range of 10-160 Hertz (Hz).

The C-weighted minus A-weighted noise level assessment was conducted for all receivers under all assessed meteorological conditions. The maximum case C-weighted minus A-weighted noise level difference for each receiver for each of the three modelled years are presented in Table 1.

Table 1 – C-weighted minus A-weighted noise level

Receiver	$L_{ceq,15min}$ minus $L_{Aeq,15min}$ Noise Level, dB(A)		
	Year 1	Year 10	Year 17
Mine Site and Processing Facility			
M01	**22.6**	**17.4**	**18.6**
M02	**20.6**	**15.3**	**17.4**
M03	**25.0**	**23.3**	**24.9**
M04	**22.5**	**20.7**	**22.6**
M05	**24.8**	**23.1**	**25.0**
M06	**27.4**	**26.6**	**27.3**
M07	**22.1**	**18.6**	**15.9**
M08	**16.8**	**16.4**	14.2
M09	**20.3**	**24.8**	**20.3**
M10	**22.4**	**20.6**	**22.6**
M12	**20.1**	**15.5**	**16.2**
M13	**19.8**	**15.4**	**16.4**
M14	**25.6**	**25.8**	**25.7**
M15	**24.9**	**24.4**	**24.3**
M16	**23.0**	**24.3**	**19.9**
M17	**29.6**	**29.3**	**29.5**
M18	**24.9**	**26.2**	**20.9**
M19	**25.3**	**26.0**	**22.0**
M20	**25.4**	**23.9**	**23.8**
M21	**21.4**	**21.8**	**20.6**
M22	**15.8**	**15.5**	**16.4**
M23	**15.3**	**16.4**	13.9
M24	**26.6**	**24.1**	**25.7**
M25	**26.5**	**24.3**	**26.4**
M26	**20.7**	**18.4**	**17.7**
M27	**21.2**	**18.1**	**16.2**

Receiver	$L_{ceq,15min}$ minus $L_{Aeq,15min}$ Noise Level, dB(A)		
	Year 1	Year 10	Year 17
M28	**22.1**	**15.9**	**14.9**
M29	**15.4**	**15.9**	**17.4**
M31	**20.0**	**19.6**	**21.4**
M32	**24.5**	**22.4**	**22.2**
M33	**21.8**	**18.1**	**18.1**
M34	**22.7**	**17.8**	**18.4**
M35	**21.6**	**17.5**	**17.2**
F01	**25.2**	**24.5**	**20.5**
F02	**25.7**	**25.7**	**20.9**
F03	**23.0**	**21.6**	**22.4**
F04	**24.6**	**19.8**	**21.5**
F05	**22.3**	**20.0**	**22.0**
F06	**21.7**	**19.8**	**22.2**
F07	**22.5**	**17.2**	**17.9**
F08	**26.2**	**26.0**	**21.7**
F09	**18.8**	**16.3**	**18.2**
F10	**24.4**	**21.1**	**22.0**
F11	**24.5**	**22.5**	**22.0**
F11	**24.5**	**22.5**	**22.0**
F13	**25.0**	**22.7**	**23.2**
F14	**25.2**	**23.9**	**22.9**
F15	**18.4**	14.8	**16.6**
F16	**21.8**	**17.9**	**19.1**
F17	**23.6**	**21.3**	**23.0**
F18	**25.2**	**24.3**	**23.9**
F19	**20.9**	**17.7**	**18.0**
Rail Siding			
Q01	**31.4**	-	-
Q02	**31.3**	-	-
Q03	**29.5**	-	-
Q04	**28.2**	-	-
Q05	**27.6**	-	-
Q06	**21.4**	-	-
Q08	**19.6**	-	-
Q09	**23.2**	-	-
Q11	**28.3**	-	-
Q12	**29.5**	-	-
Q13	**27.5**	-	-
Q14	**30.3**	-	-
Q15	**31.0**	-	-
Q16	**30.0**	-	-
Q17	**26.0**	-	-
Q18	**26.5**	-	-
Q19	**19.9**	-	-
Q20	**23.6**	-	-
Q22	10.9	-	-
Q23	**23.5**	-	-
Q24	**23.8**	-	-
Q25	**28.4**	-	-
Q26	**19.5**	-	-

Notes **Bold** font denotes noise level difference of 15 dB(A) or more.

As construction of the Project (with the exception of components of the borefield in 2006) has not commenced and therefore monitoring data are not available, a reliable dataset available to establish a typical low frequency spectrum shape is taken from the paper "Acoustic Signature of Open Cut Coal Mines" by Jeffrey Parnell (2015), NSW Department Planning and Environment and shown in Table 2 below.

Table 2 – Typical low frequency spectrum shape

Hz/dB(Z)	One-third octave $L_{Zeq,15min}$ threshold level												
Frequency (Hz)	**10**	**12.5**	**16**	**20**	**25**	**31.5**	**40**	**50**	**63**	**80**	**100**	**125**	**160**
Haul Trucks	47	56	70	63	62	61	53	52	47	48	45	45	40
Coal Washery[1]	47	47	54	40	38	38	43	47	46	47.5	45	38	28

Notes 1. Considered representative of the remainder of fleet and equipment minus haul trucks.

The low frequency spectrum shape was then normalised to the 63 Hz octave band component of the predicted noise levels for haul trucks and the remainder of the fleet and equipment for identified receivers and the sum compared against the low-frequency noise thresholds presented in Table C2 of the NPfI (Table C2 of the NPfI is reproduced below). The 63 Hz octave component is considered to be the most reliable octave band, as source spectra were not always available at lower octave bands.

Table C2: One-third octave low-frequency noise thresholds.

Hz/dB(Z)	One-third octave $L_{Zeq,15min}$ threshold level												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

The low frequency curves for the relevant receivers are provided in Appendix B. In accordance with the NPfI, a modifying correction factor of up to 5 dB is required if a noise source contains low frequency noise characteristics. Therefore, Appendix B focusses on receivers with predicted levels of less than or equal to 30 dB(A) (i.e. 5 dB[A] less than the adopted evening and night-time criteria).

It was found that all normalised low frequency spectrum shapes for all receivers where C-weighted minus A-weighted noise levels are greater than 15 dB(A) are below the low frequency noise threshold (Appendix B) in Table C2 of the NPfI.

Therefore, the low frequency noise assessment found that it is unlikely that any of the identified receivers would experience dominant low frequency noise and no modifying factor correction for low frequency noise is required for the PEP Modification which is consistent with the outcomes of the PEP Modification Noise Assessment.

Item 1.c. Discrepancies in sound power levels between modifications

Chapter 9.2 of the NIA states that the sound power levels have been determined based on manufacturers specifications and the consultant's internal database. The EPA has compared the sound power levels used in Mod 7 NIA with those used in Mod 4 NIA and found that there are differences in the sound power levels used for the same item of equipment. The EX1200 excavator, 992K Front End Loader, 777D Haul truck, M6290 Drill, 16M Grader and 825H Roller all have lower sound power levels in Mod 7 than Mod 4. No justification has been provided for these differences.

Furthermore, some other items of equipment appear to be lower than expected without specific mitigation measures mentioned, for example the D10 Dozer. In the event that the proponent is seeking to increase noise limits, all reasonable and feasible mitigation measures must be implemented.

<u>Recommendation:</u> With respect to equipment sound power levels, the proponent should:

i. *Clarify and justify the differences in sound power levels used in Mod 7 compared with that used in previous modifications.*

ii. *Provide the data source reference for each item of plant.*

iii. *Clarifies the mitigation packages and their expected effectiveness applied to each item of plant.*

As construction of the Project (with the exception of components of the borefield in 2006) has not commenced, attended on site noise measurements of the specified plant items are not available. Furthermore, it is expected that, when operations do commence, SEM would utilise 'best practice' fleet for the Project.

Given the above, 'best practice' sound power levels for each of the proposed fleet items for the modified Project were selected from similar projects as well as Renzo Tonin & Associates' internal database. The updated sound power levels (compared to previous modifications) used in the PEP Modification Noise Assessment are considered to be representative of the 'best practice' fleet to be adopted at the modified Project. Sound power level references and any noise attenuation packages for the modelled fleet are provided in Table 3 below.

Table 3 – Modelled Sound Power Levels and References

Item	Spec	Modelled SWL, dB(A)	Reference
Mine Site and Processing Facility			
Process Plant	-	124	Assumed consistent with the Cowal Gold Operation processing plant (Renzo Tonin & Associates, 2018)
FEL	966	112	IMD Battler Gold Project (Lloyd George Acoustics Pty Ltd, 2016)
FEL	992K	115	Range 112-117 dB(A) – Assumed 115 dB(A) 112 dB(A) Ranger 3 Deeps Underground Mine (SLR, 2014) 113 dB(A) Thunderbird Mineral Sands Project (WSP/Parsons Brinckerhoff, 2016) 114 dB(A) Maxwell Project (Wilkinson Murray, 2019) 117 dB(A) from Renzo Tonin & Associates Database
Haul Truck (Waste)	777D	115	Mt Arthur Coal (Wilkinson Murray, 2013)
Haul Truck (Ore) / Moxy	740	110	Range 107-113 dB(A) – Assumed 110 dB(A) 107 dB(A) Springbank Off stream reservoir project (Stantec, 2018) 113 dB(A) for typical 40t haul truck from Renzo Tonin & Associates Database
Rock Breaker	CAT336DL	117	Typical rock breaker from Renzo Tonin & Associates Database
Tractor	773F	114	Moolarben Coal (SLR, 2017)
Excavator (Ore)	EX1200	115	Tomingley Gold Project (SLR, 2011)
Excavator (Waste)	Hitachi EX2500-6 Shovel or EX2500	115	Assumed same noise level as EX1200 (SLR, 2011)
Drill Rig	M6290	111	Typical drill rig level of 114 dB(A) from Renzo Tonin & Associates Database – assume the use of an enclosure to reduce by 3 dB(A)
Grader	16M	108	Moolarben Coal (SLR, 2017)
Compactor	CP64	110	Renzo Tonin & Associates Database
Franna Crane	-	110	Renzo Tonin & Associates Database
Integrated Tool Carrier	950H	110	Assumed same noise level as 980H
Integrated Tool Carrier	980H	110	Based on 31t loader during face shovel extracting/loading dump trucks from Renzo Tonin & Associates Database
Water Cart	777F	105	Richard Heggie Associates (2000).
Dozer	D10	109	Thunderbird Mineral Sands Project (WSP/Parsons Brinckerhoff, 2016)
Roller	825H	107	Richard Heggie Associates (2000).
Service Truck	-	105	Renzo Tonin & Associates Database
Heavy Vehicle	-	105	Renzo Tonin & Associates Database
Forklift	MHT-X	103	Based on typical level of Telescopic Handler in Renzo Tonin & Associates Database
Elevated Work Platform	-	98	Renzo Tonin & Associates Database
LV	-	88	Renzo Tonin & Associates Database
Scraper	-	110	Renzo Tonin & Associates Database

Item	Spec	Modelled SWL, dB(A)	Reference
Rail Siding			
Scraper	-	110	Renzo Tonin & Associates Database
Concrete Truck	-	106	Renzo Tonin & Associates Database
Dozer	-	109	Thunderbird Mineral Sands Project (WSP/Parsons Brinckerhoff, 2016)
Excavator	-	107	Renzo Tonin & Associates Database
Light Vehicle	-	88	Renzo Tonin & Associates Database
Roller	-	109	Renzo Tonin & Associates Database
Scraper	-	110	Renzo Tonin & Associates Database
Truck	-	109	Renzo Tonin & Associates Database – assumed typical dump truck
Grader	-	114	Renzo Tonin & Associates Database
998 FEL	-	117	Boggabri Coal Mine (Global Acoustics, 2016)
Locomotive	-	110	Renzo Tonin & Associates Database
Reach Stacker	-	106	Renzo Tonin & Associates Database
Forklift	-	103	Assumed to be MHT-X as per mine

Item 1.d. Change in predicted noise levels at receivers compared to previous modifications

The EPA has compared the predicted noise levels at receivers with the existing statutory noise limits, the proposed Project Noise Trigger Levels (PNTLs), and previous predictions for the premises presented in earlier modifications, most notably Mod 4 NIA. It appears that noise from this modification is predicted to exceed existing statutory noise limits during the day, evening and night at Currajong Park and during the evening and night at Brooklyn, Slapdown and Rosehill and during the night at Glenburn. This represents an increase compared to previous predictions in Mod 4 NIA. The NIA does not provide sufficient information for the EPA to understand the causes and areas which have significantly influenced the change and increase in noise levels compared to previous assessments.

<u>Recommendation:</u> The proponent should provide an explanation of the change in noise levels caused by Mod 7 and include what the significant aspects contributing to the change are.

Relative to the Modification 4 Noise Assessment (Renzo Tonin & Associates, 2017), the noise predictions for the PEP Modification have changed because of:

1. Project changes proposed as part of the PEP Modification, including (Section 2.1 of the PEP Modification Noise Assessment):

    a. optimised production schedule resulting in an increased mining rate during the initial years of mining and associated changes to mining and waste rock emplacement sequencing; and

b. revised tailings storage facility cell construction sequence.

2. Changes to the assessable meteorological conditions due to:

   a. Changes to the adopted meteorological data (the PEP Modification Noise Assessment adopted site-specific meteorological data which were not available for the Modification 4 Noise Assessment).

   b. Updated NSW noise assessment policy (further detail is provided below).

Notwithstanding the project changes, the change in predicted noise levels associated with the PEP Modification is mainly attributed to the changes in assessable meteorological conditions. The Modification 4 Noise Assessment was prepared in accordance with the now superseded INP, whereas the PEP Modification Noise Assessment was prepared in accordance with the NPfI (which superseded the INP). Table 4 presents a comparison of the meteorological conditions that were considered in the Modification 4 Noise Assessment in accordance with the INP and the meteorological conditions that were considered in the PEP Modification Noise Assessment in accordance with the NPfI.

In the Modification 4 Noise Assessment, calm conditions were modelled with no wind for day, evening and night period, whereas the equivalent standard conditions in the PEP Modification Noise Assessment were modelled with the more conservative 0.5 metres per second (m/s) windspeed, in accordance with the NPfI. Also, the Modification 4 Noise Assessment modelled F Class inversion with a lapse rate of 3°C / 100m whereas the inversion in the PEP Modification Noise Assessment were modelled with the more conservative lapse rate of 4°C / 100m. Furthermore, the PEP Modification Noise Assessment considered an additional four adverse wind conditions that were not assessed previously.

Table 4 – Comparison of Modification 4 and PEP Modification Meteorological Assessment Conditions

Period	Meteorological Condition Type	Windspeed (Default)	Wind Direction	Inversion
Modification 4 Noise Assessment				
Day	Standard Conditions	Calm	-	-
Evening	Standard Conditions	Calm	-	-
Night	Standard Conditions	Calm	-	-
	Adverse Conditions	-	-	3°C / 100 m
PEP Modification Noise Assessment				
Day	Standard Conditions	0.5 m/s	Source-receiver	-
Evening	Standard Conditions	0.5 m/s	Source-receiver	-
	Adverse Conditions	3 m/s	South	-
		3 m/s	South-southwest	-
		3 m/s	South-west	-
		3 m/s	West-southwest	-
Night	Standard Conditions	0.5 m/s	Source-receiver	-
	Adverse Conditions	-	-	4°C / 100 m

Item 1.e. Change in assessed mine years compared to previous modifications

The noise assessment scenarios in the Mod 4 NIA were mining years 6, 11 and 21, and in the Mod 7 NIA they are years 1, 10 and 17. No explanation or justification has been provided in the Mod 7 NIA for the change of assessment years and how these years represent the impacts across the life of the mine.

Recommendation: The proponent should provide a justification for the changes in the assessed years and clarify the difference in impacts for the scenarios assessed in previous modifications.

As described in response to Item 1d, the PEP Modification includes changes to the operations at the mine and processing facility. A review of the modified operations was therefore conducted to identify the maximum case noise impact scenarios for assessment in the PEP Modification Noise Assessment.

In accordance with the NPfI, the assessment should consider *all stages of project development*. The maximum case scenarios selected for mine and processing facility operational noise modelling for the PEP Modification to consider all stages of Project development were (Section 9 of the PEP Modification Noise Assessment):

- Year 1 – the year of commencement of maximum operational fleet.
- Year 10 – reduced operational fleet with the north-western waste emplacement at an indicative height of approximately 323 metres (m) Australian Height Datum (AHD) and the north-eastern waste emplacement at an indicative height of approximately 298 m AHD.
- Year 17 – reduced operational fleet with the north-western waste emplacement at maximum height of approximately 330 m AHD and the north-eastern waste emplacement at maximum height of approximately 315 m AHD.

Although the indicative year of these scenarios is different to those adopted in the Modification 4 Noise Assessment, the activities included in the scenarios are very similar (refer to Section 8.1 of the Modification 4 Noise Assessment).

Item 1.f. Clarification and analysis of reasonable and feasible mitigation measures

It is not clear if investigation of at-source mitigation has taken place for this modification. The EPA was unable to identify in the Mod 7 NIA any discussion of the potential to reduce noise at the source through use of alternative equipment or applying mitigation to plant. In the event that the proponent seeks to increase noise limits, mitigation measures must be investigated and implemented where reasonable and feasible.

Recommendation: The proponent should clarify the at source mitigation considered, rejected and implemented for the modification and justify that all reasonable and feasible mitigation has been included in the assessment.

Renzo Tonin & Associates conducted an assessment of reasonable and feasible noise mitigation measures for the mine and processing facility as part of the PEP Modification Noise Assessment. The iterative steps undertaken as part of this assessment are described below:

1. Preliminary noise modelling of scenarios representative of the maximum noise emissions from the modified Project to identify the potential for noise exceedances (Section 9.4 of the PEP Modification Noise Assessment).

2. Evaluation of various combinations of noise management and mitigation measures to assess their relative effectiveness including:

    a. Mine layout and the location of fleet items;

    b. Consideration of alternative plant / processes where possible;

    c. Selection of lower noise generating fleet items where possible; and

    d. Utilisation of mine layout / topography to maximise noise shielding.

3. Review of the effectiveness of these measures and assessment of their feasibility by SEM.

4. Adoption of management and mitigation measures to appreciably reduce noise emissions associated with the modified Project.

Based on this assessment, the additional reasonable and feasible mitigation measures would be adopted at the modified mine and processing facility during relevant adverse meteorological conditions in the evening period including (Section 9.4 of the PEP Modification Noise Assessment):

- Cease operations on the north-eastern waste emplacement and ceased operation of an excavator in the eastern open cut pit during predominant south-southwest, south-west and west-southwest wind conditions in Year 10.

- Cease haulage on the north-western waste emplacement during predominant southerly wind conditions in Year 10.

- Cease haulage on the north-eastern waste emplacement during south-southwest and south-west wind conditions in Year 17.

Furthermore, SEM would have a daytime and evening/night-time fleet with reduced ore and waste haul trucks during the evening and night (Section 9.2 of the PEP Modification Noise Assessment). Subsequently, SEM has reduced operations during the evening and night-time in the scheduled mine plan which appreciably reduced the predicted noise levels during these periods.

Despite the implementation of these reasonable and feasible mitigation measures in the PEP Modification Noise Assessment, an increase in the predicted noise levels was predicted at Currajong Park 1 and 2. The key noise generating fleet items affecting these receivers included the EX1200 excavator operating in the eastern pit, the processing facility and operations on the north-eastern and north-western waste emplacements.

The assessment of reasonable and feasible noise mitigation measures included a review of at source mitigation measures for the key noise generating fleet items (e.g. attenuating fleet items and the construction of acoustic bunds) to reduce potential noise emissions at Currajong Park 1 and 2 to below the relevant Development Consent (374-11-00) criteria (i.e. 37 dB[A] in the day, evening and night-time periods)[1]. A summary of the outcomes of this review is provided below.

Attenuation of Fleet

As described in the response to Item 1.c, the adopted sound power levels for the fleet items at the modified mine and processing facility are considered to be representative of a 'best practice' fleet and therefore there would be limited opportunities to reduce predicted noise levels further with attenuation.

Notwithstanding the limited opportunity to attenuate fleet, a 3 dB(A) reduction for the 777D waste haul truck sound power level was considered. A 3 dB(A) reduction for the 777D waste haul trucks would result in a reduction in predicted noise levels of up to 1 dB(A) at Currajong Park 1 and 2 (depending on meteorological conditions). Therefore, Currajong Park 1 and 2 would continue to experience a moderate exceedance as defined under the *Voluntary Land Acquisition and Mitigation Policy* (NSW Government, 2018) (i.e. no change to the impact category). As all of the 777D waste haul trucks that would operate on the north-eastern waste emplacement (up to seven haul trucks in the evening/night-time periods) would need to be attenuated, the cost associated with the implementation of this mitigation measure would be significant. These significant costs associated with attenuation of this fleet were not considered reasonable given the limited reduction in predicted noise levels expected at Currajong Park 1 and 2.

Acoustic Bunds

The use of acoustic bunds to maximise shielding of key noise generating fleet items, most notably in the early years of operation on the north-eastern waste emplacement and eastern open cut pit, was considered.

[1] Currajong Park 1 and 2 has predicted exceedances of the NPfI criteria of greater than 2 dB(A) and were therefore the focus of the further noise mitigation assessment.

An acoustic bund could be located on the northern side of the north-eastern waste emplacement to potentially shield receivers located to the north (e.g. Currajong Park 1 and 2). Acoustic bunds are typically effective when the fleet is operating in close proximity to them. As the north-eastern waste emplacement is progressively constructed to the north and north-west, and the fleet (e.g. 777D waste haul trucks) would approach the north-eastern emplacement from the south, it is considered that an acoustic bund located north of the waste emplacement to shield receivers located to the north (e.g. Currajong Park 1 and 2) would not be effective as the fleet items operating could only operate in close proximity to the emplacement for a short period of time. In addition, the acoustic bund would result in limited noise mitigation when inversion conditions are present at the mine and processing facility. Given the above, the use of acoustic bunds to maximise shielding of key noise generating fleet items on the north-eastern waste emplacement to appreciably reduce predicted noise levels at nearby receivers was not considered feasible.

To shield noise emissions from the eastern pit (e.g. the EX1200 excavator), the viability of locating an acoustic bund to the north of the eastern open cut pit was considered during the early years of operations. From approximately Year 5 onwards, the north-eastern waste emplacement would generally act as an acoustic bund, shielding operations in the open cut pit for the receivers located to the north. To be potentially effective in the early years of operations, the acoustic bund would need to be approximately 10 m high and approximately 1 km long, and the operation of key noise generating fleet items would be restricted to be within close proximity to the acoustic bund. In addition, the acoustic bund would result in limited noise mitigation when inversion conditions are present at the mine and processing facility. The significant costs associated with constructing such a large acoustic bund and the restrictions to the operation of the key noise generating fleet items (e.g. the EX1200 excavator) were not considered reasonable and feasible.

In conclusion, SEM would utilise ‘best practice’ fleet for the Project and has included reduced operations during the evening and night in the scheduled mine plan. SEM reviewed reasonable and feasible noise mitigation measures for the mine and processing facility as part of the PEP Modification Noise Assessment, resulting in SEM ceasing key noise generating activities during relevant adverse weather conditions in Years 10 and 17. These measures appreciably reduced the predicted noise levels. Despite this, an increase in the predicted noise levels was predicted at Currajong Park 1 and 2, mainly due to the changes in assessable meteorological conditions for the Modification given the implementation of the NPfI.

Notwithstanding, SEM considered additional opportunities to further reduce the predicted noise levels at Currajong Park 1 and 2, however no further mitigation measures (in addition to those presented in the PEP Modification Noise Assessment) were considered reasonable or feasible.

3 References

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Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed / Authorised
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We have derived data in this report from information sourced from the Client (if any) and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination and re-evaluation of the data, findings, observations and conclusions expressed in this report.

We have prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

The information contained herein is for the purpose of acoustics only. No claims are made and no liability is accepted in respect of design and construction issues falling outside of the specialist field of acoustics engineering including and not limited to structural integrity, fire rating, architectural buildability and fit-for-purpose, waterproofing and the like. Supplementary professional advice should be sought in respect of these issues.

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APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Adverse weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
Assessment point	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of every day sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 115dB Limit of sound permitted in industry 120dB Deafening
dB(A)	A-weighted decibels. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L_{Max}	The maximum sound pressure level measured over a given period.
L_{Min}	The minimum sound pressure level measured over a given period.

L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.

APPENDIX B Low frequency noise spectra at representative receivers

Figure B.1 – Year 1 Low Frequency Noise Spectra (Receivers M02 to M27)

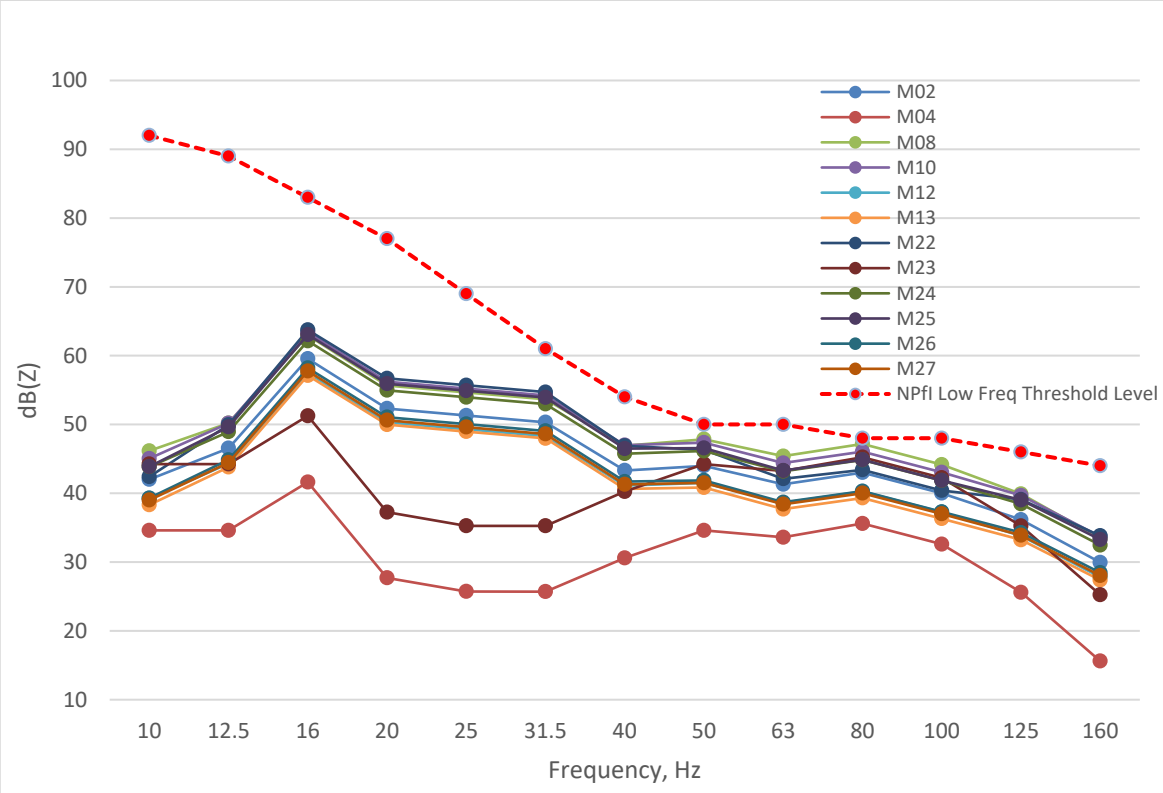


Figure B.2 – Year 1 Low Frequency Noise Spectra (Receivers M28 to F14)

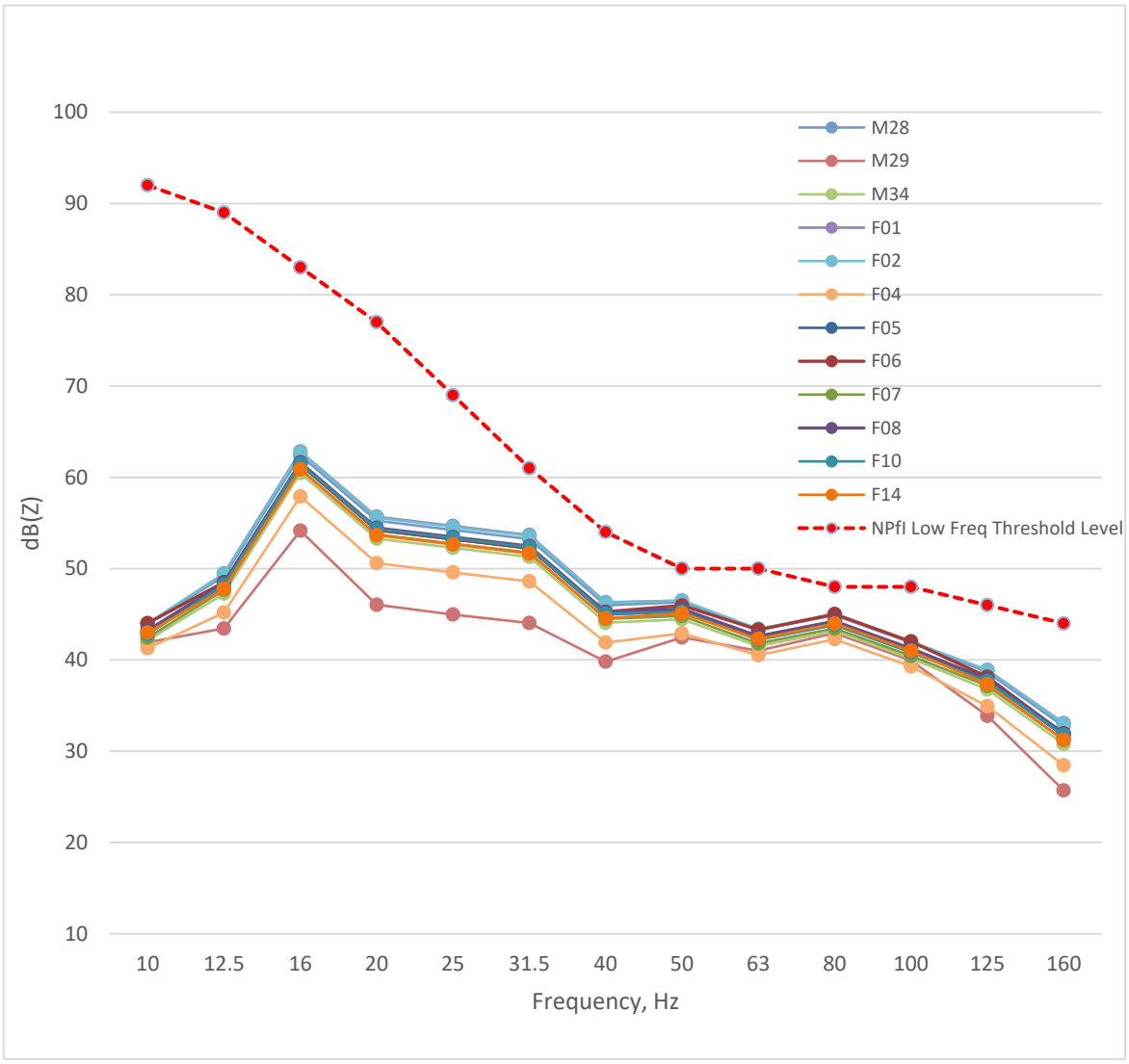


Figure B.3 – Year 10 Low Frequency Noise Spectra (Receivers M02 to M27)

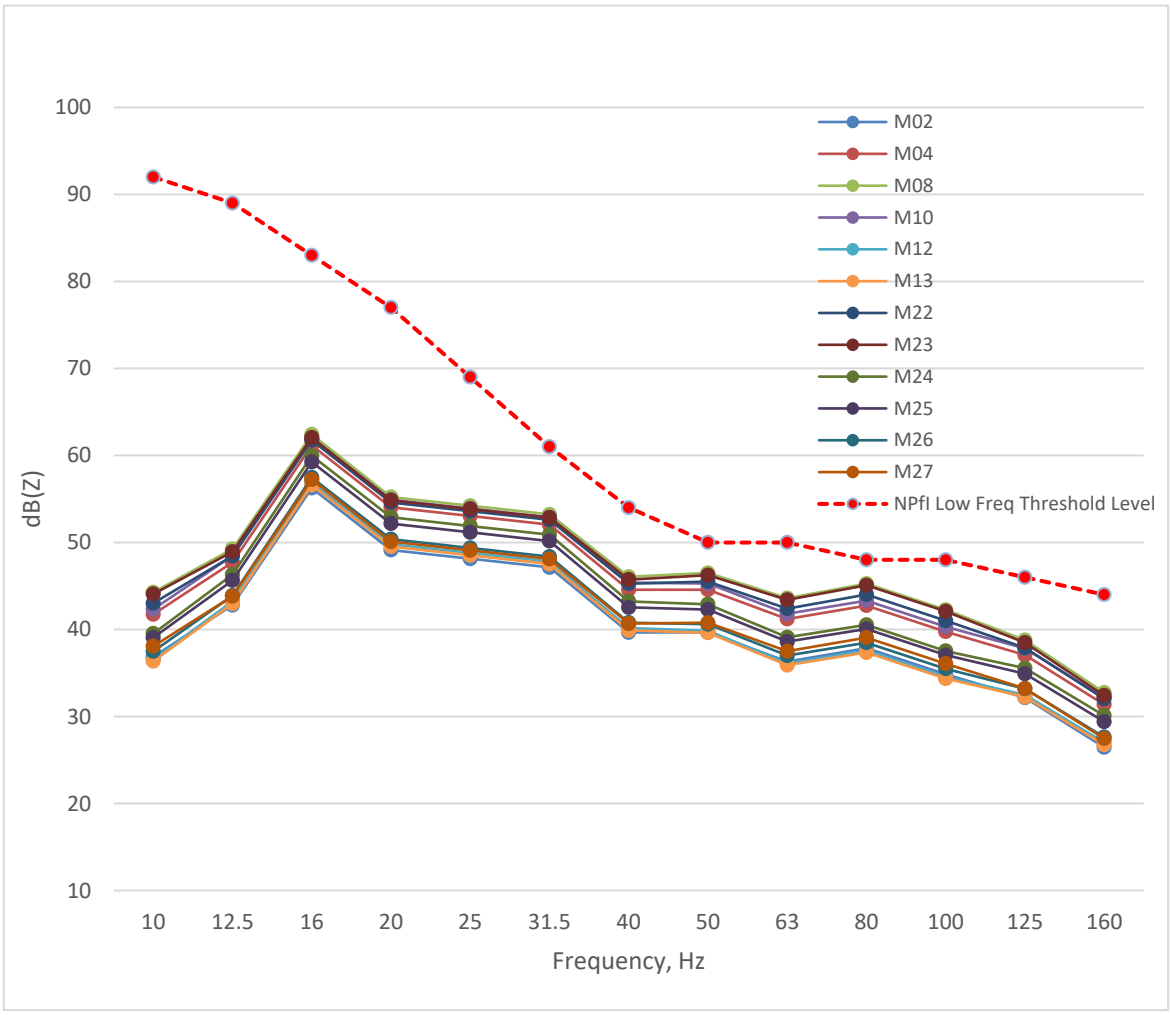


Figure B.4 – Year 10 Low Frequency Noise Spectra (Receivers M28 to F14)

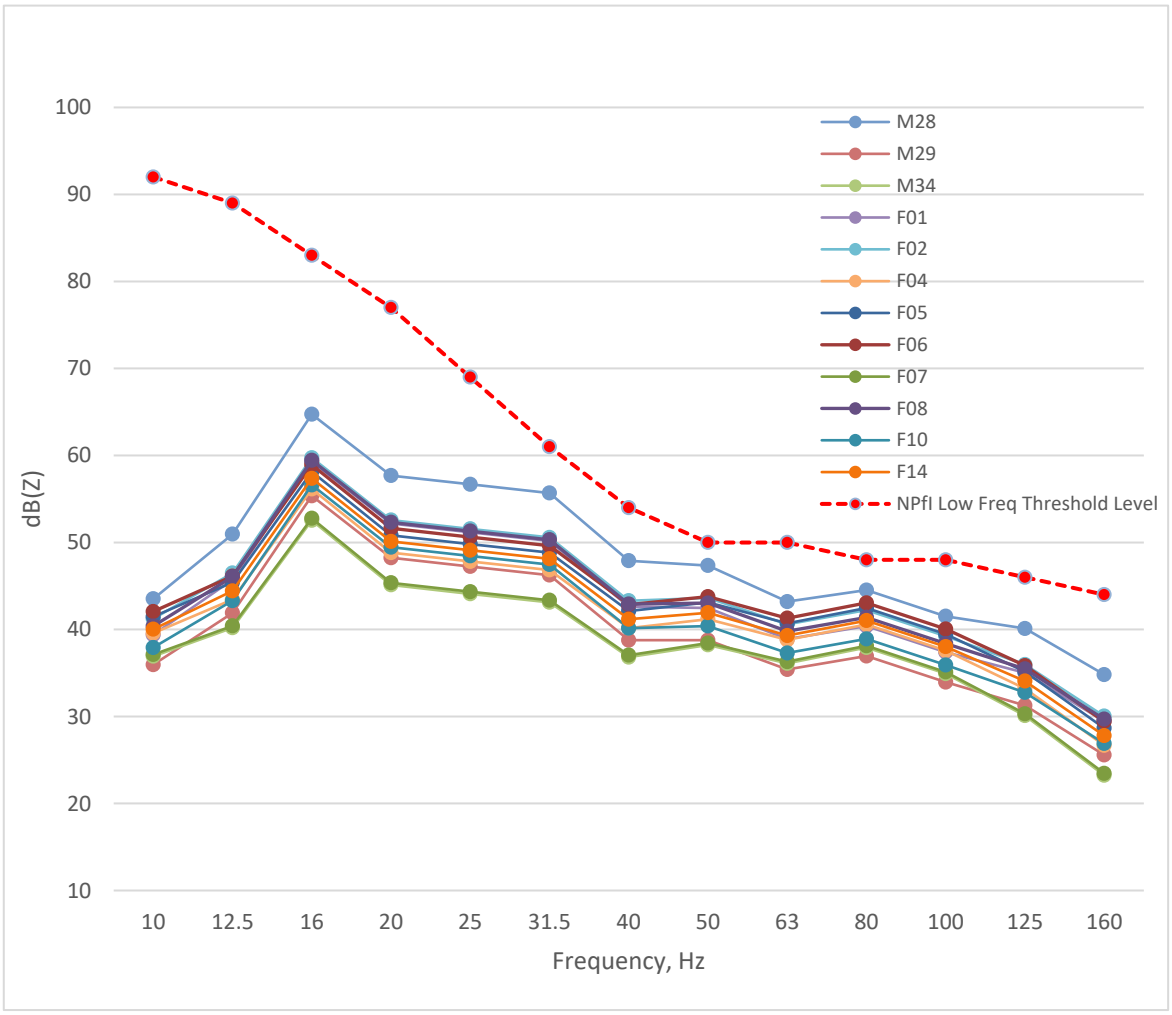


Figure B.5 – Year 17 Low Frequency Noise Spectra (Receivers M02 to M27)

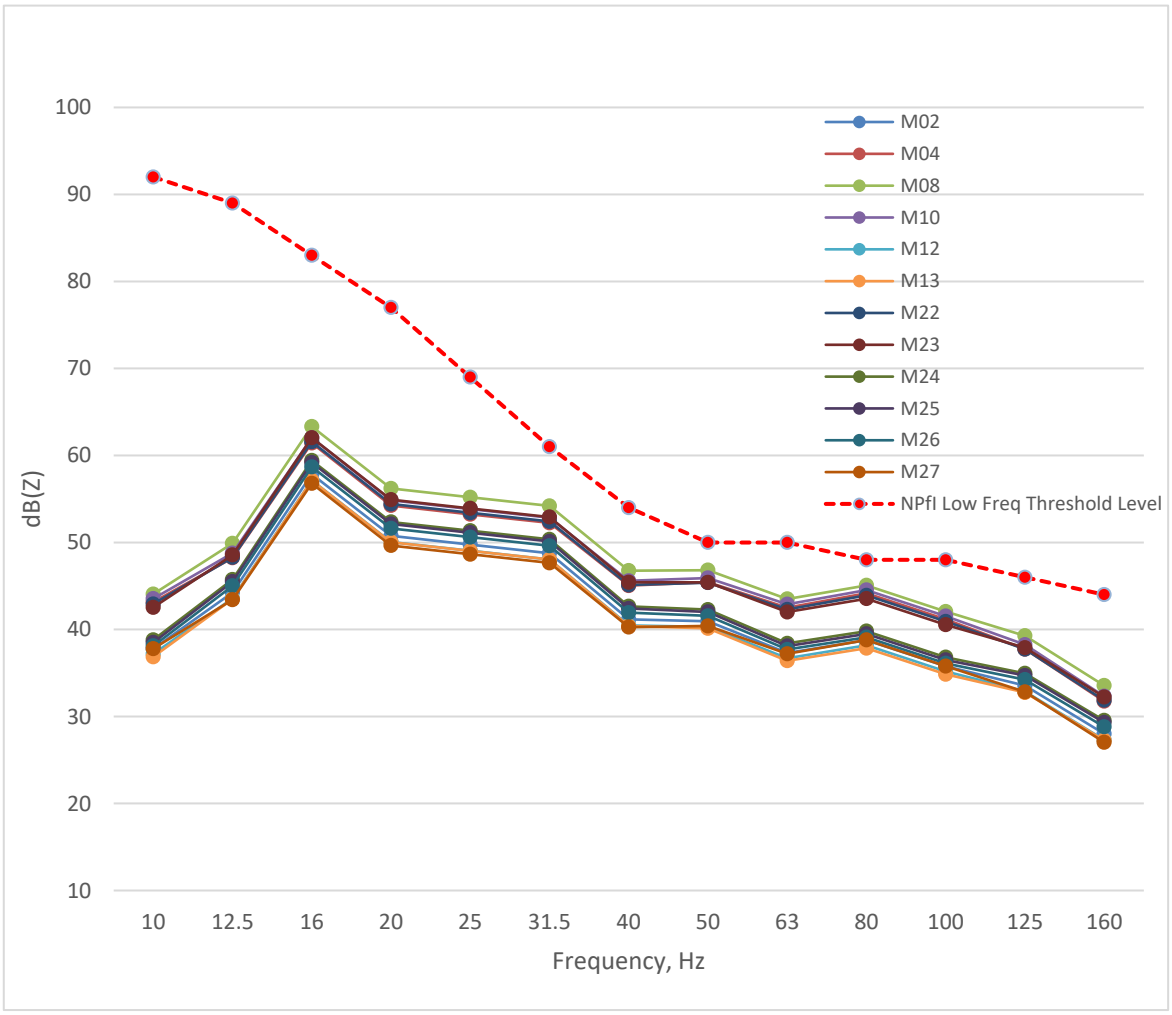


Figure B.6 – Year 17 Low Frequency Noise Spectra (Receivers M28 to F14)

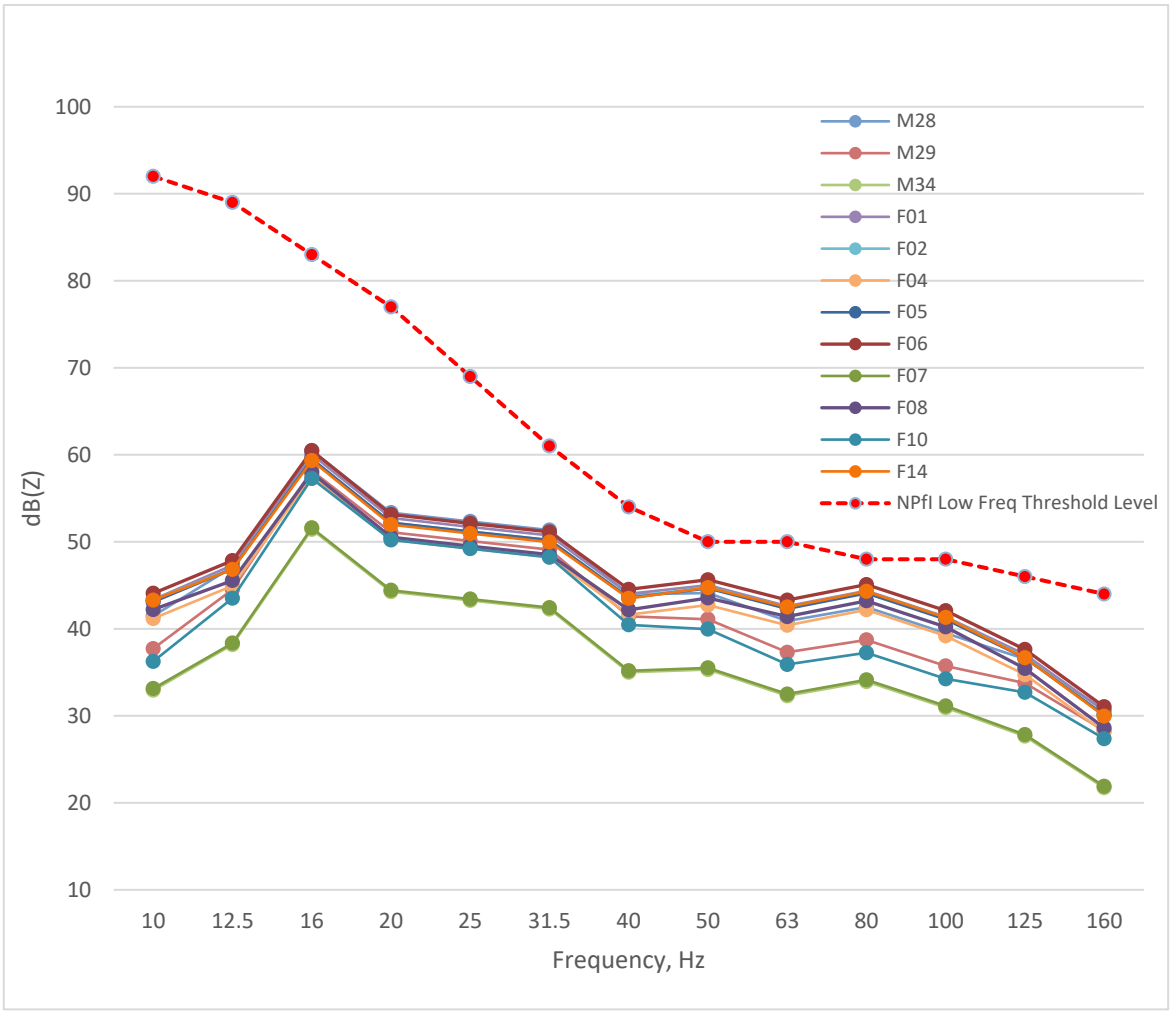
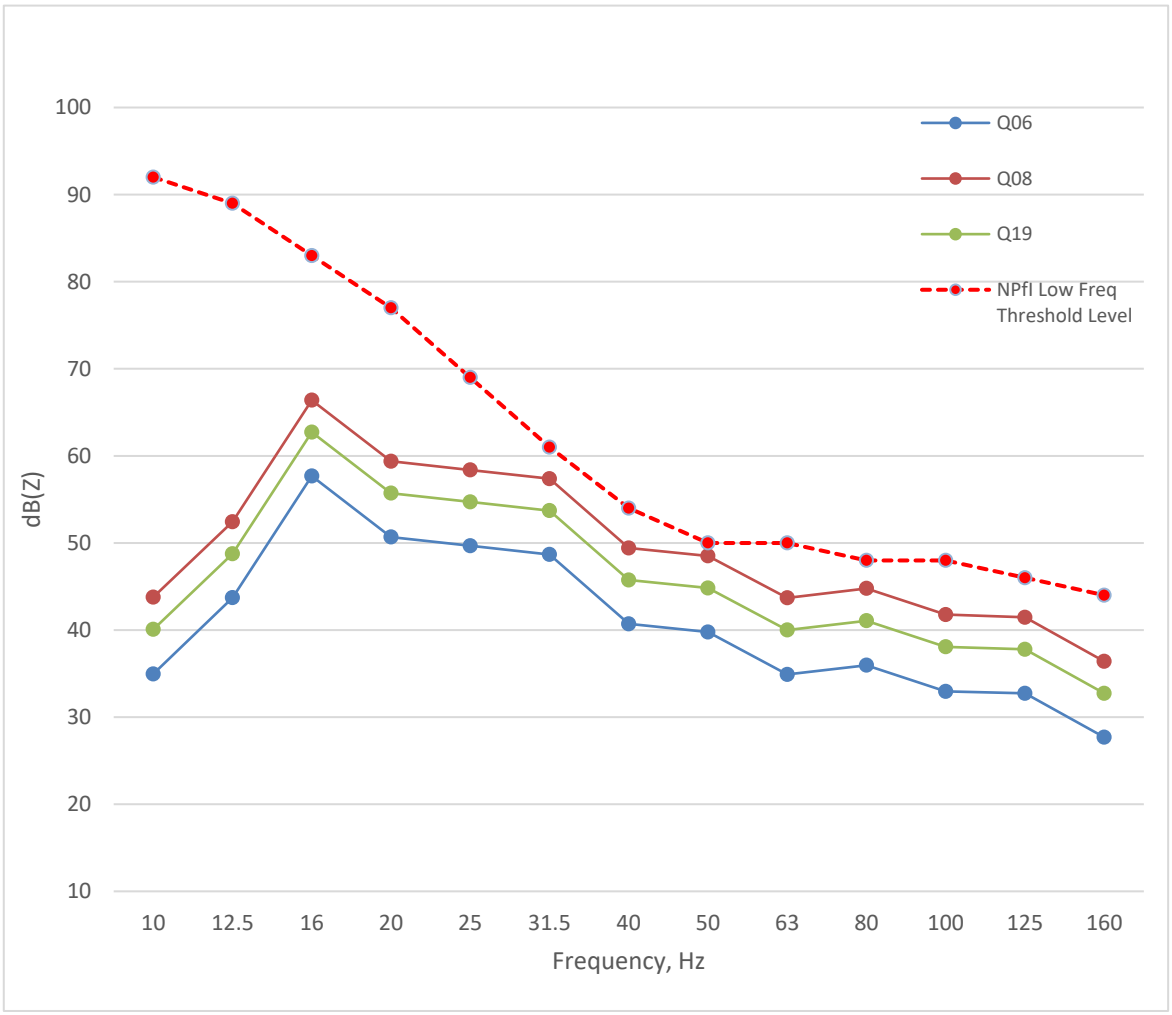


Figure B.7 – Operational Low Frequency Noise Spectra at the Modified Rail Siding



ATTACHMENT 4

CONSIDERATION OF BIODIVERSITY IMPACTS ASSOCIATED WITH THE MODIFIED ACCOMMODATION CAMP

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Rose-Anne Hawkeswood
Department of Planning, Industry and Environment
GPO Box 39
PARRAMATTA NSW 2150

29 September 2021

Re: Sunrise Project – Project Execution Plan Modification – Response to Biodiversity, Conservation and Science Directorate Submission

Dear Rose-Anne,

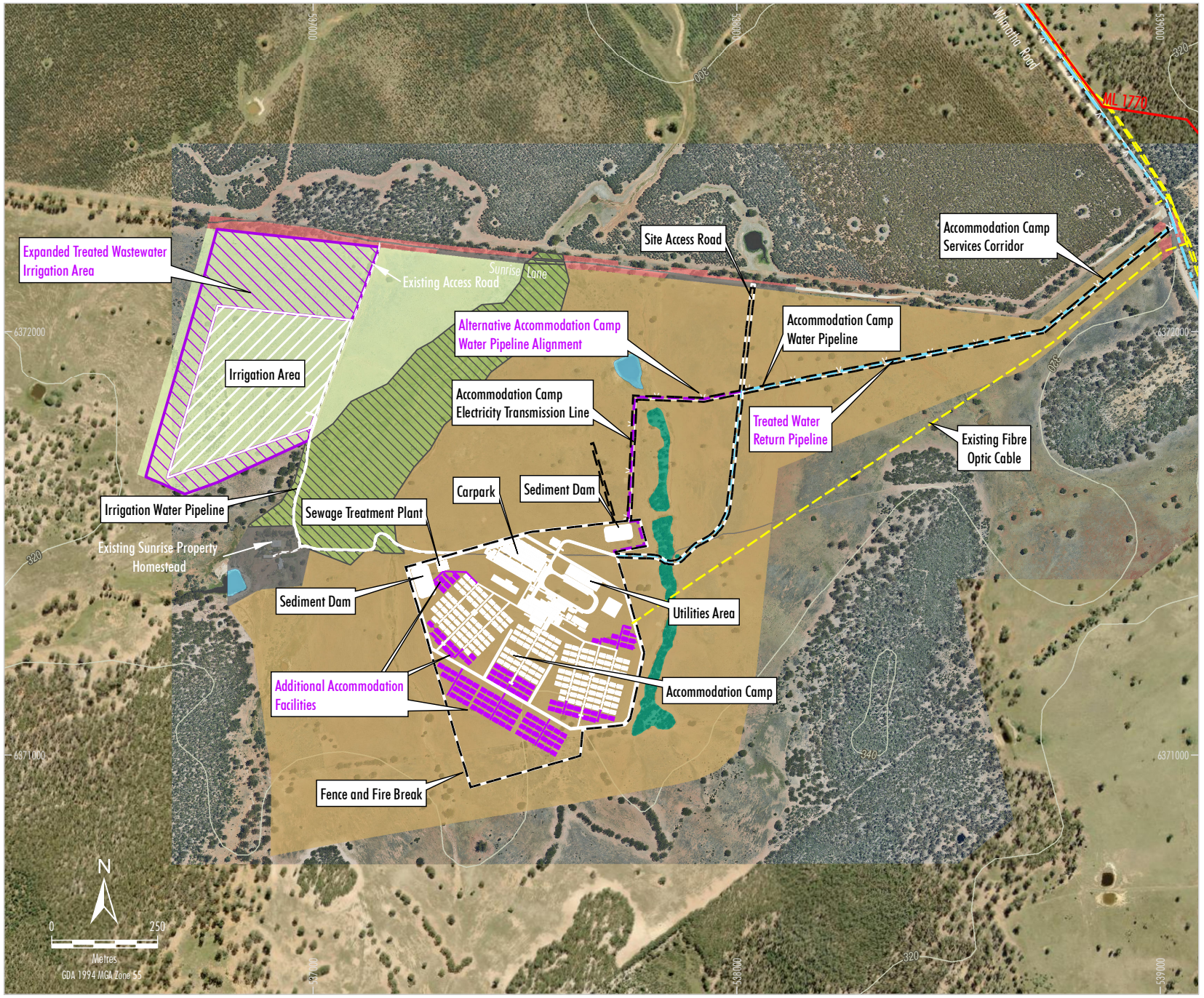
The Modification Report for the Sunrise Project – Project Execution Plan (PEP) Modification (the Modification) was placed on public exhibition by the Department of Planning, Industry and Environment (DPIE) from 27 July 2021 to 9 August 2021.

The Biodiversity, Conservation and Science Directorate (BCS) provided a submission on the Modification via letter on 10 August 2021 which requested additional information regarding the potential biodiversity impacts of the Modification. Specifically, the BCS requested additional information regarding the assessment of the potential impacts on biodiversity values associated with (Figure 1):

- the accommodation camp water pipeline alternative alignment; and
- the expanded treated wastewater irrigation area.

BCS separately suggested in an email dated 20 September 2021 that Sunrise Energy Metals Limited (SEM) assess whether the expanded irrigation area component of the modified accommodation camp would be located on "Category 1 – Exempt Land" as defined in the NSW *Local Land Services Act 2013* noting the *Biodiversity Assessment Method* (Department of Planning, Industry and Environment, 2020) (the BAM) under the NSW *Biodiversity Act 2016* does not apply to "Category 1 – Exempt Land". "Category 1 – Exempt Land" is generally land that has been previously cleared and has low conservation value.

Additional information regarding these matters is provided below.



LEGEND

Telstra Fibre Optic Cable

Approved Project

- Mining Lease Boundary (ML)
- Approved Surface Development Area
- Accommodation Camp Component
- Water Pipeline
- Electricity Transmission Line

Modified Project

- Accommodation Camp Component
- Alternative Water Pipeline Alignment

Plant Community

- Green Mallee, Mugga Ironbark Grey Box Woodland (PCT 217)
- Green Mallee Low Woodland (PCT 217)
- Previously cultivated land with advanced grassland/shrubland regeneration (PCT 217)
- Previously cultivated land with regrowth of predominantly native grasses, herbs and low shrubs (PCT 217)
- Low lying area with Derived Native Grassland (PCT 82)
- Cleared land/Non-native areas
- Dam

Threatened Ecological Community

- Derived Grassland form of the Grey Box Woodland EEC (BC Act and EPBC Act)

Source: Black Range Minerals (2000); Clean TeQ (2021); NSW Spatial Services (2020, 2021) Orthophoto: Clean TeQ (Oct 2018); Esri, DigitalGlobe (2017)

Note: The approved accommodation camp layout shown has been prepared in consultation with the LSC and approved by the Secretary of the DPIE on 3 June 2019.

sunrise energy metals

SUNRISE PROJECT

Approved and Modified Accommodation Camp Conceptual General Arrangement - Plant Community Type Mapping

Figure 1

CTL-20-08 MOD 7_SR_201B

Background

Clause 30A, sections 1(a) and 2(c) of the NSW *Biodiversity Conservation (Savings and Transitional) Regulation 2017* provide that a Biodiversity Development Assessment Report (BDAR) is not required if the determining authority for certain modification applications is satisfied that the modification would not increase impacts on biodiversity values. In the case of the Modification, the relevant determining authority is the DPIE.

The *Biodiversity Assessment Method*[1] (the BAM) defines impacts on biodiversity values as a "loss in biodiversity values from direct, indirect or prescribed impacts of development …".

Alternative Water Pipeline Alignment

BCS stated:

> *No discussion has been provided in the report regarding whether this alternative alignment would require the clearing of native vegetation. If this alignment option is progressed, and clearing of native vegetation is required, a BDAR may be required.*

The Modification would include the option for an alternative alignment of the last section of the accommodation camp water pipeline along the accommodation camp services corridor, rather than along the access road corridor (Figure 1). As the alternative alignment of the accommodation camp water pipeline would be wholly located within the approved surface development area, no additional native vegetation clearance (i.e. no additional direct impacts) would be required.

Table 1 provides an assessment of the impacts of the alternative alignment of the accommodation camp water pipeline on biodiversity values. In summary, the alternative alignment of the accommodation camp water pipeline would not result in a loss of vegetation abundance, vegetation integrity, habitat suitability, threatened species abundance, habitat connectivity, threatened species movement, flight path integrity or hydrological processes that are known to sustain a threatened species or ecological community.

As there would be no loss in biodiversity values, the alternative accommodation camp water pipeline alignment would not increase impacts on biodiversity values. Therefore, with reference to clause 30A, sections 1(a) and 2(c) of the NSW *Biodiversity Conservation (Savings and Transitional) Regulation 2017*, it is considered that a BDAR is not required for the alternative accommodation camp water pipeline.

[1] Department of Planning, Industry and Environment (2020) *Biodiversity Assessment Method*.

Table 1
Impacts of the Alternative Accommodation Camp Water Pipeline Alignment on Biodiversity Values

Biodiversity Value	Meaning	Relevant (✓ or N/A)	Explanation
Vegetation abundance *1.4(b) BC Regulation*	*Occurrence and abundance of vegetation at a particular site*	N/A	**The alternative accommodation camp water pipeline would not result in a loss of vegetation abundance.** The alternative accommodation camp water pipeline would not result in additional native vegetation clearance. Therefore, it would not result in a loss of vegetation abundance.
Vegetation integrity *1.5(2)(a) BC Act*	*Degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state*	N/A	**The alternative accommodation camp water pipeline would not result in a loss of vegetation integrity.** The alternative accommodation camp water pipeline would not result in additional native vegetation clearance. Therefore, it would not result in a loss of vegetation integrity.
Habitat suitability *1.5(2)(b) BC Act*	*Degree to which the habitat needs of threatened species are present at a particular site*	N/A	**The alternative accommodation camp water pipeline would not result in a loss of habitat suitability.** The alternative accommodation camp water pipeline would not result in additional native vegetation clearance. Therefore, it would not result in a loss of habitat suitability.
Threatened species abundance *1.4(a) BC Regulation*	*Occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular site*	N/A	**The alternative accommodation camp water pipeline would not result in a loss in the occurrence and abundance of threatened species, or their habitat, in the locality.** The alternative accommodation camp water pipeline would not result in additional native vegetation clearance. Therefore, it would not result in a loss in threatened species abundance.
Habitat connectivity *1.4(c) BC Regulation*	*Degree to which a particular site connects different areas of habitat of threatened species to facilitate the movement of those species across their range*	N/A	**The alternative accommodation camp water pipeline would not result in a loss of habitat connectivity.** The alternative accommodation camp water pipeline would not result in additional native vegetation clearance. Therefore, it would not result in a loss of habitat connectivity.
Threatened species movement *1.4(d) BC Regulation*	*Degree to which a particular site contributes to the movement of threatened species to maintain their lifecycle*	N/A	**The alternative accommodation camp water pipeline is not likely to result in a loss of a well-defined movement pattern for any particular species.**
Flight path integrity *1.4(e) BC Regulation*	*Degree to which the flight paths of protected animals over a particular site are free from interference*	N/A	**The alternative accommodation camp water pipeline would not interfere with any flight paths of protected animals.**
Water sustainability *1.4(f) BC Regulation*	*Degree to which water quality, water bodies and hydrological processes sustain threatened species and threatened ecological communities at a particular site*	N/A	**The alternative accommodation camp water pipeline would not result in a loss of water quality, water bodies or hydrological processes that are known to sustain a threatened species or threatened ecological community.**

Expanded Treated Wastewater Irrigation Area

BCS notes:

> *… No discussion has been provided in the report regarding whether the irrigation area is comprised of native or non-native vegetation, or the additional area (hectares) that will be impacted by the wastewater irrigation.*
>
> *Section 3.4.3 of the report states that irrigation of the wastewater will be undertaken in accordance with the Environmental Guidelines Use of Effluent by Irrigation. Section 4.10 of the guidelines state that separation distances and buffer zone management should be considered to ensure the protection of native vegetation. Therefore, the proponent should provide additional information to confirm whether native vegetation will be cleared to allow for the irrigation to occur, or whether native vegetation will be impacted by the irrigated wastewater. In either scenario, impacts to native vegetation should be assessed through the preparation of a BDAR.*

The Modification would increase the size of the treated wastewater irrigation area from approximately 10.5 hectares (ha) to approximately 21 ha (i.e. an approximate 10.5 ha increase) (Figure 1).

Both the approved and expanded treated wastewater irrigation areas would be located over previously cultivated land with advanced grassland/shrubland regeneration (PCT 217) (Vegetation Community 1c)[2] (Figure 1). Consistent with the approved treated wastewater irrigation area, no native vegetation clearance (i.e. no direct impacts) would however be required for the expanded treated wastewater irrigation area. The BAM only requires the determination of the biodiversity credits for residual direct impacts.

Irrigation of the treated wastewater at the modified accommodation camp would be undertaken in accordance with the *Environmental Guidelines Use of Effluent by Irrigation*[3] (the Irrigation Guideline). In consideration of the Irrigation Guideline, the following measures would be implemented at the modified accommodation camp:

- The wastewater (effluent) would be treated to a high level with primary (solid/liquid separation and anerobic treatment), secondary (aerobic treatment) and tertiary (including nutrient reduction and disinfection) treatment so that the treated wastewater would be:
  - "low strength effluent" as defined in the Irrigation Guideline; and
  - suitable for agricultural use including for use on crops.
- The irrigation system design (including low impact sprinklers) would evenly distribute the treated wastewater so as not to:
  - cause irrigation water runoff from the irrigation area; or
  - exceed the capacity of the soil in the irrigation area to effectively absorb the applied nutrient, salt, organic material and hydraulic loads.

[2] Resource Strategies Pty Ltd (2017) *Clean TeQ Sunrise Project Accommodation Camp Modification Biodiversity Development Assessment Report.*
[3] Department of Environment and Conservation (2004) *Environmental Guidelines Use of Effluent by Irrigation.*

- Detailed operational procedures would be developed for the treated wastewater irrigation area (including irrigation rates, frequency and timing; monitoring and reporting) to effectively manage potential impacts associated with the modified treated wastewater irrigation area.

Consistent with the requirements of the Irrigation Guideline, SEM would also incorporate suitable separation distances and buffer zone management strategies into the detailed design of the modified treated wastewater irrigation area. As the treated wastewater would be "low strength effluent", in accordance with the Irrigation Guideline, a site-specific separation distance would be developed for the modified treated wastewater irrigation area as part of the detailed design in consideration of the following:

- Sensitivity of the receiving environment – the expanded treated wastewater irrigation area is not considered to be a sensitive receiving environment as it has been significantly disturbed.

- Level of effluent treatment/Strength of the effluent – the wastewater (effluent) at the accommodation camp would be treated to a high level with primary, secondary and tertiary treatment so that the treated wastewater would be a "low strength effluent" suitable for use on cropping and would therefore present a low risk to native vegetation.

- Method of effluent application and irrigation management practices/Proposed impact mitigation strategies – irrigation would be undertaken in accordance with detailed operational procedures to effectively manage potential impacts associated with the modified treated wastewater irrigation area.

In addition, it is expected that an Approval issued under section 68 of the NSW *Local Government Act 1993* for the expanded treated wastewater irrigation area by the Lachlan Shire Council would include a condition similar to Condition 17 of the existing Approval for the approved treated wastewater irrigation area:

> *No wastewater associated with the on-site sewage management system is to be applied or irrigated within the drip line of any native trees within the effluent management area.*

Furthermore, the Surface Water Assessment[4] prepared for the Modification considered the potential surface water quality impacts associated with the expanded treated wastewater irrigation area and concluded that there would be a low risk of adverse water quality impacts on the adjacent surface water systems due to the expanded treated wastewater irrigation area.

Table 2 provides an assessment of the impacts of the expanded treated wastewater irrigation area on biodiversity values. In summary, the expanded treated wastewater irrigation area would not result in a loss of vegetation abundance, vegetation integrity, habitat suitability, threatened species abundance, habitat connectivity, threatened species movement, flight path integrity or hydrological processes that are known to sustain a threatened species or ecological community.

[4] Hydro Engineering & Consulting (2021) *Sunrise Project Project Execution Plan Modification Surface Water Assessment*.

Table 2
Impacts of the Expanded Treated Wastewater Irrigation Area on Biodiversity Values

Biodiversity Value	Meaning	Relevant (✓ or N/A)	Explanation
Vegetation abundance *1.4(b) BC Regulation*	*Occurrence and abundance of vegetation at a particular site*	✓	**The expanded treated wastewater irrigation area would not result in a loss of vegetation abundance.** The expanded treated wastewater irrigation area would not result in additional native vegetation clearance. In addition, the expanded treated wastewater irrigation area is unlikely to adversely impact the native vegetation because: • the wastewater (effluent) would be treated to a high level with primary, secondary and tertiary treatment; • the irrigation rate would not cause irrigation water runoff from the irrigation area; and • the irrigation rate would not exceed the capacity of the soil in the irrigation area to effectively absorb the applied nutrient, salt, organic material and hydraulic loads. It is also noted that the irrigation is likely to positively increase growth of the regenerating native vegetation and therefore its abundance in the expanded treated wastewater irrigation area. SEM would implement weed control measures in accordance with the Biodiversity Management Plan to minimise weed occurrence in the expanded treated water irrigation area. Therefore, the expanded treated wastewater irrigation area would not result in a loss of vegetation abundance.
Vegetation integrity *1.5(2)(a) BC Act*	*Degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state*	✓	**The expanded treated wastewater irrigation area would not result in a loss of vegetation integrity.** The expanded treated wastewater irrigation area would be located over previously cultivated land with advanced grassland/shrubland regeneration (PCT 217) (Vegetation Community 1c) and would not result in additional native vegetation clearance. In addition, the proposed irrigation is unlikely to adversely impact native vegetation (refer above).
Habitat suitability *1.5(2)(b) BC Act*	*Degree to which the habitat needs of threatened species are present at a particular site*	N/A	**The expanded treated wastewater irrigation area would not result in a loss of habitat suitability.** No threatened fauna species were recorded at either the approved or expanded wastewater treatment irrigation area. No threatened flora species were recorded at either the approved or expanded wastewater treatment irrigation area. The proposed irrigation is also unlikely to adversely impact native vegetation. The Modification has been designed to avoid impacts on habitat by locating the expanded treated wastewater irrigation area in previously cultivated land with advanced grassland/shrubland regeneration. The expanded treated wastewater irrigation area would not impact rocks, karst, caves, crevices, cliffs, human made structures or non-native vegetation known to be associated with any threatened species. The expanded treated wastewater irrigation area is unlikely to cause a greater impact on any adjacent habitat due to noise, dust or light spill.

Table 2 (Continued)
Impacts of the Expanded Treated Wastewater Irrigation Area on Biodiversity Values

Biodiversity Value	Meaning	Relevant (✓ or N/A)	Explanation
Threatened species abundance 1.4(a) BC Regulation	*Occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular site*	N/A	**The expanded treated wastewater irrigation area would not result in a loss in the occurrence and abundance of threatened species, or their habitat, in the locality.** The expanded treated wastewater irrigation area would not result in additional native vegetation clearance.
Habitat connectivity 1.4(c) BC Regulation	*Degree to which a particular site connects different areas of habitat of threatened species to facilitate the movement of those species across their range*	N/A	**The expanded treated wastewater irrigation area would not result in a loss of habitat connectivity.** The expanded treated wastewater irrigation area would not result in additional native vegetation clearance.
Threatened species movement 1.4(d) BC Regulation	*Degree to which a particular site contributes to the movement of threatened species to maintain their lifecycle*	N/A	**The expanded treated wastewater irrigation area is not likely to result in a loss of a well-defined movement pattern for any particular species.**
Flight path integrity 1.4(e) BC Regulation	*Degree to which the flight paths of protected animals over a particular site are free from interference*	N/A	**The expanded treated wastewater irrigation area would not interfere with any flight paths of protected animals.**
Water sustainability 1.4(f) BC Regulation	*Degree to which water quality, water bodies and hydrological processes sustain threatened species and threatened ecological communities at a particular site*	N/A	**The expanded treated wastewater irrigation area would not result in a loss of water quality, water bodies or hydrological processes that are known to sustain a threatened species or threatened ecological community.**

Based on the above, it is considered that the modified treated wastewater irrigation area is unlikely to result in a loss of biodiversity values. This conclusion is consistent with the outcomes of the BDAR[5] prepared for the approved accommodation camp and did not assign biodiversity credits for irrigation due to the way in which the irrigation would be conducted.

It is noted that the BCS (previously the Office of Environment and Heritage) accepted this conclusion in the BDAR in its submission dated 6 February 2018. The DPIE also concluded that no biodiversity offset would be required for the accommodation camp (including the treated wastewater irrigation area) in its assessment report for the approved accommodation camp.

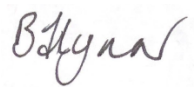
[5] Resource Strategies Pty Ltd (2017) *Clean TeQ Sunrise Project Accommodation Camp Modification Biodiversity Development Assessment Report.*

As there would be no loss in biodiversity values, the expanded treated wastewater irrigation area would not increase impacts on biodiversity values. Therefore, with reference to clause 30A, sections 1(a) and 2(c) of the NSW *Biodiversity Conservation (Savings and Transitional) Regulation 2017*, it is considered that a BDAR is not required for the expanded treated wastewater irrigation area.

Given the conclusions above, consideration of whether the expanded irrigation area component of the modified accommodation camp would be located on "Category 1 – Exempt Land" as defined in the NSW *Local Land Services Act 2013* is not considered necessary.

Please don't hesitate to contact me at the details below if you have any queries or wish to discuss.

Sincerely,



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