Andromeda METALS

MINOTAUR EXPLORATION

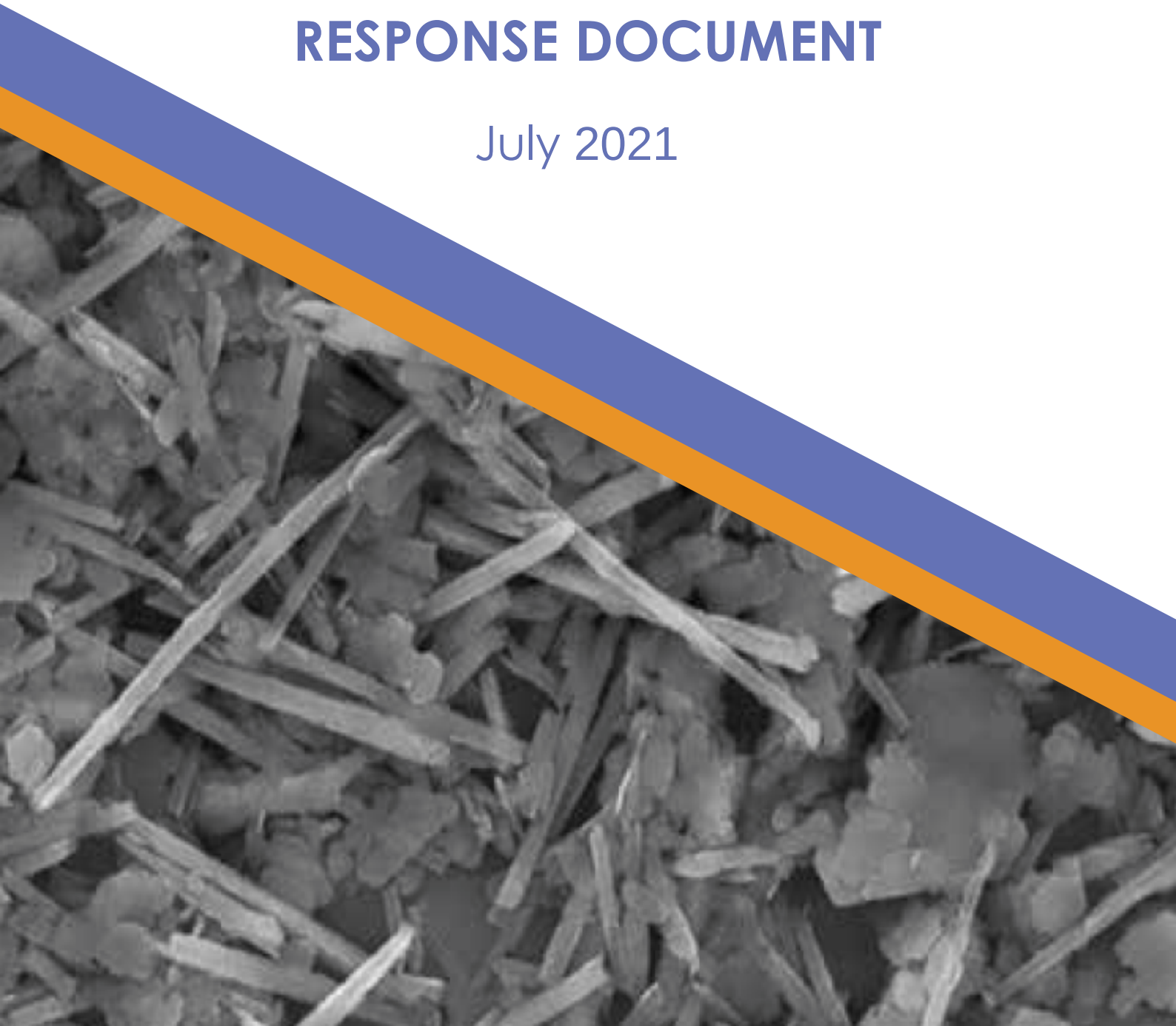
Great White Kaolin Project

Mining Proposal and Miscellaneous Purposes Licence Management Plans

Andromeda Industrial Minerals Limited | Great Southern Kaolin Pty Ltd

RESPONSE DOCUMENT

July 2021



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1 Introduction

1.1 Background

Andromeda Industrial Minerals Pty Ltd, a wholly owned subsidiary of Andromeda Metals Limited, together with Great Southern Kaolin Proprietary Limited (GSK), a wholly owned subsidiary of Minotaur Exploration Limited (Minotaur), are the holders of Mineral Claim (MC) 4510 and the proponents of a Mining Lease (ML) application and two Miscellaneous Purposes Licences Applications (MPL) (collectively 'the Application') in respect of the Great White Kaolin Project (the Project).

The Application was made in relation to a proposed kaolin mine, water pipeline and access road (the Proposed Development) approximately 21 km from the township of Poochera on the Eyre Peninsula and was submitted to the Department for Energy and Mining (DEM) on 26 February 2021.

The Application provides details of the environmental, social and economic components of the proposed Application and was prepared in compliance with the *Mining Act 1971* (Mining Act), *Mining Regulations 2020* (Mining Regulations) and Terms of Reference 006 (TOR006).

1.2 The Proposed Development

The Proposed Development is located near Poochera on the Eyre Highway about 635 km by road from Adelaide and 65 km east of Streaky Bay (Figure 1-1).

In March 2021, the DEM published the Application and invited written submissions from the public. Closing date for submissions was 29 April 2021.

A total of 16 submissions were received from the public, including from landholders (directly and indirectly impacted), members of the local community, local businesses and the District Council of Streaky Bay (DCSB). In addition, government agencies provided the proponents with a request for further information to support the Application, including the DEM, the Department for Environment and Water (DEW) and the Environment Protection Authority (EPA).

This Response Document has been prepared in order to address each of the matters raised in the submissions (refer Table 3-2 (public and DCSB), Table 3-3 (DEM), Table 3-4 (DEW) and Table 3-5 (EPA)).

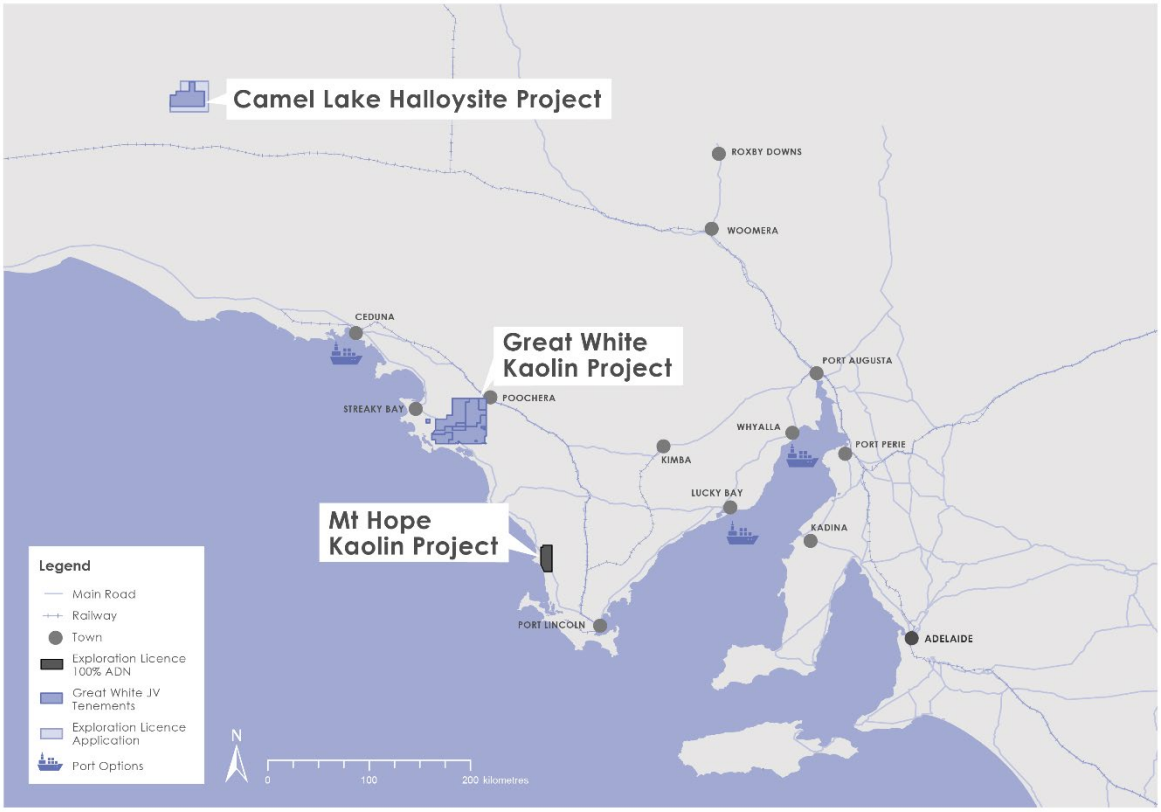


Figure 1-1 Project location map

1.3 Terminology

To simplify the narrative in this Response Document, the term 'the Applicant' or 'the Company' will be used to refer to any one or more of, or collectively to all, Andromeda or Minotaur and their subsidiaries, in their respective capacities and as the case requires. The proposed ML and MPLs are collectively referred to as 'the Proposed Development' and the documents submitted on 26 February 2021 for public consultation are collectively referred to as 'the Application'.

1.4 Declaration

In accordance with Regulation 84 of the *Mining Regulations 2020*:

I, **James Marsh**, Managing Director of Andromeda Metals Limited (ACN 061 503 375) and Director of Andromeda Industrial Minerals Pty Ltd (ACN 628 055 925), both of 69 King William Road, UNLEY, South Australia 5061, have taken reasonable steps to review the information provided in this Response Document to ensure its accuracy, including an internal process for review, endorsement or sign-off by senior management.

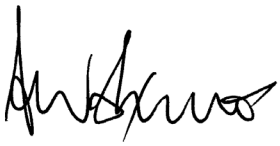
Signature: 

Name: James Marsh

Position Managing Director

Date: 14 July 2021

I, **Andrew Woskett**, Managing Director of Minotaur Exploration Ltd (ACN 108 483 601) and Director of Great Southern Kaolin Pty Ltd (ACN 133 520 180), both of Level 1, 8 Beulah Road, NORWOOD, South Australia 5067, have taken reasonable steps to review the information provided in this Response Document to ensure its accuracy, including an internal process for review, endorsement or sign-off by senior management.

Signature: 

Name: Andrew Woskett

Position Managing Director

Date: 14 July 2021

2 Changes to Mining Proposal and Miscellaneous Purposes License Management Plans

There have been no material changes to the Proposed Development, as described in the Mining Proposal and Management Plans. Some submissions have questions regarding occasional typing errors, where this has occurred the issue has been clarified in response to the question/concern raised.

It is noted that the Company is currently finalising the Definitive Feasibility Study for this Project, and this may result in some minor updates to the Project in the second part of 2021. Where this is the case, the Company will work with DEM to ensure all aspects of the Proposed Development are appropriately described, assessed and approved prior to construction.

3 Responses to Submissions

A total of 15 submissions were received as a result of the public consultation process. Of the total submissions received, 10 were identified to be in support of the Proposed Development. Across the 10 submissions, the general consensus is that the Proposed Development will result in improved local employment opportunities, an increase in the local population, increased support of local and regional businesses, growth of the local and state economy and the potential for increased investment in local infrastructure and facilities such as roads, medical services, and other general support service facilities.

Five of the 15 submissions raised questions, concerns and sought clarification about the Proposed Development. Several of those submissions are generally supportive of the Proposed Development and as such do not require a response except where specific questions are asked.

Table 3-2 sets out the Company responses to all relevant matters raised in these submissions. Where similar questions have been asked, they are responded to in the first instance the question is raised, with all subsequent, similar questions being referred back to the initial query and response in order to minimise repetition.

For context, mining applications go through a two-stage process before construction and operations can begin:

1. Assessment and grant of a mineral tenement (Mining Lease (ML) or Miscellaneous Purposes Licence (MPL)).
    a. The ML (with any associated MPL) application must be supported by a Mining Proposal (MP) (inclusive of associated MPL management plans) and include prescribed information. This includes outlining the achievability of the potential mining operation to operate in accordance with proposed environmental and social outcomes, as developed during stakeholder engagement, technical, environmental and social studies. The proposed outcomes address the identified and acceptable level of impact as a commitment by the Company. The MP is more conceptual as compared to the second stage of the mining application, the Program for Environment Protection and Rehabilitation (PEPR). This Response Document is part of the ML application process.
2. Assessment and approval of a PEPR, which will allow operations to commence. The PEPR is more detailed than the MP and details the mining operation and control measures in more specific terms, and includes specific monitoring and measurement criteria that the proposed development must comply with.

This is a relevant note as many submissions are requesting detail which has not yet been finalised and will be completed as part of the PEPR.

The Applicant commits to ongoing and regular engagement with all key stakeholders during the future stages of the Project, should it be approved. Further, if the ML and MPLs are granted, a PEPR must be developed by the Applicant and approved by the Director of Mines prior to any works commencing on site. Development of the PEPR will be undertaken in consultation with stakeholders.

3.1 Project Team

The responses set out in this document have been prepared by the Project Team, and specialist technical experts, as detailed in Table 3-1.

Table 3-1 Project Team

Name	Role	Andromeda
James Marsh	Managing Director	Andromeda Industrial Minerals Pty Ltd
Joe Ranford	Operations Director	Andromeda Industrial Minerals Pty Ltd
Eric Whittaker	Chief Geologist	Andromeda Industrial Minerals Pty Ltd
Darren Klingner	Manager – Project Development	Andromeda Industrial Minerals Pty Ltd
Conan Mills	Community Engagement and Exploration Field Officer	Andromeda Industrial Minerals Pty Ltd
Steve Green	Executive Director	JBS&G Australia Pty Ltd
Katy Fechner	State Lead, Associate, Assessments and Approvals	JBS&G Australia Pty Ltd
Laura Johnston	Associate, Assessments and Approvals	JBS&G Australia Pty Ltd
Georgie Stewart	Project Scientist	JBS&G Australia Pty Ltd
Roberta Magoba	Project Scientist	JBS&G Australia Pty Ltd
Rick Aldam	Principal Hydrogeologist	Aldam Geoscience
Nick Henrys	Senior Acoustic Consultant	Resonate Consultants

3.2 Response Tables

The Applicant's responses to all relevant matters raised in the public submissions (including from the DCSB) received during the public consultation process are provided in Table 3-2, except for specific questions relating to potential dust impacts to crops and stock which have been addressed in Appendix B.

Responses to the submissions received from the public and government agencies are provided in Table 3-2 (public and DCSB), Table 3-3 (DEM), Table 3-4 (DEW) and Table 3-5 (EPA).

Table 3-2 Responses to public submissions & the District Council of Streaky Bay

Item #	MP Section #	Chapter Name	Issue	Concerns/ Questions / Benefits/ Further Information Requested	The Company's Response
Rate Payers and Business Owners					
1. The Hull family			Traffic and Transport	**1.1** The number of trucks increasing on the Poochera-Port Kenny road from a current 2-3 on a day during any day other than seeding and harvest period, to a staggering one every 10 minutes, and claiming an overall increase of <1%. This same road is used every morning and afternoon by a local school bus. **1.2** Terms that we see for this mine to go ahead for the community to be safe and productive as it is today; • Bituminise the Poochera-Port Kenny Road from Streaky Bay Road as far south as Tootla Road. • Liaise with Streaky Bay Council for the widening of the shoulders where school buses use the existing bitumen road along the Streaky Bay to Poochera Road. • Usage of the roads during school bus periods is not allowed, this must also be monitored. • If a primary producer's vehicle is on the road and a vehicle must give way, it be the mining vehicle that is to give way. **1.3** We have not seen any information about the safety for stock on roads used by haulage trucks etc. Could we please see some information on how these circumstances would be handled? **1.4** Another issue would be large seeders and sprayers sharing the road with such big heavy trucks, as well as the number of "farmers" trucks that would be on the same road at harvest time. **1.5** We also have concerns for the users of the Eyre Highway, the highway is a very busy road with numerous types of vehicles doing predominately one speed. What speed would the haulage trucks using the highway be capable of by law?	**1.1 HV frequency** The Company acknowledges that traffic volumes on the Poochera-Port Kenny Road are currently low outside of seeding and harvest periods. One HV every 10 minutes was calculated to be: – 24 loads of ore per day and 4 deliveries, equating to 56 heavy vehicles entering and leaving the ML per day. On a 7am – 7pm, schedule (12 hours), removing 2 hours (8-9am, and 3-4pm) for school buses to access the site, that leaves 10 hours in the day in which to load ore and receive deliveries. 56 movements, averaged over 10 hours, results in 5.6 HV movements per hour. Traffic counts were available for the Poochera-Port Kenny Road from 21 August to 28 November 2019 and indicated some 3,196 vehicles were counted over this period, of which 17.8% (or 569 vehicles) were heavy vehicles. This equates to an average of 35 vehicles per day, acknowledging that this time period does not cover harvest or seeding. The 1% increase is an increase calculated over the entirety of the proposed haulage routes, that is, from mine gate to a port (either Thevenard, Lucky Bay or Whyalla). **1.2 Sealing of Poochera-Port Kenny Road / road upgrades / heavy vehicle interactions** The Company is not currently proposing to seal the Poochera-Port Kenny Road under advice from civil contractors and haulage companies. It is proposed to upgrade the existing unsealed road to a safe design and maintain the road in a serviceable condition while the road is new and being further compacted by the mine traffic. This provides the ability to maintain the road to prevent rutting, which would be unrepairable if the road was initially sealed. It is proposed that a maintained unsealed road is a better solution for the early stages of the Project. The council road has been assessed in relation to relevant unsealed road design criteria (ARRB Unsealed Roads Manual – Guidelines to Good Practice (2009); Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections). The road currently does not meet the required design specifications for road curvature or crest angle. A redesign has been undertaken by Tonkin Consulting to realign the vertical and horizontal alignment to meet the requisite specifications of the ARRB Unsealed Roads Manual. This work is being reviewed by the DCSB and provides for a substantial increase in the safety standard of the road. The DCSB have been apprised of the approach to upgrade the Poochera-Port Kenny Road being unsealed initially, with sealing to be investigated as the Proposed Development Progresses and the road surface settles (26th May 2021). The Company has committed to funding the road upgrades, as well as ongoing maintenance, including upgrades to Poochera-Port Kenny Road and the intersection with Streaky Bay Road. Upgraded designs for the intersection have been provided to the Department for Infrastructure and Transport for review and approval. The Company is also working with DCSB on the required road upgrades and committed to the implementation of pavement monitoring management and rehabilitation procedures if required (Section 8.3.1, Table 8-1 of the MP). Dust suppression including binding agents and water trucks will be used as necessary on the upgraded Poochera-Port Kenny Road. The Company will continue to fund and work with the DCSB to maintain the Poochera-Port Kenny Road throughout the Life of Mine to a safe and operable standard and ensure upgrades will make the route safer for public use and the wider community with the intention of making it suitable for the operation of heavy vehicles. This

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					includes working with DCSB regarding road maintenance programs and any associated road closures which may be required. Like all road users, all traffic associated with the Project must comply with the law to ensure safe operation of vehicles and equipment. This includes any interactions with slow moving vehicles, local farm traffic and oversized machinery such as harvest heavy vehicles. **1.2 School bus exemption** The Company understands the community's concerns around the safety of heavy vehicles and the interaction of public vehicles. In response to community feedback, the Company is committed to halting haulage trucks along the Poochera-Port Kenny Road during the time of school bus runs. The Company has also committed to liaising with local schools to discuss any impacts to school bus routes due to road closures or traffic movements (Section 8.3.2, Table 8-1). The Company is committed to working with the community to remove the concern regarding school bus safety. On approval, the Proposed Development site will be managed through an Environmental Management Plan (EMP). As part of the EMP, numerous internal policy and procedural documents are developed to achieve the expected outcomes. The operation of haulage vehicles will be managed in line with these documents. Reporting against environmental conditions (including haulage vehicle times) will be reported quarterly in the site's Quarterly Environmental Report and consolidated annually in the Annual Compliance Report. During operations, the Company will be available for community input and will promote the reporting of any undesirable practices observed. A complaints hotline, community engagement register, community issues register and a complaints register will be established to collect information and investigate any non-compliance. Complaints will be reported within the ML's public annual compliance reporting, which are released publicly. **1.3 Stock on Roads** The Company wants to work with the local landholders located along the Poochera-Port Kenny Road to ensure operations are safe at all times, to people as well as stock. As with any stock movements on public roads it is the responsibility of the owner to ensure that stock movements are sign posted and safe for other road users. Any vehicles on the road will be responsible for driving to conditions. Landholders will be able to call the mine and advise if stock needs to cross or travel along the road. If notified the Company can work with the stockholders individually on a case-by-case basis to ensure the safety of associated people and stock. At present, any stock movements across the road are subject to existing traffic, including heavy vehicles, and have been able to navigate this to date using signage, and traffic management as required. **1.4 Heavy vehicle interaction with farm traffic and oversized machinery** Addressed in 1.2 above and 1.5 below. **1.5 Speed limits** Speed restrictions apply to specific HVs under the Performance Based Standards Scheme – Network Classification Guidelines (the PBS Guidelines) or under council HV limits. HVs associated with the Proposed Development product haulage will be subjected to the general PBS Guideline speed limit restrictions of 90 km/hr, except on the Eyre Highway (west of Port Augusta) and the Stuart Highway, where a PBS Guideline speed limit of 100 km/hr applies. Along the Poochera-Port Kenny Road, a 70 km/hr council speed limit applies. The proposed haulage route covers

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					approximately one fifth of the total length of Poochera-Port Kenny Road and any additional speed limit restrictions imposed as a result of Council speed limit requirements will have limited impact on local traffic and travel times.
2. The Hull family	Section 12.3.2	Chapter 12 Air Quality	Table 12-1	**2.1** Dust suppression on all other roads/roadways that are in use.	**2.1** The Company has committed to applying dust suppression on all unsealed roads, as necessary to control the dust generated on the roads used as part of the Proposed Development (Section 12.3.2, Table 12-1).
3. The Hull family			Groundwater	**3.1** the allocation of 10 litres/second would have dramatic impacts on not only the local community but would be very likely to affect the township of Streaky Bay and abroad. **3.2** Spring/Summer/Autumn/Winter monitoring of pressure/flow of the SA water infrastructure in the local area be monitored prior to the mine being connected to the line.	**3.1** SA Water and the Company are committed to no adverse impacts to water supply or pressure of existing users as a result of the Company's water requirement. The proposed water supply solution includes the connection to the Tod Main supply in Poochera. Local supply issues and concerns relate to the existing infrastructure supplying Streaky Bay and Inkster Road, which are insufficient for the increased demand in the region. The Proposed development for water supply includes the installation of an additional supply line to the Poochera-Port Kenny Road intersection. With the supply to the mine, the new line will provide additional water supply capacity for use by existing users from that point. SA Water have responded to questions raised regarding water supply and reliability, this has been included in Appendix A. Also, see Submission ID 6.1. SA Water have guaranteed supply to all existing users and to being able to supply the mine. Andromeda would become a customer on the network and subject to the same rights and obligations as all other water users. **3.2** The Company will recommend SA Water undertake this work.
4. C. Tomney via DCSB (as an individual and as spokesperson for the Inkster community group	Chapter 2	Existing Environmental	Stakeholder Engagement	**4.1** Andromeda has identified nine immediate landholders affected by their mining proposal. The level of engagement is listed as high for this group of Key Stakeholders. Excluding mine landholders, the level of engagement has been very close to zero since early October 2020.	**4.1** The Company has been engaging with the local community since 2018. Engagement is respectful with the intent of listening for issues and concerns from the community. Specific community information sessions/drop-in days for stakeholders to find out more about the Proposed Development / the Application were held on: • 12th October 2020 at Poochera • 13th October 2020 at Streaky Bay • 2nd February 2021 at Poochera • 3rd February 2021 at Streaky Bay The community sessions/drop-in days were advertised through the local media, direct email to stakeholders (with focus on immediate landowners), interested local businesses through DCSB business email distribution, posters on community notice boards, social media and articles in community newsletters, inviting anyone with an interest in the Proposed Development to attend. Drop-in days were open from 11 am in the morning to 8pm at night to provide for all working shifts and flexibility around individual commitments. During the preparation of the Application, the Company recorded 311 unique interactions with stakeholders. Contact with 'mine' landholders is necessarily higher, as this includes land access negotiations and agreements. The Company ensures all immediate landowners receive the same information at the same time excluding details which are unique to the landowner. The Company remains committed to continuing open and transparent discussions with stakeholders throughout all phases of the Project, including development of the PEPR.

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5. C. Tomney via DCSB (as an individual and as spokesperson for the Inkster community group			Traffic and Transport	**5.1** All indicated haul routes include the Poochera/Pt Kenny Rd. At no stage does the proposal indicate that the above mentioned road be sealed. The group feels very strongly that the haul route should be sealed, including widening of the shoulder on the Streaky Bay Road to Poochera. Concerns were also raised about the use of council funds to upkeep the gravel road. **5.2** The groups concerns include • Failure to comply with School bus exemption • Dust • Slow moving vehicles (60 to 70 k/h) • All Weather capability • Extended road closures for maintenance • Farmer oversize machinery transport • Harvest HV traffic.	Refer to Submission ID 1.1 and 1.2.
6. C. Tomney via DCSB (as an individual and as spokesperson for the Inkster community group	Sections 3.7.3, 3.7.4 and Chapter 17	Chapter 3 Description of the Proposed Development, Chapter 17 Social Environment	Water supply and pressure / groundwater	**6.1** In different parts of the document SA Water state both that; • Andromeda's proposal should only have a minor impact on supply and pressures in the region. • Water supply would be subject to ensure water supply pressures existing customers is not impacted. The group would like a little more commitment from SA Water to confirm that their current supply and pressure will be unaffected. **6.2** Groundwater concerns include • Dropping of water level • Supply • Salinity increase	**6.1 SA Water mains supply** Water supply information and potential for impact was included in Sections 3.7.3, 3.7.4, and Chapter 17 of the MP. Both the Company and SA Water have a commitment to ensure water supply and pressure in the region to all existing users. The Company would become a customer of SA Water, as all other residents and business owners in the region. To date, SA Water have indicated that water supply for the mine is able to meet mine demand, and not impact existing users supply or water pressure. The Company will source water for the Project from the trunk main at Poochera by duplicating the existing infrastructure along Streaky Bay Road to the Poochera-Port Kenny Road. The Company will pay for the existing supply line to be supplemented with a parallel pipe (larger in diameter than the existing infrastructure) to the Poochera-Port Kenny Road offtake. Water supply for the Project will be taken at this point while still providing additional capacity available for Streaky Bay and the existing Inkster water users. A dedicated water pipeline has been designed for the Project and will connect to the duplicate pipe and will be installed in the Poochera-Port Kenny Road reserve, from Streaky Bay Road to site. This is currently in engineering and design phase with SA Water to ensure that no existing users are adversely impacted. SA Water have responded to questions raised regarding water supply and reliability, this has been included in Appendix A. **6.2 Groundwater** Groundwater existing environment and potential impact was included in Sections 2.6 and Chapter 11 of the MP. The Company has undertaken significant groundwater investigation well drilling and hydrogeological studies to understand the existing groundwater environment, and the ways in which the Proposed Development may interact with the existing groundwater environment. In essence the Proposed Development is classified as a dry mine and the region has no substantial groundwater systems utilised for other developments. Limited perched water tables are

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					accessed by agricultural businesses for use which will not be affected by the Proposed Development. A desktop groundwater (hydrogeology) assessment was completed by Aldam Geoscience in April 2020 and a numerical groundwater model was constructed in May 2020. Additional work was undertaken in July and August 2020 to ground truth desktop studies and gather additional hydrogeological data through installation of seven groundwater monitoring wells (MP: Appendix J Summary Groundwater Investigation Report). In July 2020, ground-truthing activities were undertaken with Aldam Geoscience, the Company, and local landowners. The aim of the ground-truthing activities was to identify all wells listed within the WaterConnect database, and any others that may exist. Of the wells listed within the WaterConnect Database, all but five were located. The wells not located were considered to not be present and hence have zero groundwater usage. All but two wells, including those identified by a local landowner, were not operational. The two wells that are operational are situated approximately 4 km south of the Proposed ML on a homestead. They include a windmill equipped well and a well with a solar pump. Both are used for stock watering purposes. The groundwater model extends 8 km east west and 6 km north south. The model was configured with three layers, namely: • Layer 1: Garford Formation (unconfined aquifer). • Layer 2: Kaolinised granite (aquitard layer which can be confined/unconfined). • Layer 3: Partially decomposed granite (PDG) - granite basement (confined/unconfined aquifer). With regard to drawdowns induced by pit dewatering on completion of mining after 26 years, the modelling indicates that: • Drawdown of up to 0.1 m within the Garford Formation generally extend to ~2 km from the pit in areas where the Garford Formation is saturated. • Close to the pit, the drawdown area within the kaolinised granite is very steep with drawdown up to 0.1 m extending to ~3 km from the pit in areas where the Kaolinised Granite is saturated. • A broad and shallow area of drawdown of up to 0.1 m at ~2-3 km from the pit is induced within the granite basement due to upward leakage induced by pit dewatering. Given the predictions, there is no expected impact to any existing groundwater users. Regarding salinity - a drawdown of less than 0.1 m at the southern edge of the model domain indicates that drawdown at 5832-859 and 5832-167 will be even less. Total drain flows (pit inflows also known as dewatering) are modelled to be less than 1 L/s (Fig 59 of MP Appendix J – groundwater summary report). Any drawdown in 5832-859 and 5832-167 attributable to dewatering at Great White will almost certainly be less than the drawdown occurring in their wells due to pumping. Salinity impacts due to such drawdown are expected to be negligible.
7. C. Tomney via DCSB (as an individual and as spokesperson for the Inkster community group	Chapter 12	Chapter 12 Air Quality	Air Quality	**7.1** Andromeda has committed to undertake air quality monitoring by measuring and monitoring dust around the perimeter of project as required. Dust will not only affect the perimeter of the mine area. Support was gained for an expanded dust monitoring programme to include a greater diameter.	**7.1** Air quality monitoring will be undertaken both within and surrounding the ML, to ensure the background and surrounding air quality as well air quality within the ML is being monitored. Air quality monitoring locations will be determined through the PEPR stage, however, will include control data (offsite) locations as well as on-site locations. The Company will continue to provide information as requested on air quality, dust and noise.

Item #	MP Section #	Chapter Name	Issue	Concerns/ Questions / Benefits/ Further Information Requested	The Company's Response
					See Appendix K of the MP. More specifically, air quality modelling undertaken for the Proposed Development has concluded that any change to air quality will be well within all legislative air quality criteria throughout construction and operation of the mine. This includes respirable particles, silica and nitrogen dioxide. Tables 12-9 to 12-15 inclusive in the MP outline the maximum predicted impact for a range of air quality indicators and a percentage of the Project's impact as compared to the applicable criteria.
8. M. Carey via DCSB	Chapters 12 and 13	Chapter 12 Air Quality, Chapter 13 Noise and Vibration	Air Quality and, Noise and Vibration	**8.1** We feel the dust and noise studies haven't come to any substance to give us clarity of what it will be like to live close to this mine. This includes dust collecting on our roof/gutters, dust affecting adjoining paddocks including crops and stock. **8.2** The dust and noise will obviously change the environment we live in. The dust particles includes silica and nitrous dioxide. The health impacts of dust created by the mine have not been explained to us. **8.3** They will be using explosives for Blasting this may have an unknown impact on our buildings and livestock. Their blasting documentation is inconsistent in details on frequency (from every day to every 3 months). The impact of blasting to underground water is unknown.	**Air quality monitoring** **8.1 and 8.2** The Company will continue to provide information as requested on air quality, dust and noise. See Appendix K of the MP. The Company has undertaken modelling for air quality and has concluded that any change to air quality is within all regulatory air quality criteria throughout construction and operation of the mine. This includes respirable particles, silica and nitrogen dioxide. Tables 12-9 to 12-15 in the MP outline the maximum predicted impact for a range of air quality indicators and a percentage of the Proposed Development's impact as compared to the applicable criteria. The mandatory limit for silica dust exposure in Australia is 0.05mg/m^3 averaged over an eight-hour day (except in Tasmania where it is 0.1mg/m^3, the maximum legislated 3-minute average silica concentration is 0.000360 mg/m^3). The conservative modelling undertaken specifically identifying sources associated with the Proposed Development through construction and operations, indicates the level of silica is expected to be approximately 53% of the applicable legislative criteria during stage 1, and reduced to 35% during stage 2 onwards. Dust collecting on roofs and gutters will be very similar to the dust generated by farming operations and typically indistinguishable in chemical composition. As with dust carried through the air from erosion which lands on roofs and gutters, the dust particles will be washed off during rain events. Additionally, the legislated criteria for nitrogen dioxide (NO_2) is a maximum 1-hour average NO_2 concentration (µg·m-3) and annual average NO_2 concentration (µg·m-3). Nitrogen dioxide is emitted as part of the processing operation (Stage 2), not mining, and predicted to be ~10% of the relevant criteria over 1 hour (of which the process plant is attributable for 2.1% of the criteria as compared to background sources). This reduces to 5% of the relevant criteria over the annual average, of which the process plant is attributable for 0.1% of the criteria as compared to background sources). **Impact of dust on crops and stock** The dust limits that Andromeda have proposed for the project are PM_{10} – 50 um/m^3 per 24 hrs (0.0015 gm/month) or Total Dust Deposited (4 g/m^2 month) (30 days).

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					The topsoil, subsoil and overburden that is proposed to be disturbed during the life of mine are inert and produce the same type of dust that is produced by the surrounding farming activities. The kaolin dust that may be produced by the mining operation is inert. Research has identified kaolin dust spraying to have positive benefits in agriculture through the prevention of pests and disease in food crops, improved nutritional values of grain yield of wheat and reduced water stress/improved transpiration resistance in wheat, citrus, and grapes (Abdallah, El-Bassiouny and AbouSeeda 2019; De Smedt, Steppe and Spanoghe, 2017; Moreshet, Stanhill and Fuchs 1977). Further, a study conducted by Al-Hazmi (2000) examining the effect of soil dusting on grapevines indicated no statistical difference in photosynthetic rates where dusting with soil was applied as a form of organic fungicide. More information regarding dust impacts and crops and stock has been prepared and included in Appendix B.
9. M. Carey via DCSB	Chapter 8	Chapter 8 Traffic	Port Kenny Road	**9.1** On a number of occasions in meetings they have said they would be doing bitumen along Port Kenny Road to the mine entrance. In the LMA there is nothing mentioned about this. We would like some feedback from council in regard to what they were told about road sealing?	**9.1 <u>Council presentations</u>** The Company presented to DCSB on a number of occasions and included various discussions on required road upgrades. The Company has committed to fund required road and intersection upgrades and maintenance the roads in a safe and stable form over the life the Proposed Development.
10. M. Carey via DCSB	Section 3.10.1 Sections 17.7.2 and 17.7.3	Description of Proposed Development / Social Environment	Employment	**10.1** Andromeda has indicated a lot of local employment opportunities from the mine development but from reading the proposal, the machinery requirements and mine operation details, it seems the indication of local jobs (76) is very optimistic. A lot of the employment will be for truck drivers and we see these positions being taken up by contractors who will live elsewhere.	**10.1 <u>Workforce</u>** When considering the required workforce for the Proposed Development the Company decided that it would develop the project as a residential operation. This means that once the project is in operation, the employees are residing (with their families if they have them) proximal to the site. To clarify, this means that the Company will not be building a camp and bringing people to live onsite. At peak, the Proposed Development will employ at least 75 fulltime equivalent (FTE) roles, through direct employment and permanent contractors, expected to be secured from local and regional communities. These direct jobs cover various disciplines including: TECHNICAL • engineers • geologists • surveyors. • environmental scientists OTHER DISCIPLINES • equipment operators • processing plant controllers • fixed and mobile plant • maintenance personnel • geological assistants • drillers • administration staff. Additionally, during mine operations contractors will be required for: • cleaning • haulage • supply of fuels and lubricants • general consumable supplies (hardware, etc.)

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					• transport and delivery. The Company acknowledges that the drivers could be based at Whyalla, Thevenard or Lucky Bay if appropriate. However, the Company remains committed to employing locally wherever possible and practical. As with all new businesses in a region it is unlikely that there will be an immediate workforce waiting and available. It is the intention of the company to employ locally where possible and attract new people to the area. It may be the case that some truck drivers choose to live at other locations along the haulage route but these individuals are considered to be local to the project area and will still reside on Eyre Peninsula.
11. M. Carey via DCSB	Chapter 3	Chapter 3 Description of the Proposed Development	Mine size	**11.1** We have no assurances that the mine will be limited to only this parcel of land. As this mine has developed so has the size of land they wish to acquire and there is no guarantee further land acquisitions will not be required in the future.	**11.1** In order to satisfy the requirements of the Mining Act 1971, a company looking to develop any mineral based project must ensure that it is effectively and efficiently mined. This means the prospective developer must understand the quality, quantity and geographic extents of the geological deposit. During the period in which the Company has built up the required confidence in the Great White Deposit it has communicated its intentions with the landholders along the way. Five different project layouts and associated areas have been exposed to the landholders and at each discussion, landholders comments have been taken into account to inform the subsequent design. The Company has undertaken numerous drilling programs over the years which has resulted in a greater understanding of the extent of the orebody. The work conducted has also enabled the Company to define the area required for mining and processing operations, which guided the MP. Every attempt has been made to reduce the project area to minimise the impact on the existing landholder, however the area is ultimately determined by the underlying geological conditions. As confirmed by the Company in a meeting with the landholders on 2 February 2021, the Great White exploration drilling would be constrained to the current ML area. The extent of the Project's mineralisation is shown in Figure 3.3 of the MP. All communications with the landholders have been undertaken in good faith. Any subsequent drilling would need a Waiver of Exemption as per standard Mining Act procedures.
12. M. Carey via DCSB	Sections 3.7.3, 3.74 and Chapter 17	Description of the Proposed Mining Operations / Social Environment	Groundwater	**12.1** The mine is wanting SA Water to provide up to 10L/second for stage 2. This is 864,000 L per day. The impact of this one current line users pressure is a little vague and so is the impact of Streaky Bay town water.	**12.1 <u>SA Water mains supply</u>** Water supply information and potential for impact was included in Sections 3.7.3, 3.7.4, and Chapter 17. The Company recognises that water security in the region is an important issue for residential and commercial users. There are recognised restrictions in supply to both Streaky Bay and the Inkster Road supply zone as a result of the existing infrastructure restrictions. In recognition of the community concerns Andromeda have approached SA Water to determine a solution that will not further impact the existing supply restrictions. The Company and SA Water have worked together on an engineered solution for water supply under a commitment to ensure no adverse impact to existing water supply and pressure for all existing users in the region. In execution of the plan, the Company would become a customer of SA Water, as with all other residents and business owners in the region. SA Water have undertaken the modelling to advise the Company that water supply sourced from Poochera is available and able to meet the required demand of the Proposed Development without impacting existing users supply or water pressure.

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					The Company will source water for the Project from the trunk main at Poochera by installing a larger supply pipe parallel to the existing infrastructure along Streaky Bay Road resulting in increased water supply capacity. The Company has committed to financing this upgrade and providing additional capacity at this point. Water supply for the Proposed Development will be taken at this point while still providing additional volume available for Streaky Bay and the existing Inkster water users. A dedicated water pipeline has been designed for the Proposed Development and will connect to the duplicate pipe and will be installed in the Poochera-Port Kenny Road reserve, from Streaky Bay Road to site. The Company has proposed a draft outcome of no impact to existing users.
13. M. Carey via DCSB	Chapter 5	Chapter 5 Stakeholder Consultation	Stakeholder Engagement	**13.1** We have been left extremely disappointed that neighbouring landowners were not notified of the MLA being lodged and it was left up to us to advise our neighbours.	**13.1** Refer to Submission ID 4.1.
14. Clint McEvoy			Groundwater	**14.1** Water usage and if it will affect the flow rates they have currently to keep water up to their stock during summer months Supportive submission, recognising that the mine has the potential to provide employment for locals and for new families moving to the district.	**14.1** Refer to Submission ID 6.2.
15. Clint McEvoy			Traffic and Transport	**15.1** The road and if it will handle the increase in truck traffic.	**15.1** Refer to Submission ID 1.2.
16. Clint McEvoy			Land Use	**16.1** The proximity of the mine to a landowners home	**16.1** Acknowledged.
17. Lynch	Chapter 12	Chapter 12 Air Quality	Air Quality	**17.1** Driving a Road Train at harvest time creates a lot of dust which I don't feel had been appropriately considered in this proposal	**17.1** Dust generation on the local roads and road safety were two factors that the community engagement identified as important to the community and were considered as part of the Proposed Development. Dust. The upgraded road will be designed and built to minimise dust generation with the use of selected raw material, construction method and binding agents, as necessary. As can be seen on many local roads, there are some areas that are stable and do not generate dust and other areas that do generate dust. The design and construction of the upgraded road will be in consultation with the DCSB and Department of Infrastructure and Transport (DIT). The road will be built and maintained to minimise the dust generation.
18. Lynch	Chapter 8	Chapter 8 Traffic	Traffic and safety	**18.1** A larger number of trucks will cause blowholes to appear in roads to compound safety concerns. My concern is someone could be killed if this is not appropriately considered…. I would like a response on how this has been considered and what might be done in the future to minimise this risk. Are there any penalties should a crash occur on dirt roads due to the mining operations and if so what are they? **18.2** Another issue regarding road safety is the two main highway intersections, the intersection to the Streaky Bay Road and also the intersection at Poochera meeting the Eyre Highway. I would like a response on how this has been considered and what might be done in the future to minimise this risk.	**18.1 and 18.2 <u>Road maintenance and Road Safety</u>** Refer to Submission ID 1.1 and 1.2. <u>Further context</u> Every company has a duty of care to ensure that the work it undertakes is done in a safe manner and that any hazards are identified and managed. The Company relies on the safe and efficient transport of people, materials and product in order to operate and this requires safe and stable roads. The Company is committed to upgrading and maintaining the road so that it is safe for both public users and employees. It is recognised that the Proposed Development will generate an increase in traffic on the local roads and additional traffic can result in an increase in

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				18.3 Are there any penalties should a crash occur at a major intersection due to the mining operations and if so what are they? **18.4** How does the company intend to ensure that the safety of the school bus is not compromised? What monitoring and documentation is intended to be recorded? As documented by Andromeda, heavy vehicles are not intended to travel during school bus hours. In my view this needs to be monitored and documented on a daily basis to ensure this intention is adhered too. Additionally, light vehicles should also have a definitive travel pathway and avoid school bus hours if possible.	maintenance required for the road surface. The Company has therefore committed to the upgrade of the local road to a standard suitable to support the increased traffic and to maintain the road so that it is safe and fit for purpose. The upgraded road design will be undertaken to the appropriate Australian Standards and approved by the relevant authority to ensure the works are within the required safety specifications. Company drivers will hold recognised licenses suitable for the vehicles controlled, be trained to meet the required safety standards specific to the Proposed Development and be assessed to be fit for the task. While the Company cannot be responsible for the standards and actions of other road users, it is committed to ensuring that its employees and contractors will operate safely and in accordance with all applicable laws. Should an incident occur, an investigation will be undertaken and appropriate measures enforced. **18.1 and 18.3 <u>Road accidents</u>** The Company is required to address the risk of vehicle incidents / accidents in the MP and further in the PEPR, including strategies to address public safety. Control measures proposed in the MP in regard to public safety and traffic were included in section 8.3 of the MP, and include a project-specific Traffic Management Plan. A review of traffic crash data was included in MP Appendix G. This data will be used to further detail all control measures in the PEPR. In addition to the traffic crash data, anecdotal reports of unsafe road sections and unreported incidents were collected during community consultation. This information was included in the road upgrade brief provided to the engineering design group. In the event there is a road accident involving a member of the public, the Company is committed to an independent investigation being completed within 14 days, or as agreed with the Director of Mines, in addition to an investigation which must be undertaken and appropriate measures enforced as per the *Road Traffic Act 1961*, *Motor Vehicles Act 1959* and Australian Road Rules. There may be other penalties under a variety of relevant acts including the Mining Act 1971. **18.4 <u>School buses and mine traffic</u>** Refer to Submission ID 1.2. The use of the Proposed Development's product transport trucks on public roads presents no greater risk to public safety than the existing trucks that carry grain and supplies around the region currently. However, in recognition of community concerns for the safety of children waiting for and riding on the school bus, the Company has committed to stopping haul trucks during the school bus period along the Poochera-Port Kenny Road. The travel route for light vehicles is via the Eyre Highway (Highway 1) to Poochera, then via the sealed Streaky Bay Road and then the unsealed Poochera-Port Kenny Road. The company proposes to manage a bus for employees from Streaky Bay, and this will reduce the need for individuals to use personal vehicles. The Company will adopt a policy where employees shall utilise the Poochera-Port Kenny Road to access site and avoid the use of Inkster Road where possible. Shift changes are outside of the normal school bus hours and will generally avoid the school bus.
19. Lynch	Sections 3.7.3, 3.7.4 and Chapter 17 / Section 2.6	Chapter 3 Description of the Proposed Mining Operations / Chapter 17 Social	Groundwater and use of explosives	**19.1** Above Ground: Given the large water usage, how can farmers downstream be assured that water supply will not be negatively impacted. I would like a response on how this specific issue has been considered and what can be done to ensure that this risk does not eventuate. Should it eventuate, does that mean mining usage will be	**19.1 <u>Above Ground (mains supply)</u>** Refer to Submission ID 25.1. **19.2 <u>Below Ground (groundwater)</u>**

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	and Chapter 11	Environment / Chapter 11 Groundwater		appropriately reduced back to a level such that existing users are not impacted? **19.2** Below Ground: As some farm locations is reliant on underground rather than above ground water, how can farmers be assured that underground water supply will not be negatively impacted for example the use of explosives could cause water to actually disappear. I would like a response on how this specific issue has been considered and what can be done to ensure that this risk does not eventuate. Should it eventuate, how do farmers get appropriately compensated?	Refer to Submission ID 6.2. **19.2 Explosives and Groundwater** Overlying layers of silcrete and calcrete may require limited drilling and blasting, on an as needs basis. The Company will comply with the Australian blasting compliance limits AS 2187.2 – 2006. The calcrete is several metres above groundwater. Regarding silcrete, only an area of approximately 70 m x 75 m is in contact or below groundwater. While blasting has the potential to impact the surrounding rock and affect the connected aquifer, studies have shown that surrounding bores are unlikely to be affected by blasting operations (Frank & Beaver Jr 1984). Past research has shown no significant changes in yield or water quality over a range of distances and charge weights (Sneddon 1981). Blasting can impact the surrounding rock in three ways; creation of new fractures, expansion of existing fractures and joints, and collapse of fractures (Sneddon 1981, Golder Associates 2005, Frank & Beaver Jr 1984, Bender 2006, Hawkins 2000). The literature suggests this only occurs within a contained area around the blast hole (~20m) and is very dependent on the size of blast and the rock formations (Golder Associates 2005). In none of the literature, has there been any instances of physical damage to bores (Sneddon 1981, Golder Associates 2005, Frank & Beaver Jr 1984, Bender 2006, Hawkins 2000). Even at a distance of just 10-50 ft (3-15 m) bore casing remained intact (Frank & Beaver Jr, 1984). One key reason is the propagation of vibrations through the subsurface reduces much more quickly than those on the surface (Bender 2006, Golder Associates 2005). Given existing groundwater users are located ~4 km from the mine pit, there is no credible impact to existing groundwater quality or supply from the use of explosives.
20. Lynch	Chapter 12	Chapter 12 Air Quality	Air Quality	**20.1** Has any assessment been done regarding the potential contamination of grain due to dust associated with the mine?	**20.1** Yes, an assessment has been completed. This was included in the MP Appendix K. The dust limits that The Company are will be required to meet are PM10 – 50 um/m^3 per 24 hours (0.0015 g/month) or Total Dust Deposited 4 g/(m^2 month) (30 days). See information provided in Submission ID 8.1.
21. Carey Bros Family Trust	Chapter 13, Appendix L	Chapter 13 Noise and Vibration	Noise and Vibration	**21.1 Noise** **a)** It is not clear from the Mining Proposal or Appendix L if rock breaker equipment is to be used (not listed) and if so, has this extremely noisy machinery been factored into the model. Given it has already been used on site it is assumed that it will be required during development. If a rock breaker is not factored into the model, this needs to be reexamined. **b)** It is also not clear from the Mining Proposal or Appendix L what topographic conditions are used in the model. For example, the Mining Proposal states that the ROM will be located 4 m above the current position. Has this, and other land surface changes been factored into the noise model. **c)** Finally, Figure 8 of the Appendix L (Resonate 2020) shows a contradictory layout to that of the Mining Proposal. The 'soil stockpile'	**21.1** a) Rock breaker is not anticipated to be required and was not included in the noise model for this reason. If a rock breaker is required at any time, the use of the rock breaker will comply with the requisite EPA standards. b) As noted in the Environmental Noise and Vibration Assessment, the noise model is based on equipment operating on-grade (i.e. at the existing ground surface level). A sensitivity analysis has been undertaken with plant associated with the Run-of-mine (ROM) operating at 4m above the existing ground level. This results in a negligible (less than 1 dB) change in noise levels at receiver locations. c) The layout in the Environmental Noise and Vibration Assessment MP Appendix L) is the same as that shown in Chapter 3 of the MP (Description of Proposed Development). The overburden stockpile will be 18 m above ground level.

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				layer in Appendix L is the 'overburden' layer in the Mining Proposal – and vice versa. We would like confirmation on the correct layout at the mine. Presumably, the soil stockpiles are smaller and less likely to buffer noise impacts compared to overburden stockpiles. We would like to confirm the true overburden and soil locations and how this compares to what was used in the noise model.	
22. Carey Bros Family Trust	Chapters 2, 8, 11, 12 and 13	Existing Environment, Traffic, Groundwater, Air Quality and Noise and Vibration	Noise, traffic, air quality, land use and groundwater impacts	**22.1 Other Comments** **a)** Andromeda representatives have always advised us the Poochera Port Kenny Road would be bitumen. It was only from reading through the MLA that it was discovered that there are no plans for bitumen. We do not think this is acceptable for the safety of the community for this amount of heavy traffic of a public unsealed road. **b)** The community is always concerned about water security. Landholders nearby only get just enough pipeline water (SA Water) because of lack of flow. Andromeda need to provide more information on SA Water supplies at Poochera so undue pressure is not placed on the Eyre Peninsula and local water network. **c)** Andromeda have distributed an ASX media release advising current exploration drilling will potentially extend mineralization to the north of the deposit. This is very concerning to us as more agricultural land could be at risk and again our farms economic viability into question.	**22.1** a) Refer to Submission ID 1.2. b) Refer to Submission ID 6.1. c) Please refer to the response to Submission ID 11.1 above.
23. Carey Bros Family Trust	Section 2.5.2	Chapter 2 Existing Environment	Acid mine drainage	**23.1** Not clear from document how much PAF has been estimated in the waste (volumes) and how it will be managed to ensure there are no risk to the surrounding land from potential Acid Mine Drainage.	**23.1** An Acid and Metalliferous Drainage Assessment was undertaken under the supervision of Dr. Brett Thomas from the University of Adelaide's Acid Sulfate Soils Centre. The study examined the geochemical characteristics of 86 drill samples selected to be representative of the overburden and ore from the Great White Deposit. The study showed that the region is naturally varied in relation to acidity. The formation of high purity of the Great White kaolin resulted from natural low pH conditions (acidic) that existed during the Tertiary tropical weathering process. More recently, during the drier Pleistocene, environmental changes have introduced calcrete which has an effect of increasing near surface soil pH (alkaline). Although kaolin samples with pH 4.5–4.6 were identified, the potential for material to be net acid producing was considered to be overall low. Test work shows the potentially acidic and acidic material has a low capacity to release potential or actual acidity as the acidity is bound up in low permeability clay. The calcareous materials in the overburden will provide a sufficient source of alkalinity for treating any acidic leachate generated from overburden stockpiles from the Garford Formation and Hiltaba Granite, and later from ROM stockpiles. Further, the removal of topsoil and subsoil from beneath the overburden stockpile will mean that the overburden will be placed directly on in situ calcrete. Not only is there a low capacity for the Potentially Acid Forming (PAF) to release the acidity, there is also several times more neutralising capacity in the Acid Neutralising Capacity (ANC) of the overburden. In the first two years of operation, from when overburden will be store in an overburden stockpile, a total of 159kt of PAF overburden (waste) with a typical Net Acid Production Potential (NAPP) of 1.53 (kg H_2SO_4/t) and 387kt of calcrete with a NAPP of -565 (kg H_2SO_4/t) (single analysis). Total PAF waste from the mine will be 1.8 Mt, this compares to 3.9Mt of calcrete. The Acid and Metalliferous Drainage Assessment has been included in Appendix G.

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24. Carey Bros Family Trust	2.5.3 Voids	Chapter 2 Existing Environment	Existing Environment	**24.1** As the landholder, we are unaware of any rubbish being dumped down this well in the past.	**24.1** Acknowledged.
25. Carey Bros Family Trust	Section 2.8.2, Appendix H6	Chapter 2 Existing Environment and Appendix H6 survey for West Coast Mintbush, Malleefowl and Dinosaur Ants	Flora and Fauna surveys	**25.1** One transect isn't sufficient to confirm the presence of species of conservation significance. A targeted survey consisting of closer transects (10 – 50m depending on terrain and vegetation density) across all areas considered likely or possible to contain habitat if more appropriate. This approach would more accurately confirm the presence of West Coast Mintbush or other conservation significant flora.	**25.1** A targeted survey of three transects (each >3 km) for West Coast Mintbush was undertaken by Ecological Horizons Pty Ltd (Ecological Horizons). The West Coast Mintbush was surveyed by walking through its preferred habitat, visually scanning for its bright red calyx enclosing each flower. Immediately prior to the survey, all participants familiarised themselves with the mintbush and its preferred habitat by visiting a known population at Sceale Bay, approximately 50 km west of the Great White Deposit. Limestone outcrops with Melaleuca species, Native Apricot, Quandong, Grevillea, Hakea and Spyridium were surveyed more intensely as the mintbush is commonly found among these understory plants. Three transects (each >3 km) through the Great White Deposit were walked targeting prospective areas for mintbush, searching for the red flowers which would have been evident at this time of year. Ecological Horizons were unable to confirm the presence of West Coast Mintbush within study area over the Great White Deposit.
26. Carey Bros Family Trust	2.12.4	Chapter 2 Existing Environment	Land Use	**26.1** The proposed development represents 6% of productive farming land for the land owner.	**26.1** Acknowledged.
27. Carey Bros Family Trust	2.12.4	Chapter 2 Existing Environment	Stakeholder Engagement	**27.1** Comment on land access negotiations.	**27.1** Comment. Land access negotiations will remain confidential and between the Company and landholder.
28. Carey Bros Family Trust	Section 2.13.1	Chapter 2 Existing Environment	Dust impacts to housing	**28.1** This refers to Section 2.16 Noise but does not refer to Dust impacts for sensitive receptors for housing	**28.1** Potential dust impacts to receptors as a result of the proposed mining operations are discussed in detail in Chapter 12 Air Quality and Appendix K Air Quality Impact Assessment.
29. Carey Bros Family Trust	Section 2.18	Chapter 2 Existing Environment	Proximity to conservation areas	**29.1** Is there any impact to nearby /bordering vegetation heritage agreement areas (as shown in Fig 2-37)? The vegetation heritage agreement areas border mine site and road.	**29.1** A portion of land subject to Native Vegetation Heritage Agreement HA 511 will be impacted by the Access Road MPL. The land is held under a Perpetual Lease in the name of the Minister for Environment and Water. Both the lessee and the Native Vegetation Branch of the Department for Environment and Water have been consulted and are supportive of the Project. All appropriate processes to enable this to occur will be undertaken prior to the commencement of any activities relating to the Access Road MPL. Potential impacts on native vegetation generally are included in Chapter 9 of the MP, and environmental off sets will be addressed in the PEPR.
30. Carey Bros Family Trust	Section 3.1	Chapter 3 Description of Proposed Development	Working hours	**30.1** Other parts of the document refer to 6 day working week – please confirm the proposed hours per mining stage (Construction, Stage 1, Stage 2). Recommendations in Noise and air quality reports aren't modelled on 7 days (please confirm).	**30.1** **Mining and Construction** Mining activities are proposed to occur during day shift, Monday to Saturday only. The shift times are nominally 6am to 6pm, with restricted activities prior to 7am. This may evolve to 7am to 7pm should activity restrictions become impractical. **Processing** Processing operations are planned to occur 24 hours per day, 7 days a week. Noise modelling predicts noise levels in dB(A)L_{eq}. dB(A)Leq is commonly understood as equivalent continuous sound level.

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					To be conservative, noise modelling included:
					Construction:
					• Operating days / hours: 6 am – 6 pm, 7 days per week.
					Operation:
					• Mobile Plant
					  • Operating days / hours: 6 am – 6 pm, 5 days per week.
					  ▪ Note: This should be 6 days per week, however, does not change or contribute to the noise modelling undertaken.
					• Process Plant
					  • Operating days / hours: 24 hours, 7 days per week.
					Noise modeling scenarios included:
					• Construction
					• Stage 2 operation - day
					• Stage 2 operation – night.
					Stage 1 operation – day was not modelled, as it will be less than *Stage 2 operation – day* predicted noise level, as *Stage 1 operation – day* includes only mining, not mining and processing. As *Stage 2 operation – day* is able to meet the EPA noise criteria, Stage 1 operation – day certainly will.

31. Carey Bros Family Trust	Section 3.1	Chapter 3 Description of Proposed Development	Site Layout	**31.1** This map includes outlines of soil stockpiles (circled in red) which have not been included on previous discussions. There is no description of how long these stockpiles will remain in place, how high they will be and if they genuinely offer any noise buffering properties. A better option might be to put the overburden here (instead of topsoil stockpiles) as it can be stockpiled higher and provide a better buffer (given soils stockpiles are generally no higher than 2m). Given this is the area that will buffer the noise, dust and visual amenity - there should be more thought into placing a bund along here from overburden or top-soil or a dense planting of trees and shrubs prior to implementation.	**31.1** The overburden stockpile will remain in place after the mine has ceased operating, and the area is rehabilitated. The soil stockpiles will be used during rehabilitation. These stockpiles will be maintained to a height of 2 metres for topsoil or 5 metres for subsoil. These topsoil/subsoil areas will be maintained for the Life-of-Mine. During the PEPR these areas will be further refined. The noise predictions (modelling) and assessment is conservatively based on existing topography with no reliance on any noise attenuation from soil stockpiles or overburden. The Company notes that in general, bunds / barriers provide the most noise mitigation when either the noise source or receiver is located in close proximity to the barrier. Where suitable, soil bunding will be used to provide barriers. In order to keep the proposed ML area required to as small as possible at the request of the landholders the Company has limited the size of the bunding around the perimeter of the Proposed Development. Additional bunding requirements and variations to the site layout will be undertaken as part of the PEPR.
32. Carey Bros Family Trust	Section 3.1.1	Chapter 3 Description of Proposed Development	Mining Equipment	**32.1** Is a 'rock breaker' going to be required/used? These machines are extremely noisy and don't seem to be factored into the noise model (not on the list of equipment)	**32.1** The Company does not anticipate the use of a rock breaker, therefore it was not included in the noise modelling undertaken for the Proposed Development. If a rock breaker is required at any time, the use of the rock breaker will comply with the requisite EPA standards.
33. Carey Bros Family Trust	Section 3.1.1	Chapter 3 Description of Proposed Development	Frequency of blasting	**33.1** This statement contradicts Table 12.4 (page 318) which lists blasting frequency during construction, Stage 1 and Stage 2 as "Quarterly, if required". How often will blasting occur? A Blast Management Plan will be required.	**33.1** The Company does not have an indicative schedule for blasting. Geological definition of the calcrete in the Great White mining area provides approximately 50,000 bcm per month (bcm = bank cubic metres) to be removed during the first 10 months. It is estimated that 70% of the calcrete is largely powdery and unconsolidated with only minor hard banding, and generally

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					able to be free dug with traditional excavation methods. The other 30% is more competent and it is anticipated that it will be ripped prior to excavation. In some areas of the proposed 26 year mine plan (typically in the scrub areas) there is higher strength calcrete that is considered hard enough to require the use of explosives prior to excavation. In the startup months with establishing the mine, there may be a need to blast approximately once a month, however, after the first 10 months it is anticipated that blast requirements will reduce to once a quarter (per 3 months). The statement in the MP outlined: *Blasting will be undertaken as required and is expected to occur no more than monthly, although more likely on a quarterly basis and between 7am and 7pm weekdays.* A typical blast event would take a few seconds, and rarely last over 10 seconds. Even though the use of explosives on site is considered infrequent, the management of explosives and their use is very important and highly regulated. Detailed procedures controlling the use and storage of explosives on site will be developed as part of the PEPR. A Blast Management Plan will be developed for each blast and include blasting protocols, safety management plans, powder factor, instantaneous explosive charge weight, initiation sequencing, community notification and clearance areas. Maximum charges are likely to be reflective of that included in Chapter 13, section 13.4.4. Instantaneous charge weight is proportional to the level of vibration generated by the blast. Magnitude of blast vibrations diminish over distance from the blast location. One key reason is the propagation of vibrations through the subsurface reduces much more quickly than those on the surface (Bender 2006, Golder Associates 2005). Blast vibrations generated by any blasting within the Proposed Development are expected be below prescribed levels within 500 m from the blast site. Identified existing receptors are in excess of 1km from any likely blast site and the proposed processing facility will be within a 1km perimeter. Blast designs will need to ensure protection of the processing plant and in doing so will ensure that regional residential receptors will not be adversely affected by blasting.
34. Carey Bros Family Trust	Section 3.1.1	Chapter 3 Description of Proposed Development	Rehabilitation and closure	**34.1** Will the area be revegetated with native vegetation or will it be made available for cropping/pasture as the mine is backfilled – not clear.	**34.1** The Life-of-Mine is approximately 26 years. The Company has committed to revegetating with native species and/or introduced fodder plants. This would be determined through the duration of operations and will likely include a mixture across the site. The requirement for post mine land use is safe and stable, and the Company must ensure that the post mining areas are designed such that they do not cause a hazard into the future. Part of this work will be to identify through trials which plant species best suits the requirements. During the PEPR phase, closure domains will be delineated, and proposed vegetation species will be identified for each domain as the priority revegetation species for closure for that area.
35. Carey Bros Family Trust	Section 3.4.2	Chapter 3 Description of Proposed Development	Site Layout	**35.1** There seems to be an open area (in between Pit 4 and exterior of Pit 15) but not clear what it's for – noise/ dust buffers? We have always requested less land be sterilized from agriculture.	**35.1** The ML has been sized to encompass the mine, soil stockpiles, overburden and clay, bunding and roads, and any future refinements in mine design. It been reassessed and reduced to as small as practically possible after engagement with the landholders, taking into account the extents of the geological deposit. The small ML area has been queried by the regulator as being of a suitable size to undertake operations. Figure 3-7 of the MP outlines the potential for the mine pit to expand based on the known geology. Similar space has been allowed for on the southern end of the pit near pit 13.

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36. Carey Bros Family Trust	Section 3.4.5	Chapter 3 Description of Proposed Development	ROM stockpile	**36.1** Does the noise assessment / model take into account that the ROM will be 4m above current levels?	**36.1** See Submission ID 21.1.
37. Carey Bros Family Trust	Section 3.4.6	Chapter 3 Description of proposed development	Use of explosives	**37.1 a)** Inconsistent messaging on the frequency of blasting. **b)** Will a Blast Management Procedure Plan be developed that includes details on what the applicant needs to do prior, during and after a blast including how much notice to give landowners? Will this plan be available to landowners? **c)** Also Blast Management Plan to include monitoring of impacts associated with blast vibrations, including infrastructure damage. **d)** Ensure that vibrations are assessed. An assessment of local infrastructure (including houses) should be undertaken to determine a baseline prior to any implementation. **e)** The blast monitoring may be included in the Blast Management Plan	**37.1** a) Refer to Submission ID 33.1. b) Yes. The Blast Management Plan will include those details and will be available for comment through PEPR development. Additionally, the Company will develop a Communications Protocol which will outline the requisite communications procedures around blasting activities. c and d) If required and blasting is planned proximal to receptors, monitoring can be undertaken with geophones to measure vibration and air-overpressure. The locations of which will be determined through PEPR development using specialist input to determine the most appropriate locations. Blast vibrations and air overpressure calculations have been determined based on compliance with AS2187.2.2006. This standard is based on human comfort rather than structural damage. The vibration criteria for human comfort are more stringent than the vibration criteria for structural damage for buildings. Cosmetic or structural damage to buildings would only occur due to extreme vibration levels relative to what humans would find tolerable or uncomfortable. The vibration criteria for human comfort rather than structural damage which has been adopted for this project. Blasting will be undertaken in rock rafts of calcrete or silcrete. These rock units are unconnected to each other and interbanded with low strength weathered rock and soils. Propagation of vibrations through the subsurface (overburden) reduces much more quickly than those on the surface (Bender 2006, Golder Associates 2005). Calculations have been undertaken and resultantly, receptors which are greater than 500 m from the blast are not expected to be impacted from vibrations generated from blasting. e) Monitoring will be included in Blast Management Plan and PEPR.
38. Carey Bros Family Trust	Section 3.4.6	Chapter 3 Description of Proposed Development	Site Layout	**38.1** What does the soil stockpile represent? How high will they be? How will explosive Magazine site be built on soil pile	**38.1** Soil stockpiles are areas set aside to store soils until they are used for rehabilitation of the mine. Depending on the type of soil, it is stockpiled in heaps of either 2 m height or 5 m height. It is not anticipated that an onsite magazine will be required, however to ensure that all eventualities are covered, a magazine area has been anticipated. The explosive magazine was located within the soil stockpile as explosive magazines are required by law to be located within clean fill bunds. The magazine will be a specially designed sea container that will sit on the ground within the soils stockpile. The soil stockpile will be shaped to use soil as bunding around an explosives magazine if one is required, however, it is anticipated that explosives will only be brought to site on an as need basis at this stage.
39. Carey Bros Family Trust	Section 3.4.7	Chapter 3 Description of Proposed Development	Noise and Vibration	**39.1** Please confirm if a rock breaker be required? These are extremely noisy and should be factored into any noise modelling.	**39.1** Rock breaker is not anticipated to be required and was not included in the noise model for this reason. If a rock breaker is required at any time, the use of the rock breaker will comply with the requisite EPA standards.

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40. Carey Bros Family Trust	Section 3.4.8	Chapter 3 Description of Proposed Development	Mine dewatering	**40.1** How and where will water be collected and stored – assuming water will not be required for dust suppression during rainfall events, and so water collected during these times will need to be stored for drier conditions. Has a water collection sump/tank etc. been factored into the disturbance footprint?	**40.1** See Figure 3-18 of the MP which includes stormwater ponds (three ponds, all sized conceptually at 40m x 12m). Due to the significantly higher level of evaporation (<2,000 mm/year) in the Proposed Development area compared to rainfall (~326 mm/year) it is unlikely that any stormwater will remain in the catchments. If stormwater is available it will be used for dust suppression or watering revegetation areas.
41. Carey Bros Family Trust	Section 3.4.9	Chapter 3 Description of Proposed Development	Rehabilitation and Closure	**41.1 a)** Will there be a pit void remaining at closure? **b)** The closure (post mine) environment has not been properly described. **c)** It is not clear what proportion will be returned to native vegetation and what proportion will be returned to pasture. **d)** A detailed rehab plan should be submitted	**41.1** a) There is expected to be a small rehabilitated mine depression at closure, after the final pit in the south is mined. The majority of the mined area will be progressively backfilled as part of the mining method leaving only the final pit area unfilled but shaped and rehabilitated to a safe and stable form. See Figures 3-27 and 3-28 of the MP (cross section B-B). Updated site layout graphics are included in Appendix D. b) Comment. c) See Submission ID 34.1. d) Detailed Closure is required as part of the PEPR, while the MP is more conceptual.
42. Carey Bros Family Trust	Section 3.5.2	Chapter 3 Description of Proposed Development	Hours of Operation	**42.1** Does this equate to 6 or 7 days? Should this be 6 – operating hours for all stages are inconsistent throughout the document.	**42.1** Please refer to response to Submission ID 30.1 above.
43. Carey Bros Family Trust	Section 3.5.4	Chapter 3 Description of Proposed Development	Mine dewatering	**43.1** This is confusing – is there going to be dewatering at the proposal area or not. Dewatering requires storage and or discharge, which has not been discussed.	**43.1** Mining will occur above water table until pit 5 in year 5, From year 5 onwards, dewatering will occur at rates less than 1 L/s. This water is expected to evaporate off. Some of this water may pond and be pumped from the pit using a series of sumps and pumps, transferred to the water storage dam within the processing area, and used for dust suppression onsite.
44. Carey Bros Family Trust	Section 3.6.2	Chapter 3 Description of Proposed Development	Waste	**44.1 a)** Some salt to be returned to the pit, how much is 'some' - is there any potential impacts from an increase in soil salinity of the site - impacts on future production **b)** How much water will this equate to over the life of the mine. What is the estimated quality of the RO reject (salinity levels)? **c)** What are the potential impacts of this water on the soil for dust suppression?	**44.1** a) Refer to Submission ID 6.2. b) The reverse osmosis (RO) brine is estimated to be approximately 2.5 L/s over the life of mine. The quality of this brine has been estimated using a salt balance and is expected to be approximately 16,000 ppm TDS. For context, sampling and analysis of groundwater indicated a neutral to slightly alkaline pH with moderate to high salinity (generally between 6,000 and 20,000 mg/L TDS). Sheep consume water up to 10,000 mg/L TDS. Seawater is 35,000 mg/L TDS. It is important to note that no salt is added during the operations and any natural salt in the kaolin will be managed and returned in the backfill. c)Saline water will be applied to formed roads, which will be rehabilitated and revegetated at the end of the mine's life. The water used for dust suppression will be mixed into the road building material and not used on vegetated soils. Dust suppression will be undertaken using directional sprays which face towards the ground. Proximal mist overspray which may occur would be at such low volumes and limited spread that it will not have any impact on adjacent land.
45. Carey Bros Family Trust	Section 3.7.3	Chapter 3 Description of	Utilities	**45.1 a)** Power - have the gen sets been taken into account in the noise assessment?	**45.1**

Item #	MP Section #	Chapter Name	Issue	Concerns/ Questions / Benefits/ Further Information Requested	The Company's Response
		Proposed Development		**b)** Water – Stage 1 – 50KL per day trucked in from Poochera Stage 2 – Various different references as to water usage for Stage 2. Water for stage 2 will come through SA Water pipeline to site. Here it is stated that water usage will be 25m3 / day for operation phase but on page 157, Figure 3.21 the number is 25.5m3 / hour (or 7.1L/s). Which is correct? **c)** Stage 2: "Upgrades to ensure any water supply or pressure to existing customers are not impacted." Who will guarantee existing customers are not impacted? SA Water or Andromeda? **d)** Is SA Water or Andromeda undertaking the infrastructure works to deliver water to the ML from the junction of Streaky Bay / Pt Kenny Road? **e)** Figure 3.21 requires 7.1L/s SA Water Potable but elsewhere in the document (pages 110 & 170) reference 10L/s from SA Water. What will the 2.9L/s be used for if available from SA Water? **f)** It is stated that Streaky Bay is currently experiencing impacts to their level of service in regards to water supply (volume and pressure). How will Andromeda taking 10L/s affect the supply and pressure into Streaky Bay? **g)** The applicant states it is open to considering landholder offtakes from the proposed water pipeline. Would this be through SA Water or the applicant? If the applicant requires 10L/s from SA Water through the pipeline for mining operations, what excess of water (L/s) can landholders' access? **h)** If offtakes were considered and granted for landholders, what would happen to this water supply in the event of mine closure?	a) It is proposed to use 6 generators will be operated during day-shift. The proposed generator type is understood to be 14 kVA trailer mounted or similar with acoustic canopy. This may change with improvements in generators and efficiencies of equipment. When operating these generators typically have a sound power level in the order of 90 to 100 dB(A), comparable to Toyota Hilux or similar light vehicle. Inclusion of generators in the noise would result in a negligible increase in overall noise levels. b) Stage 1 water requirements were underestimated in the MP. Water will be trucked to site using B-double trucks with a capacity of up to 50 kl. It is anticipated that half the load (one tanker) will be used for dust suppression and road construction and the second will be disgorged at the mine for use as dust suppression. The mine dust suppression is estimated at 2.7 l/s and will use around 250,000 l per day. 10 loads per day will be brought in from Poochera. c) See submission ID 6.1. d) The design, and construction of the pipeline is currently being negotiated with SA Water. At this point in time, it is understood that SA Water will construct the works from the Poochera mains truck to the Streaky Bay Road – Poochera-Port Kenny Road intersection, and the Company will construct it from there to the ML. The Company will be funding the pipeline construction through a combination of a SA Water Developers' agreement and the Miscellaneous Purposes Licences outlined in the MP. e) 10 L/s is a peak required, whereas the 7.1L/s is an average requirement. f) See submission ID 6.1. g) SA Water are the primary facilitator of water supply, however, the Company would be the constructor, operator and owner of the pipeline from the Streaky Bay Road – Poochera-Port Kenny Road intersection to the ML, and would need to be part of the agreement to enable ay proposed offtakes. SA Water will be able to work with all parties to provide information on additional water able to be supplied. h) At this stage (without offtake agreements in place), it is assumed this pipeline would be capped and headworks removed (as required by the *Mining Act 1971*). In the event that there are other users of this pipeline who use and rely upon this water, there is the opportunity to have the pipeline ownership transferred to SA Water and remain in place for those users in perpetuity.
46. Carey Bros Family Trust	Section 3.8.1	Chapter 3 Description of Proposed Development	Area required for mining	**46.1** Over the last 18 months the mine boundary has increased considerably with no consideration to us as landowners. We have felt let down by Andromeda with the mine lease footprint moving more to the north and west than we were advised. Even now during the MLA submission period, Andromeda have distributed an ASX media release advising current exploration drilling will potentially extend mineralization to the north of the deposit. This is very concerning to us as more agricultural land could be at risk and again our farms economic viability into question. (Ref: Andromeda ASX Announcement, 4 May 2021. Drilling underway at Great White Deposit)	**46.1** The mine lease area has been reduced after conversations with the landholders to minimize the impact on their farming enterprise where possible, to the detriment of the mine's operational flexibility. The impacted to arable land has been reduced by 26% through five iterations. The Proposed Development area is defined by geological features and whilst every attempt has been made to reduce the size, the Proposed Development is based on a geological deposit that cannot be moved or changed in its dimensions. See Submission ID 11.1. In addition, this drilling is to further define the area outlined in Figure 3-7 of the MP – as queried in Submission ID 35.1.
47. Carey Bros Family Trust	Section 3.8.1	Chapter 3 Description of	Native vegetation	**47.1** Please re check this table or be make clearer: Column 3, title (% in proposed tenement area to be cleared) - the title doesn't make sense as not always referring to tenements	**47.1** To provide more clarity around numbers per area in Table 3-18: *Mining Lease*

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		Proposed Development		Column 4, row 1 (257) if its 100% in the previous column, then why is this not 308ha (or whatever the number is in the second column) instead of 257ha? Colum 2, row 1 (318) – should this value be 308? Column 1, row 5 (Inkster IBRA…) - IBRA doesn't necessarily represent native vegetation – more of a region (the table is about native vegetation) Column 3, row 5 (0.1%) not representing native vegetation – not clear how this value is derived Column 4, row 5 (257) - how can amount to be cleared be 257ha if there is only 151 ha of native vegetation in the mining lease (77% of which is going to be disturbed). Confused. Column 2, row 14 (0), Water pipeline - Cleared land - should there be some cleared areas in this calculation. Is the total clearing footprint just 6ha within a 78ha envelope?	• 77% (308 ha) of the ML is covered in vegetation (including cropping vegetation). This includes 51% (157 ha) representing non-native vegetation – e.g. cropping). • There is 151 ha of native vegetation within the ML. 116 ha of this is expected to be cleared. • There is 157 ha of non-native vegetation (e.g. cropping) within the ML. Of this, there is 141 ha expected to be cleared. • In total, there is 308 ha of vegetation (including native and cropping), of which 257 ha is expected to be cleared. *Access Road MPL* • The Access Road MPL covers 13 ha of native vegetation. Conservatively all of this has been calculated to be cleared. This will be further refined in the PEPR. *Water Pipeline MPL* • The Water Pipeline MPL covers 78 ha. As the pipeline will be located alongside the existing road, in primarily already cleared/disturbed areas, a maximum of 6 ha of native vegetation is expected to be cleared. The Company recognises that final land clearance applications and approvals will delineate these areas in more detail as required by the *Native Vegetation Act 1991* (SA).
48. Carey Bros Family Trust	Section 3.9.1	Chapter 3 Description of Proposed Development	Rehabilitation and Closure	**48.1** What are the dimensions (length, width and depth) of the mine void post closure? It is presented in Fig 3-27 and 3-28 but no values are provided. What is the final loss of farming land post mine?	**48.1** The final mine void will be approximately 300 metres x 400 metres as per Figure 3-27 in the MP. The pit will be backfilled to form a and safe and stable landform with final depth to be determined in PEPR. Post closure land uses will include both grazing and native vegetation. Updated site layout graphics are included in Appendix D.
49. Carey Bros Family Trust	Section 3.9.1	Chapter 3 Description of Proposed Development	Rehabilitation and Closure	**49.1** Post closure pit – what are the dimension of the post closure pit. Will this pit be treated with the same rehab requirements as other parts of mine backfilled?	**49.1** Refer to Submission ID 48.1. The pit will be made into a safe and stable landform.
50. Carey Bros Family Trust	Section 3.9.1	Chapter 3 Description of Proposed Development	Rehabilitation and Closure	**50.1** The B line in 3-27 doesn't quite match up with what is presented in the cross section of 3-28.	**50.1** The cross section in MP Figure 3-27 and 3-28 is conceptual. A more detailed cross section has been provided in Appendix D.
51. Carey Bros Family Trust	Section 3.10.2	Chapter 3 Description of Proposed Development	Energy sources	**51.1** LPG Power generation. On site LPG fuel storage capacity of 100,000 t (196,000 L) with usage of 20 t per day for stage 2 operation. Are these amounts correct – please confirm?	**51.1** The MP includes an on-site LPG storage tank with a nominal capacity of 100,000 t. This will be confirmed through the DFS.
52. Carey Bros Family Trust	Section 4.1.1	Chapter 4 Legislative Framework	Mining Act	**52.1** are EL's owned? (or 'lease held by'…)	**52.1** There is no set rule. Exploration Licences (ELs) are granted by the Minister for Energy and Mining for a certain term and can be 'owned by' or 'held by' a particular party or parties. Further, EL holders can be referred to as Tenement Holders, titleholders or Licensees. An EL is held by a party and can be traded with other parties. A holder of the EL must maintain the EL in good standing and undertake certain works to keep the EL. If this work is not undertaken with the aim of developing the EL, the EL can be taken back by the DEM.
53. Carey Bros Family Trust	Section 4.1.2	Chapter 4 Legislative Framework	Activities of Environmental Significance	**53.1** Column 1, Activity type: Are other activities direct clearing of vegetation, generation of dust, noise and light spill (which impact local sensitive receptors) – or are these listed activities just related to discharge and pollutant related activities?	**53.1** Activities of Environmental Significance are defined by Schedule 1 of the *Environment Protection Act 1993* (SA). For this project, they are: • Schedule 1; 1-Petroleum and Chemical (5) • Schedule 1; 2-Manufacturing and Mineral Processing (9).

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					Other activities such as direct clearing of vegetation, generation of dust, noise and light spill are regulated by other parts of the *Mining Act 1971*, *Native Vegetation Act 1991*, and other sections of the *Environment Protection Act 1993* as well as their associated applicable Regulations and/or policy documents.
54. Carey Bros Family Trust	Section 5.5.4 r	Chapter 5 Stakeholder Consultation	Noise and Vibration	**54.1** Row 1. Not clear how bunding will be used to buffer noise – yet to see this explained as a genuine mitigation measure. Row 3. Doesn't address the general operations - blasting is covered in the row below (row 4). Doesn't answer how noisy will the mine operation be?	**54.1** Bunding or hard barriers are commonly used across a variety of industries and transport projects to mitigate the impacts from noise. The noise modeling has been deemed by the EPA to be conservative and expected to meet the regulated levels at surrounding receptors. Bunds of soils and overburden will be used around the site to provide for delineation of project areas and potential noise barriers, but have not been relied upon as primary noise mitigation in modelling. See Government submission ID 43 and 44. Detailed information on predicted noise levels has been included in Chapter 13 of the MP. Additionally, applicable noise criteria for the Proposed Development were included on posters developed for the community during the drop-in days held in October 2020 and February 2021.
55. Carey Bros Family Trust	Section 5.5.4	Chapter 5 Stakeholder Consultation	Rehabilitation and Closure	**55.1** Not clear what the final land use will be -suitable for farming, native vegetation - or both?	**55.1** Mine closure has been described conceptually in Chapter 3, section 3.10 of the MP and will be dealt with in more detail during development of the PEPR. See submission ID 34.1.
56. Carey Bros Family Trust	Section 5.5.4	Chapter 5 Stakeholder Consultation	Site Layout	**56.1** The permanent overburden stockpile should be positioned west of the pit to buffer noise, dust, and light spill from the R1 sensitive receptor less than 1km from the operation.	**56.1** Placing the overburden stockpile to the west of the pit would result in a larger ML to the west-northwest. The Company has complied with previous requests by the landowner to reduce the ML as far as feasible within that specific paddock.
57. Carey Bros Family Trust	Section 5.5.4	Chapter 5 Stakeholder Consultation	Traffic and Transport	**57.1** Reduced trucking? No commitment to zero trucking/haulage during this time? (avoid 1 bus route, twice a day for 5 days) What procedures and communications are going to be put in place and how will it be measured?	**57.1** In recognition of community concerns that were provided during the drop-in days and individual interactions with landholders, the Company has committed to no trucking on the Poochera-Port Kenny Road during school bus movements in response to the Community's requests. See Submission ID 1.2.
58. Carey Bros Family Trust	Section 5.5.4	Chapter 5 Stakeholder Consultation	Traffic and Transport	**58.1** Roads and Traffic It's not clear what the haulage hours will be - are they also 7 days a week 24 hours? How many trucks a day will be using the road?	**58.1** Refer to Submission ID 30.1. Stage 1 product transport (24 HV movements) is expected to be undertaken during the hours of 7am to 7pm Monday to Saturday, while Stage 2 product transport (10 HV movements) is expected to occur over the 24 hour time period, every day as required, as processing is proposed to occur 24 hours per day.
59. Carey Bros Family Trust	Section 5.5.4	Chapter 5 Stakeholder Consultation	Air Quality	**59.1** 50KL water per day when a proposed 1600 tonnes would be moved out of the pit per day. Can Andromeda achieve satisfactory dust suppression, for the listed activities (stripping topsoil and overburden, loading, unloading, applying water to all haulage routes) with this amount of water? As a comparison, Stage 2 dust suppression is 9m^3 per hour (Figure 3.21).	**59.1** Refer Submission ID 45.1.
60. Carey Bros Family Trust	Section 5.5.4	Chapter 5 Stakeholder Consultation	Groundwater	**60.1** 260ML/Yr which is contradicted in section 3.10.3 which states the annual 290ML/yr. Please confirm and clear up inconsistencies in water use volumes (and in various other measurements/messaging – including work and operating hours etc.) it is hard to work out just how much water is required.	**60.1** The estimate of water consumption is 7.1 litres per second or 25.5 m^3/hour.

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					This equates to 223 ML/year however the pipeline is being design for 10 litres per second (315 ML/year) to manage any changes which occur during detailed design. The 35m^3/hour and 290 ML/year (approximate) referred on 3.10.3 is total water usage on site taking into account water from entrained groundwater in ore feed. The 260 ML in Section 5.5.4 refers to an early estimate used in community engagement. The final detailed water demand will be refined with detailed design and engineering.
61. Carey Bros Family Trust	Section 5.6	Chapter 5 Stakeholder Consultation	Outcome development	**61.1** Suggests that no accommodation was made for community issues/concerns.	**61.1** Engagement is respectful with the intent of listening for issues and concerns from the community. The entire MP has been developed in recognition of input from the community. The Company has used its best endeavours to address all issues which were raised through the development of the MP. Outcomes were developed through analysing over 311 unique interactions with local landowners and community members, of which 65% of contact was with immediate landowners. Further, the outcome statements were then presented at Community Drop-in Days in both October 2020 and February 2021. The outcomes statements which were proposed during these sessions were adopted for the Proposed Development after receiving feedback. While some additional clarity has been required by the community, there were no issues raised during the public consultation period, or within submissions received, that had been previously unidentified.
62. Carey Bros Family Trust	Section 5.6	Chapter 5 Stakeholder Consultation	Visual Amenity	**62.1** "Visually softened" cannot be quantified. Please provide details on planting density (i.e., 1000 stems per ha) and species to be used (mix of native trees and shrubs) and the thickness of the planting (i.e., 50m x 500m corridor).	**62.1** This level of detail will be determined through development of the PEPR.
63. Carey Bros Family Trust	Section 5.6	Chapter 5 Stakeholder Consultation	Visual Amenity and Air Quality	**63.1** Please provide details on what measures will be implemented to reduce light spill impacts and how this will be monitored to ensure that it is achieved. If there is a breach, what measures will be implemented to ensure that impacts can be reversed? **63.2** Will each mine boundary have numerous dust monitors to account for different movement of dust offsite?	**63.1** The Company has proposed the outcome "The Tenement Holder must during construction, operation ensure no public nuisance impacts from light spill are generated by mining operations". It is intended that this will be achieved through use of directional lighting, design and construction of visual screening bunds (to remove line of sight where possible), preferential use of vertical lighting beams, shields and spotlights to minimise the spill of stray light. This is expected to be verified by requiring the inspection by suitably qualified personnel against the parameters of visual amenity related to obtrusive effects of outdoor lighting once the site has been constructed. The Company has also set a target of acknowledging any lighting complaints within 48 hours and then ensuing all reasonable efforts are made to rectify the cause. These complaints and the actions undertaken to resolve the issue will be reported through to the DEM. If the site is in breach of conditions granted by the ML, outcome or measurement criteria, the DEM are able to exercise the provisions as listed in "Part 10B – Compliance and Enforcement" of the *Mining Act 1971*. **63.2** The location of dust monitors has not yet been determined and will be confirmed through development of the PEPR. The Company is committed to installing a range of air quality monitors on a representative number of adjoining properties, as well as within the ML. The locations are to be confirmed through PEPR development on advice from air quality monitoring specialists.

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64. Carey Bros Family Trust	Section 5.6	Chapter 5 Stakeholder Consultation	Visual Amenity	**64.1** Again, how will this be achieved and monitored and if there is a breach, what measures will be implemented to ensure that impacts can be reversed (i.e., contingency)	**64.1** If there is a breach of the ML conditions, outcomes or measurement criteria the DEM may exercise enforcement provisions under Part 10B of the Mining Act.
65. Carey Bros Family Trust	Section 5.6	Chapter 5 Stakeholder Consultation	Visual Amenity	**65.1** As above all outcome statements need to prescriptive, and the measures prescribed need to be achievable and measurable. For the points listed, how will it be achieved and what measures will be implemented to ensure impacts can be reversed?	**65.1** Measurement criteria have been drafted and proposed within each of the environmental aspect chapters which have an outcome. These draft measurement criteria can only be finalised once the ML is granted and conditions and outcomes confirmed by the DEM. The following measurement criteria has been proposed at this stage in regard to visual amenity (as outlined in Section 15.5): *Post construction audits of buildings and annual audits of the overburden stockpile confirm they comply with design parameters.* As noted above, if there is a breach of ML conditions, outcomes or measurement criteria, the DEM may exercise enforcement provisions under Part 10B of the Mining Act.
66. Carey Bros Family Trust	Section 5.6	Chapter 5 Stakeholder Consultation	Air Quality	**66.1 a)** As one of the immediate land owners, we have continually expressed concern to Andromeda about the impact of dust from the mine on crops and pasture that will closely border the proposed mine site and road network. Can Andromeda clarify what these impacts will be? Quality Assurance is a big part of agriculture with livestock (meat & wool) and grain becoming highly regulated. As a landowner, we currently operate livestock over all our property. The two main paddocks affected by the proposed mine have significant grazing value as well as abundant shelter for sheep during adverse weather conditions. No other paddocks on our home property have the equivalent shelter for livestock. If this land is acquired, it will affect our livestock operation considerably. Our sheep (ewes) lamb in late winter and having this shelter is very important during this time. Losing it will be a big loss to our farming enterprise. **b)** Our sheep feedlot is located within 400m of the proposed mine. What measures will Andromeda implement to ensure the health and safety of our livestock in regards to dust, noise, especially blasting, to eliminate the impact on our feedlot?	**66.1** a) and b) This concern has been addressed in Submission ID 8.1 and Appendix B.
67. Carey Bros Family Trust	Section 6.3.4	Chapter 6 Impact and Risk Methodology	Care and Maintenance	**67.1** What happens if the mine commences but doesn't persist - is there a care and maintenance phase?	**67.1** Care and maintenance provisions are required to be detailed in the PEPR to the satisfaction of the DEM.
68. Carey Bros Family Trust	Section 8.1	Chapter 8 Traffic	Traffic and Transport, Air Quality	**68.1** Issue of Traffic dust impacts from vehicle movements within the mining area on adjoining landowners is not included in this list but has been raised numerous times with Andromeda.	**68.1** Noted. See submission ID 17.1.
69. Carey Bros Family Trust	Section 8.4.1	Chapter 8 Traffic	Pavement condition and wear	**69.1** The extra traffic generated in particular on the unsealed road (Poochera to Port Kenny Rd) from mining traffic along with the existing vehicle movement will have more than a minor impact.	**69.1** Transport studies have identified that traffic generation and distribution from the Proposed Development falls within existing road link capacities. It is expected that any damage would be minor and reparable. As noted in Submission ID 1.2 above, the Company has committed to funding road upgrades, as well as ongoing maintenance, including upgrades to Poochera-Port Kenny Road and the intersection with Streaky Bay Road. Upgraded designs for the intersection have been provided to

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					the Department for Infrastructure and Transport for review and approval. The Company is also working with the DCSB on the required road upgrades.
70. Carey Bros Family Trust	Section 8.4.2	Chapter 8 Traffic, Appendix G, Traffic and Transport Assessment	Traffic	**70.1** Does the current traffic (every day and seasonal) along with the estimated traffic (light and heavy vehicle) generated by the proposed mine still fit within the capacities of the 2032 design horizon for urban and rural roads? (8.6 – Findings and conclusions)	**70.1** The existing road is not currently constructed to the required guidelines under the unsealed road design criteria (ARRB Unsealed Roads Best Practice Guide 2020). The new road design will meet the requirements of a Class 4A Main Road in accordance with the ARRB Unsealed Roads Best Practice Guide to satisfy the capacity level for a road that carries an average daily traffic (ADT) volume of greater than 150 vehicles per day. The proposed road upgrade will make traversing the road by existing users safer. The review and redesign undertaken by independent traffic consultants Tonkin Consulting provides that both the existing and additional traffic generated by the Proposed Development is minimal and that the improved road design will result in a positive outcome for all users. The detail provided to support these conclusions is in MP Appendix G, Traffic and Transport Assessment.
71. Carey Bros Family Trust	Section 8.4.2	Chapter 8 Traffic	Traffic	**71.1** In a 12-hour period with up to one HV every 10 minutes. Has a baseline traffic frequency been undertaken on this road? While you comment that the extra HV traffic would "increase total HV by less than 1%" is a generalization and not applicable to this unsealed Poochera Pt Kenny Road.	**71.1** Traffic count data for Poochera-Port Kenny Road was obtained from the DCSB, undertaken between 21 August - 28 November 2019. This was included in MP Appendix G, Traffic and Transport Assessment. Also refer to Submission ID 1.1 above.
72. Carey Bros Family Trust	Chapter 9	Chapter 9 Flora, Fauna, Pests and Native Vegetation, Appendix H6	Flora	**72.1** What about *Caladenia tensa* (Inland Greencomb Spider orchid) and *Prostanthera calycina* (West Coast Mintbush) – aren't these MNES (under the EPBC Act) nearby and potentially within the development area	**72.1** *Caladenia tensa* (Greencomb Spider-orchid) The PMST report identified Caladenia tensa (Endangered) as possibly occurring within 10 km of the Proposed Development Area. It was subsequently not observed within Proposed Development area. The most recent observation of the species was singular in 2003. *Caladenia tensa* generally occurs in dry woodland, Malleeheath, low scrub and about rock outcrops in a variety of soil types. Due to land cleared for agricultural purposes, and decades of cropping and grazing undertaken over the ML, it is highly unlikely to be present within the ML. *Prostanthera calycina* (West Coast Mintbush) See MP Appendix H6 Survey for West Coast Mintbush, Malleefowl And Dinosaur Ants. Refer to Submission ID 25.1. It must be noted that the native vegetation in the area of the Proposed Development is highly impacted by historical agricultural practices. Years of intensive cropping and grazing has significantly reduced the likelihood of MNES species. Areas bordering the ML area, that have had agricultural practices removed have seen some regeneration.
73. Carey Bros Family Trust	Section 9.4.4	Chapter 9 Flora, Fauna, Pests and Native Vegetation	Future land use	**73.1** What about the saline water applied to the site for dust suppression, as well as RO rejects and process water reject. What are the impacts to adjacent native (remnant remaining) vegetation as well as productive farming land?	**73.1** The saline water will be applied to formed roads, which will be rehabilitated and revegetated at the end of the mine's life. Dust suppression will be undertaken using directional sprays which face towards the ground. Proximal mist overspray which may occur would be at such low volumes and limited spread that it will not have any impact on adjacent land.
74. Carey Bros Family Trust	Section 9.5	Chapter 9 Flora, Fauna, Pests and Native Vegetation	Draft Leading Indicator Criteria	**74.1** Shouldn't all impacts have an indicator criterion - otherwise, how is the effectiveness of the proposed outcome and measurement criteria determined	**74.1** As outlined by the DEM's Terms of Reference 006 clause 4.2.4: "As required by Regulation 46(5), where there is a high level of reliance on control measures strategies to achieve an environmental outcome, provide a draft statement of leading indicator criteria that will be used to give an early warning that a control measure may fail or be failing".

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					The Company has proposed draft leading indicator criteria where this is the case.
75. Carey Bros Family Trust	Chapter 9.5	Chapter 9 Flora, Fauna, Pests and Native Vegetation	Draft Leading Indicator Criteria	**75.1** no disturbance to EPBC Act listed or NPW Act listed species?	**75.1** Leading indicator not proposed as it is not considered appropriate in this instance.
76. Carey Bros Family Trust	Chapter 9.5	Chapter 9 Flora, Fauna, Pests and Native Vegetation	Draft Leading Indicator Criteria	**76.1** no injuries or deaths (measured using an incident register)?	**76.1** Leading indicator not proposed as it is not considered appropriate in this instance.
77. Carey Bros Family Trust	Chapter 9.5	Chapter 9 Flora, Fauna, Pests and Native Vegetation	Air Quality, Flora, Fauna and native vegetation	**77.1 a)** What is 4 g/m2/month based on? **b)** What is the 2g/m2/month exceedance based on. What are the current standards? **c)** What is baseline. **d)** What happens if Andromeda exceed this and what measures are in place?	**77.1** a) See section 3 of Appendix K in the MP. The criteria proposed originates from NSW EPA. (2017). Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales. NSW Environment Protection Authority. b) The following points apply to the criteria: • The criteria refer to total insoluble matter, and not total solids. This is the matter that does not dissolve in water, and is determined in laboratory. • The 2 g/m^2/month criteria is used when baseline data on deposited dust levels exists, while the 4 g/m^2/month criteria is used when no baseline data exists. • The criteria refer to all sources of deposited matter (including sources from the mine, agriculture, unsealed roads, etc) and cumulative impacts. • The criteria provides for a business (agricultural business or mining business etc.) to be allowed to add a certain amount of dust to the atmosphere. The mine may therefore increase deposited dust levels by up to 2 g/m^2/month. However, the total deposited dust level (including sources from the mine, agriculture, unsealed roads, etc) must not exceed 4g/m^2/month. • A dust deposition rate of 4 g/m^2/month equates to a visible layer of dust on outdoor furniture or on a clean car deposited each month. c) For the purposes of the analysis established monitoring stations data have been used. The analysis is based on the fact that typically the air quality in the region is classified as very good and that the Proposed Development contributes to an increase in airborne particles. Baseline data is currently being collected and will be presented in the PEPR. d) As part of the *Mining Act 1971*, any breach of leading indicator or measurement criteria must be submitted to the Regulator. If the site is in breach of conditions granted by the ML, outcome or measurement criteria, the DEM are able to exercise the enforcement provisions listed in Part 10B of the Mining Act.
78. Carey Bros Family Trust	Section 11.3.5	Chapter 11 Groundwater	Potential Groundwater contamination	**78.1 a)** Groundwater contamination (from hydrocarbons) is not fully discussed here. **b)** Another impact not discussed is the impact of discharging saline water on the surface soils (maybe a surface water issue perhaps...)	**78.1** a)As with the requirements of all business undertakings, any hydrocarbon spills will be cleaned up and disposed of in accordance with the appropriate EPA legislation and regulations. A register will be kept and reported as part of statutory annual environment reporting. Ultimately, the area will be rehabilitated to a level that matches the future intended land use at the end of the mine life. A site contamination audit will be required prior to lease relinquishment. b) The saline water will be applied to formed roads, which will be rehabilitated and revegetated at the end of the mine's life. Dust suppression will be undertaken using directional sprays which face towards the ground. Proximal mist overspray which may occur would be at such low volumes and limited spread that it will not have any impact on adjacent land.

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79. Carey Bros Family Trust	Section 11.3.5	Chapter 11 Groundwater	Potential Groundwater contamination	**79.1** As stated earlier, some PAF may present in later stages. Please provide estimated volumes if available.	**79.1** Refer to Submission ID 23.1. The Acid and Metalliferous Drainage Assessment has been included in Appendix G.
80. Carey Bros Family Trust	Section 11.3.5	Chapter 11 Groundwater	Clarity	**80.1** not clear what this statement means?	**80.1** "None identified due to no credible pathway". This refers to the potential for a credible pathway when assessing the relationship between source-pathway-receptor. Pathway, as defined by DEM's guidance document MG2a: Preparation of a mining application for metallic and industrial minerals, is "the … means or route, with consideration of natural barriers, by which an environmental receptor can be exposed to, or may reasonably be expected to be impacted by, an identified source."
81. Carey Bros Family Trust	Section 12.1	Chapter 12 Air Quality	Stakeholder issues and concerns	**81.1** Also dust from processing is a concern.	**81.1** Dust has been identified as an issue concerning the community. Dust specifically generated from the processing plant will be managed as part of the Proposed Developments Dust Management Plan. Importantly, the proposed processing method is that the clay will be processed as a slurry. Water is added to the ROM ore and mixed prior to washing out the sand. Any transfer points prior to the washing section will also have dust controls.
82. Carey Bros Family Trust	Section 12.1	Chapter 12 Air Quality	Stakeholder issues and concerns	**82.1** At R1 and R2 and most of the other receptors, rainwater plays a big part in supplying homes with drinking water. Will rainwater tanks be guaranteed to be clean of any harmful dust particles?	**82.1** Andromeda recognises that dust deposition can cause nuisance affects and has committed to achieving an outcome of no public nuisance impacts from dust generated by mining activities. Dust management measures are described in Table 15-6 of the MP and include real-time monitoring. Given these measures, Andromeda considers dust will have negligible effect on water in rainwater tanks. The dust from the mine is very similar to dust from the local region and thus it will have no greater impact on rainwater tanks than presently experienced.
83. Carey Bros Family Trust	Section 12.1	Chapter 12 Air Quality	Stakeholder issues and concerns	**83.1** Our family business relies on all the land it farms to be able to make a profit. Losing 270 ha of both cropping and grazing land will affect our viability going forward especially when we don't know the impacts of dust on land adjoining the proposed development.	**83.1** All proposed air quality criteria have been based on legislative criteria including: • Environment Protection (Air Quality) Policy 2016 (AQEPP) • Approved Methods for the Modelling and Assessment of Air Quality in NSW' (NSW EPA 2017) (the Approved Methods). The Approved Methods include annual average TSP and dust deposition criteria which have been adopted to assess the potential for nuisance dust impacts associated with the Proposed Development. These criteria have been adopted by the SA Environment Protection Authority and sufficient study undertaken to ensure no adverse impacts to agricultural production can be expected. Predicted air quality modeling results are presented in 12.4.5 and 12.4.6, and further detailed in Appendix K of the MP. In regard to annual average dust deposition, the model predicts that the cumulative impact of predicted dust is approximately 50% of the criteria, where the Proposed Development is accountable for approximately 0.1 g/m^2/month, and background sources contribute to approximately 2.0 g/m^2/month. More detailed background data is currently being collected and will be presented in the PEPR. Additionally information on the impact of dust on crops and stock is included in Appendix B.

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84. Carey Bros Family Trust	Section 12.3.1	Chapter 12 Air Quality	Air quality monitoring	**84.1** Does this include having dust monitors at sensitive receptors with ongoing monitoring programmed.	**84.1** The Company currently has a live air quality monitor installed near the project site and are committed to installing a range of air quality monitors on a representative number of adjoining properties, as well as within the ML. The locations are to be confirmed through PEPR development on advice from air quality monitoring specialists.
85. Carey Bros Family Trust	Chapter 12.3.1	Chapter 12 Air Quality	Design measures	**85.1** Other options include spraying stockpiles with stabilizer and using stockpiles and revegetation 'belts' to buffer potential amenity impacts (dust, noise, light spill)	**85.1** Agree – the Company will be investigating various dust suppression agents for use onsite across stockpiles, haul roads, disturbed areas, etc. There has been significant success on other sites using hydromulching to reduce dust and erosion on stockpiles.
86. Carey Bros Family Trust	Section 12.3.2	Chapter 12 Air Quality	Dust management	**86.1 a)** Do Andromeda have contingencies plans for high wind days. What triggers dust suppression activities? **b)** Other options not considered may include, sensitive receptor site dust monitoring, quarterly window cleaning service	**86.1** a) It is recognized that high dust events regularly occur in the area, particularly on high wind velocity days. As with the neighboring businesses, creating dust and having topsoil eroded away by wind and covering fence lines is not desirable. A site-specific Dust Management Plan and Trigger Action Response Plan (TARP) will be developed during the PEPR. The purpose of a TARP is to provide the processes to identify conditions that may lead to dust impacts and to provide actions to avoid these impacts. It is likely the TARP will include air quality trigger values, meteorological trigger values, and visual observation trigger values. During extreme dust events the Company will continue dust suppression efforts. The Company will also be motivated to minimise dust generation to enable mining operations to be continued in an efficient and effective manner, and to prevent dust impacting the final product quality. b) Monitoring: See Submission ID 84.1. Other strategies, such as a quarterly window cleaning service can be discussed directly with landholders if they are considered to be within the area of influence.
87. Carey Bros Family Trust	Section 12.3.2	Chapter 12 Air Quality	Dust management	**87.1** what does "where appropriate" mean - when dust levels or wind levels reach a particular level. These actions need to be measurable.	**87.1** These levels will be determined and become measurable through the development of the PEPR, which will include the Dust Management Plan and TARP. "Where appropriate" means that management measure will be used where they are required to meet required regulatory outcomes, rather than on a continuous and ongoing basis. For example, as a primary dust control measure, a water cart will be used where appropriate to wet down work areas. During rain events, the use of a water cart will not be required so the water cart would not be used for dust suppression at that point in time.
88. Carey Bros Family Trust	Section 12.3.2	Chapter 12 Air Quality	Dust management	**88.1** 5th point - This should include dust management and monitoring plan. We want to see prepared (and have an opportunity to comment on a draft) a Dust Management Plan with specific measurable objectives and targets that can be monitored and tracked against threshold values. If threshold values are exceeded, this will trigger another series of contingency actions, which will also be specified in the management plan.	**88.1** The Company is currently working to develop the Dust Management Plan and TARP. These plans will be finalised during development of the PEPR. One of the issues that will arise through the measurement of dust is that it will become evident that dust is generated from surrounding areas. In extreme cases this dust may exceed the levels set out for the Proposed Development. Under these conditions the Dust Management Plan will be used to control dust generated onsite but cannot influence dust generation from external sources. The intention is to have a live dust monitoring system, which measures the dust levels into and out of the Proposed Development, those measurements will be reported quarterly as part of the compliance reporting framework.

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				As R1, we would like to have access to these data in real time, and be able to track dust levels (against background) and compliance against Management Plan objectives. Control measures that were used to develop the dust modelling, which resulted in compliance with criteria, must be incorporated into the Management Plan. Table 13 of Appendix F (Northstar Air Quality 2020) details the emission control factors that (we assume – please confirm) have been used in the dust modelling presented in the Mining Proposal. These control factors (as a minimum) must be implemented (not 'as required') and written into actions of the Dust Management Plan. For example, as per NPI (2012), as cited in Appendix F, topsoil removal and handling controls are based on soil that is naturally or artificially wet (Table 4 of NPI 2012). Table 13 also refers to Katestone (2011), and as such control measures cited from this document must be prescribed. Table 95 of Katestone (2011) states that 50% control (effectiveness) will be achieved through water sprays on ROM Pad and ROM bin. Given these references are cited in the Mining Proposal, it is expected that they will be adhered to in the Management Plan.	
89. Carey Bros Family Trust	Section 12.3.2	Chapter 12 Air Quality	Emission sources	**89.1** First point - Activity: Should this include PROCESSING as well? All activities within the extraction area (pit) and processing area.	**89.1** This activity (first point) is referring to modelling parameters applied with regard to emission sources to the mine pit (not processing area). The model has assumed control measures to be 50% effective (TSP) for control measures applied within the mine pit. The modelling was deliberately conservative, therefore in relation to the predicted outcomes the control measures adopted to reduce the impact will be more effective. By applying control measures that have positive outcomes on other similar project, either in mining or processing, confidence in the outcome can be presented.
90. Carey Bros Family Trust	Section 12.4.1	Chapter 12 Air Quality	Air Quality	**90.1** Table 12.4 lists the Volume of material of material to be removed per blast as between 3000t and 9000t. How will this impact the stone structures at R1?	**90.1** See submission ID 37.1.
91. Carey Bros Family Trust	Section 12.4.1	Chapter 12 Air Quality	Dust management	**91.1** Listed equipment - Is one water cart going to be adequate to do all the things listed in Vol 5 Appendix k, page 54. Section 7- Air Quality Mitigation?	**91.1** At this point in time, one is estimated to be sufficient. If two or more are required, The Company will obtain another for use to meet the applicable environmental outcomes as required by the ML Conditions.
92. Carey Bros Family Trust	Section 12.4.1	Chapter 12 Air Quality	Air Quality	**92.1** Will the crystalline silica concentrations be monitored to ensure no human health implications once construction commences?	**92.1** Maximum 3-minute silica concentrations are defined by the Environment Protection (Air Quality) Policy 2016 (Air EPP). Respirable crystalline silica (RCS) is conservatively predicted to be a maximum of 53.3 % of the relevant criterion at all surrounding receptor locations during Stage 1 operations. Stage 2 of the operation reduces to 35.4% from Stage 2 onwards (from 18 months to year 26). Air quality modelling undertaken for the Proposed Development has concluded that any change to air quality will be well within all legislative air quality criteria throughout construction and operation of the mine. This includes respirable particles, silica and nitrogen dioxide.

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					For this reason, silica is not proposed to be monitored at this stage, however, will be reassessed during the development of the measurement criteria for the Proposed Development. This will occur during preparation and submission of the PEPR document.
93. Carey Bros Family Trust	Section 12.4.6	Chapter 12 Air Quality	Dust emissions	**93.1** R1 is almost 3 times higher than the nearest sensitive receptor (R2). No comment is made about this in the impact assessment. Such a significant increase in the incremental impact should not be categorized as a 'minimal' impact (Table 12.11).	**93.1 - 96.1** While R1 is modeled at a higher level compared to the next nearest receptor it still remains well below the legislated and proposed levels. See Submission ID 97.1 below.
94. Carey Bros Family Trust	Section 12.4.6	Chapter 12 Air Quality	Dust emissions	**94.1** R1 is almost 3 times higher than the nearest sensitive receptor (R2). No comment is made about this in the impact assessment. Such a significant increase in the incremental impact should not be categorized as a 'minimal' impact (Table 12.12).	
95. Carey Bros Family Trust	Section 12.4.6	Chapter 12 Air Quality	Dust emissions	**95.1** R1 is almost 3 times higher than the nearest sensitive receptor (R2). No comment is made about this in the impact assessment. Such a significant increase in the incremental impact should not be categorized as a 'minimal' impact (Table 12.13).	
96. Carey Bros Family Trust	Section 12.4.6 s	Chapter 12 Air Quality	Dust emissions	**96.1** R1 is almost 3 times higher than the nearest sensitive receptor (R2). No comment is made about this in the impact assessment. Such a significant increase in the incremental impact should not be categorized as a 'minimal' impact (Table 12.14).	
97. Carey Bros Family Trust	Section 12.4.7	Chapter 12 Air Quality	Overview of potential impact	**97.1** This risk rating doesn't reflect the significant impact at R1, rather it is looking at the area more broadly. On average the sites are relatively low but R1 does not fit into this category based on the consequence tables described in the risk assessment. R1 risk management and mitigation needs to be treated separately as the incremental increase in dust to this site is much greater - to be fair. How will this impact be monitored and measured to ensure it is maintained at a 'minimal' level?	**97.1** To ensure clarity on the process, the nearest receptor, R1, is the primary focus of the potential impact and associated proposed management systems. All modeling and proposed outcomes have been developed to ensure that the impact to R1 is reduced to As Low As Reasonably Practical (ALARP). The term Minimal is a description that suggests an insignificant effect is expected. This is due to the Proposed Development predicted to contribute a maximum of • ~3% of the applicable criteria for Total Suspended Particulates (TSP) • <0.1% of the Annual Average PM2.5 concentration • <0.1% of the Annual Average Dust Deposition • ~12-40% of the Maximum 24-hour average PM10 concentration • ~6-11% of the Maximum 24-hour average PM2.5 concentration • ~1-53% of the Maximum 3-minute average silica concentration (see explanatory notes however in Submission ID 92.1) • ~2% of the Maximum 1-hour average NO_2 concentration, and • 0.1% of the Annual average NO_2 concentration. For the most part, the Proposed Development will contribute less than the existing background sources and provided the justification behind the impact assessment.
98. Carey Bros Family Trust	Section 12.4.7	Chapter 12 Air Quality	Overview of potential impact	**98.1** This Low impact value is not a true reflection of the impacts at R1 and is disingenuous to the family.	**98.1** See Submission ID 97.1.
99. Carey Bros Family Trust	Section 12.4.7	Chapter 12 Air Quality	Overview of potential impact	**99.1** Dust generation from mine operations and processing 0.8km from a residence, 7 days a week, 24 hours a day for 26 years is not short term or minor. How can a value that is only just compliant be given a minimal level of impact and be a Low risk? From our understanding this risk assessment is supposed to be based on the worst case - which is R1.	**99.1** As described above, the nearest receptor, R1, is the primary focus of the potential impact and associated proposed management systems. The evidentiary requirements set out in the Terms of Reference (006) are significant and all reasonable efforts have been made to understand the potential for impact to all receptors, as is required. The Company respects the opinion of the residents in R1 and have undertaken works to minimise the impact from the Proposed

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				This risk value of Low is not a true reflection of the impacts at R1 and is disingenuous to the family. Genuine mitigation attempts are required to reduce the dust impacts for RI so that it really is a Low impact value.	Development, however, the Company will always remain constrained by the location of the Great White deposit. See submission ID 97.1 in regard to the Proposed Development's contribution as compared to background sources. Where there are elevated percentages of PM2.5, PM10, TSP and Annual Average Dust Deposition against the proposed criteria, background sources are generally well in excess of the Proposed Development contribution. See all tables in Section 12.4 of the MP. See Submission ID 86.1 in relation to the development of a Dust Management Plan and TARP.
100. Carey Bros Family Trust	Section 12.4.7	Chapter 12 Air Quality	Table 12-16 Impact and risk summary: air quality	**100.1** How can a value that is only just compliant be given a minimal level of impact and be a Low risk? From our understanding this risk assessment is supposed to be based on the worst case - which is R1. This risk value of Low is not a true reflection of the impacts at R1 and is disingenuous to the family.	**100.1** See Submissions ID 97.1 and ID 99.1.
101. Carey Bros Family Trust	Section 12.4.11	Chapter 12 Air Quality	Control and mitigation strategies	**101.1** Other than water trucks, no controls are presented at all. Potential management actions have not been exhausted. Relief for the residence at R1 through buffering with noise attenuating bunds (long-term stockpiles) and planting, implement a monitoring program to maintain low values. This could also include introducing soil stabilizing spray to stockpiles, communication with local landowners during high wind days, house/ window cleaning service for close receptors etc.	**101.1** 12.3.1: Design measures outlined in the MP included: • Stockpiles and other dust generating sources located as far as reasonably possible from receptors. • Haul roads constructed with appropriate road base material. • Disturbance footprint kept to a minimum. • Dust suppression via appropriate design of final landform. 12.3.2: Control and management strategies outlined in the MP included: • Vegetation to be retained on-site where possible. Rehabilitation and revegetation to occur as soon as practicable. Progressive rehabilitation of the overburden landform to be undertaken during the life of the mine. • Minimise drop heights for material movements. • Use of water trucks and dust suppression agents, where appropriate, on unpaved roads or other exposed areas if required. • Ongoing maintenance of haul roads. • Dust management plan, including visual inspection of the overburden stockpile, and any evidence of nuisance dust generation and corrective actions undertaken documented and reported in annual environment reports. • Collected in-pit water from rainfall will be stored and used for dust suppression. • Vehicle speed limits will be managed in accordance with construction traffic management procedures and site conditions to mitigate wheel-generated dust. • Dust suppression via appropriate design of the final landform and the establishment of vegetation and potential crops. Soil stabilizing spray was considered to be included in the MP as "dust suppression agents" and could include hydro-mulching, which works to prevent and/or reduce wind erosion (dust) and water erosion. It is likely the TARP will include air quality trigger values, meteorological trigger values, and visual observation trigger values. Re: window cleaning. See submission ID 86.1(b) & ID 97.1.
102. Carey Bros Family Trust	Section 12.5	Chapter 12 Air Quality	Draft leading Indicator Criterion	**102.1** Many of the indicator criterion cells are blank. Is there a requirement for these to be populated?	**102.1** The indicator criterion is listed in Table 12-17. No columns/cells have been left blank in the table – however, some rows have split across pages.

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103. Carey Bros Family Trust	Section 12.5	Chapter 12 Air Quality	Table 12-17 Column 3, row 1	**103.1** It is not clear what the 4g and 2g values are based on	**103.1** See Submission ID 77.1.
104. Carey Bros Family Trust	Section 12.5	Chapter 12 Air Quality	Table 12-17 Column 3, row 3 Re: PM10	**104.1** Shouldn't the closest receptor (R1) be used as the indicator. If R1 is compliant then all other sites should be compliant.	**104.1** Monitoring locations are yet to be determined; however, it is likely that the location of the monitoring proposed for leading indicator and measurement criteria will be located in numerous locations onsite, at R1 and in multiple directions of the site.
105. Carey Bros Family Trust	Section 12.6	Chapter 12 Air Quality	Air quality impact control and management	**105.1** Does this mean that R1 is compliant at all times? Does minimal impact include R1 with a mine 800m away running 7 days a week, 24 hours a day for 26 years. **105.2** With 2 residences less than 3 km away, what are Andromeda proposing to do with these 2 closest receptors to reduce the impact?	**105.1** The modelling undertaken by independent consultants Northstar indicates that air quality at R1 is expected to be compliant against the proposed criteria during all stages. **105.2** Control measures have been included in Table 12-1 and Section12.3 of the MP.
106. Carey Bros Family Trust	Section 13.4.1	Chapter 13 Noise and Vibration	Predicted noise levels – construction Table 13.5	**106.1** If blasting and/or a rock breaker are going to be required, they should be factored into these tables and the noise model as they are extremely noisy. Information on frequency and duration of use should also be provided.	**106.1** A rock breaker is not anticipated to be required and was not included in the noise model for this reason. If a rock breaker is required at any time, the use of the rock breaker will comply with the requisite EPA standards. Noise from blasting is instantaneous, and measured in dB(linear). Criteria for blasting is adopted from AS2187.2.2006 Use of explosives and states all blasts must be less than 115 dBL at the nearest sensitive receptor for 95% of blasts per year, with a maximum of 120 dBL or higher limit as agreed with individual sensitive receptors. Based on this, preliminary maximum charge weights have been calculated, however, further modeling is required based on expected charge weights (currently undetermined, however, would be lower than maximum allowable under the standard). See Submission ID 33.1 regarding indicative blasting frequency and duration.
107. Carey Bros Family Trust	Section 13.4.1	Chapter 13 Noise and Vibration	Predicted noise levels - construction Control measures	**107.1** Exceeding noise criterion at R1 is not minor. Noise impacts need to be reassessed with R1 as the key indicator of consequence. What control measures are going to be investigated and implemented?	**107.1** The EPA have since provided further comment. See Government submission ID 43 and 44.
108. Carey Bros Family Trust	Section 13.4.2	Chapter 13 Noise and Vibration	Predicted noise levels – operations Table 13-9, Noise modelling	**108.1 a)** Does the model take into account that the ROM will be elevated 4m? **b)** R1 – Predicted noise level is exceeding noise limits in stage 2 **c)** R1 – Operation noise criteria is exceeding limits in stage 2	**108.1** a) See Submission ID 21.1. b) The EPA have since provided further comment. See Government submission ID 43 and 44. c) The EPA have since provided further comment. See Government submission ID 43 and 44.
109. Carey Bros Family Trust	Section 13.4.2	Chapter 13 Noise and Vibration	Predicted noise levels – operations Control and management strategies	**109.1** We are not satisfied with the rationale to use Part 4 of the Noise EPP relevant criteria, which is based on an average of the indicative noise factors for the source and receivers. This doesn't take into account the rural setting of the proposal area and the nature of the development. This is not an area that we have technical expertise in and we would appreciate some independent advice on this.	**109.1** The noise goals in the *Environment Protection (Noise) Policy 2007* are based on the zoning of the development and the closest noise affected premises in the relevant development plan. The land uses primarily promoted by the zones are used to determine the environmental noise criteria.

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				We believe that relevant criteria should be based on Part 5 of the Noise EPP, which is based on the following thresholds for sensitive receivers in a 'Rural Living' land use category: a) 47 dB(A) during the day, 7 am to 10 pm b) 40 dB(A) at night, 10 pm to 7 am We feel that the use of Part 4 criteria is disingenuous to the impact assessment process, as set out under the Guidelines for use of the Environment Protection (Noise) Policy 2007. By using Part 4 criteria, there is an increase in 10 dB(A) for day (57 dB) and night (50 dB) values, which allows the model as presented in the Mining Proposal to be compliant. This subsequently reduces the perceived risk, minimises the potential impact and negates the need for costly noise mitigation requirements. Regardless of Part 4 or Part 5 criteria, the proposed exceeds construction noise limits and as such requires more mitigations to reduce the risk.	The Proposed Development and R1-8 and R11-13 are located in the 'Primary Production' zone for which Rural Industry type land uses are primarily promoted. The EPA have since provided further comment. See Government submission ID 43 and 44.
110. Carey Bros Family Trust	Section 13.4.2	Chapter 13 Noise and Vibration	Predicted noise levels – operations Control and management strategies	**110.1** Has the use of buffering from permanent stockpile being considered?	**110.1** See Submission ID 31.1.
111. Carey Bros Family Trust	Section 13.4.2	Chapter 13 Noise and Vibration	Predicted noise levels – operations	**111.1** At R1 it is not a minor impact.	**111.1** Minor is described as: Local short term and minor surpass of air quality standard. This aligns with the potential impact as modeled.
112. Carey Bros Family Trust	Section 13.5	Chapter 13 Noise and Vibration	Noise and Vibration impacts	**112.1** There are some instances of non-compliant at R1. Not all receptors were in accordance with the EP (Noise) Policy.	**112.1** The Company is continuing to review and refine the Proposed Development to ensure that the *Environment Protection (Noise) Policy 2007* can be achieved at R1. This may include altering activities within certain timeframes, selecting alternative equipment, providing additional shielding of noise sources, and/or physical barriers on fixed plant where practicable. In order to operate, The Company must provide confidence to the EPA that these levels can be met. If the site is in breach of conditions granted by the ML, outcome or measurement criteria, the DEM may utilise the enforcement provisions listed in Part 10B of the Mining Act.
113. Carey Bros Family Trust	Section 13.5	Chapter 13 Noise and Vibration	Draft leading indicator criteria	**113.1** Indicator criteria to include: - Implementation of control measures as described previously (page 354). - Develop a noise management plan - Develop a noise and blast management procedure (work instructions)	**113.1** Leading indicator criteria is unable to be drafted to include the provision of control measures, but rather the measurement of the effectiveness of control measures.
114. Carey Bros Family Trust	Section 14.3.5	Chapter 14 Soil and Land Quality	Potential Groundwater contamination	**114.1** Does this include the planned saline water discharge from RO reject and process water reject?	**114.1** No, this section only addresses unplanned spills/leaks from chemicals and/or hydrocarbons. The saline water discharge will be recycled as dust suppression and only applied to formed roads, which will be rehabilitated and revegetated at the end of the mine's life. Dust suppression will be undertaken using directional sprays which face towards the ground. Proximal mist overspray which may occur would be at such low volumes and limited spread that it will not have any impact on adjacent land.

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115. Carey Bros Family Trust	Section 14.4	Chapter 14 Soil and Land Quality	Draft leading indicator criteria	**115.1** Indicator Criteria to include regular soil testing in and around the site	**115.1** The Company will consider the provision and location of a regular soil testing program as a leading indicator during the development of the PEPR.
116. Carey Bros Family Trust	Section 15.5	Chapter 15 Visual Amenity	Draft leading indicator criteria	**116.1** Indicator Criteria to include implementation of design measures (from section 15.3.1).	**116.1** Leading indicator criteria is unable to be drafted to include the provision of control (design) measures, but rather the measurement of the effectiveness of control measures.
117. Carey Bros Family Trust	Appendix K	Volume 5 Appendix K Air quality mitigation	Air Quality	**117.1** How are these levels of find dust deemed to be acceptable for affected nearby landholders, the community and the environment?	**117.1** Fine particulate matter is defined as particles that are 2.5 microns or less in diameter (PM2.5). The Proposed Development is predicted to contribute a maximum of: • <0.1% of the Annual Average PM2.5 Concentration • ~6-11% of the Maximum 24-hour average PM2.5 concentration Applicable regulatory criteria are set by the EPA through the Environment Protection (Air Quality) Policy 2016 (AQEPP) under Section 28 of the Environment Protection Act 1993. For the most part, the Proposed Development will contribute less than the existing background sources and provided the justification behind the impact assessment. All air quality modeling indicates the Proposed Development will be able to operate within the applicable air quality criteria.
118. Shaun and Patrea Carey	Section 2.5.1	Chapter 2 Description of Existing Environment	Potential Acid Mine Drainage	**118.1** Exactly how much Potential Acid Forming (PAF) material is there within the site and how will it be managed to ensure there no risk, from potential Acid Mine Drainage, to surrounding land?	**118.1** Refer Submission ID 23.1. The Acid and Metalliferous Drainage Assessment has been included in Appendix G.
119. Shaun and Patrea Carey	Section 2.7	Chapter 2 Description of Existing Environment	Water runoff & Erosion	**119.1** The potential mine site sits above our cropping land bordering to the east and significant stockpiles of soil and overburden are planned along our boundary. What strategies is Andromeda proposing to mitigate the potential of water runoff and subsequent erosion of lower lying areas especially our neighboring paddocks, due to the increased elevation caused by their stockpiles?	**119.1** During exceptional rain events where there is sufficient rainfall to collect on surface and run off within the mining area, water will be directed using drains and bunds. The site will be designed to ensure that any drainage from mining areas does not leave the Mining Lease with water retained on site. Final design parameters will be included in the PEPR. The Project has proposed the outcome of • no contamination of land and soils either on or off the Land as a result of mining operations; and • No contamination of land and soils either on or off the Land post-mine completion occurs as a result of mining operations. This can be expanded to include no impact from erosion caused by the Tenement Holder. For example, water runoff from overburden stockpile is managed in two ways. Initially, prior to reshaping and rehabilitation of the stockpile, water will predominantly be absorbed into the loose rock fill. If, in the unlikely situation water does collect and pool on this material to then flow and promote erosion, the water flow will be stopped by soil bunded around the base of the overburden stockpile. Once the stockpile has been reshaped and rehabilitated the resultant landform will be designed and sloped appropriately to prevent water channeling and erosion. To ensure erosion impacts from the Proposed Development are as low as practical, standard industry erosion practices will be implemented during construction, operation and rehabilitation. More site-specific measures will be identified in a Construction Environmental Management Plan, which will be outlined within the PEPR.

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120. Shaun and Patrea Carey	Section 2.8.2	Chapter 2 Description of Existing Environment	Presence of West Coast Mint Bush	**120.1** According to proposal a 2020 spring survey indicates there is no West-Coast Mintbush found in the vicinity of the area. The survey consisted of 3 transects greater than 3km. Given the proposed development area is only 410ha, how can this survey confidently exclude the possibility that there is Mint bush within the development area? We would suggest a more targeted search should have been conducted to ensure accuracy in the determination that there is none in the area, and therefore accuracy in defining the impact the mine site could have to the natural environment.	**120.1** Refer to Submission ID 25.1. Due to land cleared for agricultural purposes, and decades of cropping and grazing undertaken over the ML, it is highly unlikely to be present within the ML. However, there is scope for the West Coast Mintbush to be propagated and re-established as part of mine closure planning.
121. Shaun and Patrea Carey	Section 2.12.4	Chapter 2 Description of Existing Environment	Lack of recognition of loss of cropping land to the landholder	**121.1 a)** The proposal states the development includes approximately 162ha of cropping land which has been owned and worked by the same family for approximately 100 years. What percentage is 162ha of the landholder's total cropping area (rather than the entire EP)? Not including more specific data is diminishing the impact the loss of cropping land will have on those family enterprises.	**121.1** a) The Company recognises that the Proposed Development's positive economic impact to the region and South Australian economy will have a negative impact to the immediate landholders if not compensated appropriately. Resultantly, affected landholders will be compensated for the loss through negotiated confidential terms. The Company does not analyse all of the information regarding assets/land holdings owned by the primary landholders and active under cropping. As outlined, affected landholders will be compensated for the loss through negotiated confidential terms. The Company is conscious of not including detailed information for publication on the private assets of identifiable landholders within the ML application. The Company will continue discussions with the landholders.
122. Shaun and Patrea Carey	Section 2.13.1	Chapter 2 Description of Existing Environment	Dust Impacts not mentioned in relation to housing	**122.1** What about dust impacts for sensitive receptors?	**122.1** Air quality impacts are included in Chapter 12 of the MP
123. Shaun and Patrea Carey	Section 2.13.1	Chapter 2 Description of Existing Environment	Incorrect– Proposal states there are no private pipelines within the proposes development	**123.1** On our property within the boundary of the proposed development we currently have a pipeline, small tank and water trough. This is the only water source for stock in that entire paddock. This water source will have to be relocated to an alternative location within that paddock if Andromeda successfully acquires that portion of land.	**123.1** The Company is currently negotiating with landholders for the purchase of the required land. This pipeline, small tank and water trough will form part of ongoing negotiations.
124. Shaun and Patrea Carey	Section 2.18	Chapter 2 Description of Existing Environment	No mention of vegetation heritage agreement areas	**124.1** As shown in figure 2-37 there is a number of vegetation heritage agreements in close proximity to the mining lease. Will there be any impacts to these areas?	**124.1** Outside of a small area of direct clearance within land subject to Native Vegetation Heritage Agreement (HA 511), there is not expected to be any impact on any other Native Vegetation Heritage Agreement areas. In regard to the clearance within Section 15 of H651000 subject to HA 511, this is due to the mine access road. From the Poochera-Port Kenny Road, the proposed access road heads west to the ML, south of the northern boundary of Section 15, through historical disturbance and open grassed vegetation. This location avoids impact on the adjacent landowners' cropped areas. The road then crosses into private land north of the boundary, avoiding the more densely vegetated areas of Section 15, and ultimately providing access to the plant location. The proposed route balances impact on productive land and native vegetation and was selected after significant consultation with the direct landholders, and DEW as lease holders of the Crown owned parcel covered by HA 511 - Section 15 of H651000.

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125. Shaun and Patrea Carey	Section 3.1	Chapter 3 Description of the Proposed Development	Hours of operation	**125.1** Proposal states mining will be limited to day shift. What are the shift hours and operating days? Do these same hours and days apply to trucking out of materials prior to processing plant being in operation?	**125.1** Refer to Submission ID 30.1. Stage 1 product transport (24 HV movements) is expected to be undertaken during the hours of 7am to 7pm every day, while Stage 2 product transport (10 HV movements) is expected to occur over the 24 hour time period as required, as processing is proposed to occur 24 hours per day.
126. Shaun and Patrea Carey	Section 3.1.1	Chapter 3 Description of the Proposed Development	Diesel powered generators to be utilised	**126.1** How many generators to be used? What are operating times? How much noise will be generated when in use?	**126.1** See Submission ID 45.1 (a).
127. Shaun and Patrea Carey	Section 3.1.1	Chapter 3 Description of the Proposed Development	Stage 1 supply of water through road tankers	**127.1** How many? Has the Increase in road traffic been accounted for when considering impacts?	**127.1** There was an error in the volume of water provided for the use in Stage 1 in the ML. The calculated volume was based on 10 loads of a B-double water truck at nominally 50,000 l per trip equating to 500 kl of water not the 50 kl as stated in error in the MP. A demand of ~2.7 l/s of water or around 250 kL/day will be required for Stage 1 mining and 250 kL/day for road construction and dust suppression.
128. Shaun and Patrea Carey	Section 3.1.1	Chapter 3 Description of the Proposed Development	Potential impact on water supply to existing SA water customers	**128.1 a)** What measures will be put in place to ensure the already strained supply to existing customers is not impacted? **b)** In the event that supply is impacted what strategies will be enacted to compensate for those impacts?	**128.1** a) and b) SA Water have responded to questions raised regarding water supply and reliability, this has been included in Appendix A.
129. Shaun and Patrea Carey	Section 3.1.1	Chapter 3 Description of the Proposed Development	Water conservation and dust suppression	**129.1 a)** What strategies and products does the applicant plan to use for water conservation and dust suppression? **b)** Why is paving the roads not a priority method given the amount of daily traffic expected, limited water resources available and average rainfall of the area?	**129.1** a) Water will be reused and recycled at every available opportunity and conserved where possible. This includes: - using water retrieved from the mine pit for dust suppression when available - The condenser in the drying facility (processing plant) collects water for reuse - water storages will be covered to reduce evaporation wherever possible - Brine produced as part of the reverse osmosis plant will be used for dust suppression on formed roads. Dust suppression products, such as binding agents and hydro-mulching opportunities, which are available on the market will be determined prior to and during operations. b) Refer Submission ID 1.2.
130. Shaun and Patrea Carey	Section 3.1.1	Chapter 3 Description of the Proposed Development	Mining – operations machinery & blasting details	**130.1 a)** According to the proposal for the "majority" of mining no drill or blast is required. What quantifies majority? **b)** Over the course of the mine life how often will drilling and blasting techniques be used (defining as no more than once a month is indistinct)? **c)** Will a rock breaker be used?	**130.1** a) Refer Submission ID 33.1. For further context, of the 38,575,986 bank cubic metres of material proposed to be mined over the course of the Proposed Development, less than 5% is estimated to require drilling and blasting. b) Refer Submission ID 33.1. c) A rock breaker is not anticipated to be required. If a rock breaker is required at any time, the use of the rock breaker will comply with the requisite EPA standards.
131. Shaun and Patrea Carey	Section 3.1.1	Chapter 3 Description of the Proposed Development	Lack of detailed Rehabilitation plan	**131.1** As the mine is refilled with topsoil how will the area be revegetated? What is planned species and density of planting?	**131.1** Refer Submission ID 34.1.

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					For further context, revegetation trials will commence in the early stages of the Proposed Development and a detailed rehabilitation plan including species type and planting density will be developed to satisfy the requirements of providing a safe and stable landform for mine closure.
132. Shaun and Patrea Carey	Section 3.1.1	Chapter 3 Description of the Proposed Development	Location of dewatered sand stockpile	**132.1 a)** This stockpile is not indicated on figure 3-1 (pg108) Where is it to be located? **b)** What are the anticipated dimensions of this stockpile? **c)** What strategies will be used to prevent sand drift, especially during hot dry summers with strong northerlies?	**132.1** a) Sand loading is shown on Figure 3-18. b) Approximately 2,180 tonnes. c) The sand moisture content is expected to be at least 10%. Control of sand drift is an issue across the region, particularly during hot dry weather with strong wind. The sand stockpile will be small, and in proximity to the processing plant. The concern for the operation is around protecting the refined kaolin product from sand drift, and all dust sources, as sand drift and dust has the ability to impact product quality.  **Figure 2: R3 exposed to existing dust conditions (Monday 7 June 2021 2:00 pm)**
133. Shaun and Patrea Carey	Section 3.2.4	Chapter 3 Description of the Proposed Development	Local employment figures	**133.1 a)** The proposal states at peak there will be 75 FTE on site per year including haulage. Given within the local district many businesses are struggling to find employees. Where are these proposed employees coming from? **b)** What "local" company has the capacity to supply the numbers of heavy vehicles required for haulage?	**133.1** The Company cannot comment on the current employment opportunities, or the difficulties related to attracting people into existing positions and into existing local businesses. The Company expect there will be a number of local people currently employed on a FIFO/DIDO basis on other mine sites looking to find a residential opportunity closer to home. Additionally, training of local residents is anticipated and many of the roles in the Proposed Development will not need previous experience or education. It is expected that some locals will move between employers in the region, some people will take the employment opportunities at the Proposed Development, and in time trained people may choose to leave the Proposed Development for other employment opportunities in the region. It is anticipated that the potential employees that relocate to the region will have partners and family that will fill positions available outside of the Proposed Development. The commercial impact of salaries paid to employees will have a positive impact on local service businesses and build their individual capacity to provide for the greater community. Within the DCSB, there are currently approximately 20 people working in the mining industry, as well as the following within relevant industries (industries which have highly transferable skillsets). Between this, as well as families looking to move into the area, the Company consider it possible to obtain the requisite number of employees to fill roles.

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					Industry / Total working within industry **Mining** 19 **Manufacturing** 28 **Electricity, Gas, Water and Waste Services** 10 **Construction** 72 **Transport, Postal and Warehousing** 31 **Information Media and Telecommunications** 4 **Financial and Insurance Services** 6 **Professional, Scientific and Technical Services** 24 **Administrative and Support Services** 18 **Public Administration and Safety** 35 **Education and Training** 82
134. Shaun and Patrea Carey	Section 3.3.2	Chapter 3 Description of the Proposed Development	Continued exploration throughout the development	**134.1** Will we, as one of the current landholders of the proposed development, be subjected to interruptions of continued explorations on our remaining properties for the entire duration of the mine life and beyond?	**134.1** Refer Submission ID 11.1.
135. Shaun and Patrea Carey	Section 3.4.5	Chapter 3 Description of the Proposed Development	Location and size of stockpiles	**135.1** Figure 3.7 (pg135) fails to clearly indicate locations of the varying stockpiles. Where will the following stockpiles be located on site and what size will they be? ~ Topsoil ~ Subsoil ~ Product stockpile to support processing ~Calrete for road construction ~ Silcrete for road ramp & pit floor	**135.1** See Section 3.4.5 of the MP. Volumes are expected to be as per Table 3-12 of the MP (page 138). • Topsoil stockpiles will be in the areas labelled soil and will be up to 2 metres high. • Subsoil stockpiles will be in the areas labelled soil and will be up to 5 metres high. • ROM stockpiles – 75,000 tones. See MP Figure 3-18 – "ROM Pad" • <u>Stage 1</u> o Calcrete and silcrete will be stockpiled on the ROM pad as per MP Figure 3-18. o This is while the DSO is stockpiled on the DSO stockpile (product area to south labelled as kaolin product bagging). o Up to 50,000 tonnes calcrete/silcrete crushed/screened as required for road construction during Construction and Stage 1 operations. • <u>Stage 2</u> o Calcrete and silcrete will stockpiled on product loadout for ongoing maintenance of roads (~15,000 tonnes – 50 x 50 metres x 5m high) once DSO ceases. • Other materials outside of these stockpile requirements are considered overburden.
136. Shaun and Patrea Carey	Section 3.4.5	Chapter 3 Description of the Proposed Development	Size of overburden stockpile and potential erosion	**136.1** ***a) How*** will AM ensure that such a large stockpile (18m high) will not cause any erosion and sediment loss from surface runoff and wind? **b)** Water movement through the stockpile is expected to be limited, how does this quantify? **c)** Does AM have rainfall data specific for the site? **d)** What is the average rainfall of the area?	**136.1** a) The Company has committed to ensuring the final design of all stockpiles to minimise erosion and sediment loss due to surface runoff and wind action. This final detailed design will be developed and provided as part of the PEPR. b) Water movement through the stockpile is classified as limited as a result of the overall Köppen climate classification of the area as Hot-summer Mediterranean/Cold semi-arid. The area experiences winter rains (average 326 mm/annum) and hot dry summers which have evaporation rates (2,000mm to 2,400mm/year in excess of the annual rainfall (BOM, 2021). With the evapo-transpiration cycle in these climatic zones, the level of water influx through soils is minimal on an annual basis. Some exceptions occur where a wet season can contribute to positive influx. The soil moisture situation can be measured through the summer by testing for ground moisture content. Test holes excavated to test moisture levels in November to February are typically very dry. In addition to the basic rainfall water balance, Research by the CSIRO has

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					shown that over the past 20 years there has been a decline in rainfall across south eastern Australia. There has been a declining trend in rainfall over the past 20 years in the Eyre Peninsula region, with the decline being more prominent in the drier areas where the Proposed Development is located. Records show that in combination with the reduced rainfall over the same 20-year period there has also been an increase in the average annual maximum temperature (Department for Water, 2011). c) The Company has installed a meteorological station in November 2020. A rain gauge was added in February 2020. Other data used in assessments has been obtained from Poochera (Station Number: 18068), located approximately 15 km northeast of the Proposed Development. While it is recognised that there is some variation in rainfall between the Poochera Station and the Proposed Development, the BOM data provides a significant long-term dataset (that is, data collected since 1919) which was used in scientific analysis and subsequent environmental modelling. d) Climate and Rainfall for the Proposed Development was provided in section 2.2. According to BOM records, Poochera (Station Number: 18068) experiences an average rainfall of 326 mm per year (1919-2019) dataset). Other regional BOM weather stations record rainfall and are as follows: • Karcultaby (Station Number: 18036) has an average rainfall of 308 mm per year • Minnipa (Station Number: 18195) has an average rainfall of 277 mm per year • Streaky Bay (Station Number: 18079)has an average rainfall of 318 mm per year. • The Port Kenny (Mount Cooper) area is 36.8 kms south of Poochera and is in a higher rainfall zone, and has an annual rainfall of 427 mm ((Station Number: 18054).
137. Shaun and Patrea Carey	Section 3.4.5	Chapter 3 Description of the Proposed Development	Rehabilitation of the Overburden stockpile	**137.1 a)** Is the rehabilitation of the overburden stockpile ongoing during the mining operations or a post mining plan? **b)** Will the overburden remain post mine? If so at what size? **c)** How does a ***"vegetative cover of grasses"*** equate to the current natural environment?	**137.1** a) The overburden stockpile will be revegetated as soon as practicable (during operations). b) The overburden stockpile will be an irregular shape but is expected to be approximately 550 m long, 300 m wide and 18 m high. c) The DEM have expressed a preference for *Austrostipa* to be prioritised as one of the predominant grasses. Vegetation associations within the ML include Grassy Open Mallee Woodland. See Appendix H1.
138. Shaun and Patrea Carey	Section 3.4.5	Chapter 3 Description of the Proposed Development	ROM stockpile	**138.1** Does the noise assessment consider the ROM is 4m above ground level?	**138.1** See Submission ID 31.1.
139. Shaun and Patrea Carey	Section 3.4.6	Chapter 3 Description of the Proposed Development	Frequency of explosives use	**139.1 a)** What is the frequency of blasting? Is it monthly or quarterly? How many blasts in a single period? **b)** Will a *blast management procedure plan* be in place to describe what the operations need to do prior to, during and after blast? Will this be accessible for the immediate and neighbouring landowners? How much notice will the landowners receive prior to blasting? **c)** How will the impacts to infrastructure associated with blast vibrations be monitored?	**139.1** a) Refer Submission ID 33.1. b) Refer Submission ID 33.1 and 37.1. c) Refer Submission ID 37.1. d) and e) Refer Submission ID 37.1. Blasting will be designed to comply with AS2187.2.2006. Regardless, as the distance from the mine site to the nearest residence (800 m) is significantly greater than 100 m, it is likely that all vibration during construction activities and operation of the

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				d) Will Andromeda undertake assessment of local infrastructure specifically homes and sheds, to determine a baseline prior to implementation of any blasting and subsequent monitoring? **e)** A large concern to us is the potential structural damage over time to our very solid 50 year old double brick home located approximately 3.5km away and also the 2 older but very well maintained stone homes within closer proximity. How can we ensure that the mining company is held accountable if damage does occur as a result of blasting operations?	mine will be within the nominated criteria – that is, vibration levels caused by blasting are less than 5mm/s peak particle velocity at the nearest sensitive receptor for 95% of blasts per year, with a maximum of 10 mm/s peak particle velocity for any one blast (unless agreed with receptor). This criterion is conservatively based on human comfort, rather than to prevent structural damage. Energy will dissipate over distance as per the laws of thermodynamics and combined with the low transmissibility of the degraded overburden and distance, the vibrations generated from the blasting event will be in compliance with AS2187.2.2006. During the PEPR, modelling to determine final charge weights will be completed, and if a structure is determined to be within the area of influence, the Company will work with the landowner to determine the most appropriate way to capture baseline data (existing structural conditions). Additionally, if the site is in breach of ML conditions, outcome or measurement criteria, the DEM may utilise the enforcement provisions listed in Part 10B of the Mining Act.
140. Shaun and Patrea Carey	Section 3.4.8	Chapter 3 Description of the Proposed Development	Mine Dewatering – collecting of water during high rainfall events for use in dust suppression	**140.1 a)** On page 139 it was suggested that the site received ***"limited rainfall"*** therefore no erosion from stockpiles, yet now the proposal is stating that during ***"high rainfall"*** events water will be collected and stored. Each point is contradicting the other. **b)** How will the collected water be stored? **c)** Has a collection sump been factored into the footprint? **d)** How much water is needed for dust suppression on site?	**140.1** See section 3.7.8 of the MP. The two statements relate to separate issues. Limited rainfall relates to the overall climatic conditions in the area, semi-arid compared to a tropical climate. Within the low annual rainfall distribution, there is likely to occur the potential for high rainfall events. These events, added to all of the other rainfall events experienced over the year, to date have added up to a limited overall rainfall. a) Poochera has an average rainfall of 326 mm per year. This is considerably low. This is however different from a singular rainfall event, which can generate considerable runoff over a short time frame. b and c) Stormwater ponds have been included on the eastern and western boundaries of the processing area, as shown in Figure 3-18. They have been nominally sized at 40 m x 12 m to manage a 1% AEP event. Run-off from undisturbed areas will be diverted using bunding around disturbed areas into the natural drainage lines and discharged in a way that minimises velocity and prevents erosion. Where necessary, erosion control measures including haybales, silt fencing and erosion logs would be utilised. All release of stormwater or run off offsite is expected to be managed in order to comply with the Environment Protection (Water Quality) Policy 2015 (SA). Hydrologic modelling is expected to be completed through final construction design to determine peak flows and potential runoff volume, in order to finalise design which is capable of handling storm events up to a 0.5% AEP. This would be completed in order to convey stormwater under or over the access road, divert stormwater around the open pit and safely retain external flows within and/or upstream of the open pit, during operations. In pit rainwater will be pumped to surface to stormwater ponds for storage and later use as dust suppression. d) Refer to Submission ID 45.1 (b).

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141. Shaun and Patrea Carey	Section 3.4.9	Chapter 3 Description of the Proposed Development	Sequence of mining and rehabilitation operations	**141.1 a)** A safety bund may be established around the area where the pit was, what will this look like? How big will it be? Will it be vegetated? The closure post mine has not been adequately described raising many questions. **b)** Will there be a pit void remaining? **c)** What proportion of site will be returned to native vegetation? **d)** What, if any, is returned to pasture and/or usable arable land? **e)** Is there a detailed rehabilitation plan in conjunction with this Mining Proposal?	**141.1** The safety bund referred to in section 3.4.9 of the MP will be constructed with a long-term design specification and will be left in place at the end of the mine life to protect from uncontrolled access to any remaining pit void. The Proposed Development describes a continuous backfill system, where when one section of the mine is completed, it will be backfilled with the subsequent overburden and sands. There is the potential through detailed closure planning that a closure safety bund may not be required, as the vast majority of the mine will be backfilled with overburden and sands from progressive rehabilitation completed through the operational phase of the mine. Where a pit is left from the final stages of mining, the void may be contoured/rehabilitated so that a vehicle will be able to safely traverse the area. This detail will be completed as part of the detailed mine closure planning within the PEPR. In the event that the remaining mine void is not suitable for a vehicle to safely traverse the area, a closure safety bund will be installed as per the guidelines issued by the Western Australian Department of Industry Resources (DIR 1997). The bund would be vegetated. a) The safety bund will have final design specifications verified through the life of mine. It will be vegetated. b) Refer Submission ID 41.1 c) Refer Submission ID 34.1. d) Refer Submission ID 34.1. e) A MP is generally conceptual in nature and the PEPR provides the detail. The full rehabilitation plan will be provided in the PEPR.
142. Shaun and Patrea Carey	Section 3.4.10	Chapter 3 Description of the Proposed Development	Operating hours on site	**142.1 a)** What are the processing operating hours? **b)** Does mining activities, day shift Monday to Saturday, include haulage of product prior to processing plant becoming operational? **c)** Is there a safeguard to ensure mining activities cannot ever be extended to 24hrs 7 days a week once processing begins on site?	**142.1** a) Refer Submission ID 30.1 b) Yes. Stage 1 operations (first 18 months) does not include a processing plant, but includes the direct shipping or ore (DSO), at approximate 24 loads per day. This reduces to 10 loads per day during Stage 2 operations (from 18 months onwards to the end of mine life – year 26). c) If the Company were to consider extending mining hours, a Change in Operations notice would need to be submitted to the Department for Energy and Mining and any impact from this assessed appropriately. This would likely include further community and landholder consultation.
143. Shaun and Patrea Carey	Section 3.5.2	Chapter 3 Description of the Proposed Development	Processing plant operation times	**143.1 a)** The plant will operate continuously with assumed operation of 8000 hours per year at 91.3% utilisation. What will occur during the remaining 8.7% of the year? **b)** What noise is associated with the operation of processing plant?	**143.1** a) The remainder of the time assumes plant maintenance – both scheduled and/or unplanned maintenance requirements. b) Specific sound power levels for components of the processing plant have been detailed in *Table 14 Mobile plant—operation* in Appendix L. The outcome of the predictive noise model which uses these sound power levels is detailed in *Table 17 Predicted worst-case operation noise levels – all operation plant (includes +5dB characteristic penalty)* and *Table 18 Predicted worst-case operation noise levels – process plant only (includes +5dB characteristic penalty)*.

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144. Shaun and Patrea Carey	Section 3.5.4	Chapter 3 Description of the Proposed Development	Process water management	**144.1** It has been stated previously that mining will not occur below the water table and there will be no dewatering so what is the source of the groundwater that may be recovered?	**144.1** The majority of pit excavation mining will occur above the water table (i.e. in unsaturated conditions). This is overburden of the Bridgewater and Garford Formations. Groundwater seeping into the pit from saturated portions of the Garford Formation and Kaolinised Granite will evaporate off, with any water remaining being diverted to sumps and used for dust suppression. Dewatering (water being pumped to surface from sumps) is only expected from pit 5 onwards (year 5). Detailed information on dewatering rates and impact is presented in MP section 3.4.8 and Chapter 11.
145. Shaun and Patrea Carey	Section 3.5.8	Chapter 3 Description of the Proposed Development	Rehabilitation strategies	**145.1 a)** Why has a detailed rehabilitation plan not been included with the mining proposal? **b)** Proposal states that further treatment will be determined in the lead up to closure based on "*economics, best practice and technology*", what does economics have to do with rehabilitation? How will the mining company be held accountable to rehabilitate the site as close as possible to the natural landscape? Who determines that rehabilitation is done to an acceptable level?	**145.1** a) A MP is generally conceptual in nature and the PEPR provides the detail. The full rehabilitation plan will be provided in the PEPR. b) The closure conditions required at the end of the mine life generally have to meet the requirements of being safe and stable in perpetuity. There is not a requirement to rehabilitate the site to as close as possible to the natural landscape. Rehabilitation is defined by the DEM as the return of disturbed land to a state agreed by relevant stakeholders and defined in the PEPR. The DEM will ensure that the Company is held accountable for the rehabilitation of land. Further, a rehabilitation liability bond will be calculated by the Company, and verified by the DEM. This agreed amount must be paid by the Company prior to the commencement of any operations (including construction). Among other things, the bond will be held to ensure that the present and future obligations of the Company in relation to the rehabilitation of land disturbed by authorised operations. There are a variety of penalties and enforcement provisions throughout the *Mining Act 1971* that may be imposed by the DEM should the Company not comply with its obligations.
146. Shaun and Patrea Carey	Section 3.6.2	Chapter 3 Description of the Proposed Development	Disposal of salt from processing	**146.1 a)** How does "some salt" being returned with sand to the pit quantify? Will this salt pose a risk to salinity levels in surrounding soils? How will The Andromeda ensure salt does not affect soil quality of neighbouring cropping land?	**146.1** The Company can implement control measures to ensure that salt returned to the ground as a result of backfilling and mining operations does not further exacerbate the current existing conditions. It is recognised that there are existing natural levels of salt in the soils and overburden of the area. This is more evident in dry years and can be observed in the aerial photographs of the region, where higher salt levels result in lower crop density. It is evident the salt is currently already affecting the quality of neighbouring cropping land. The salt returned with the backfilled material is any salt that has been removed with the sand and clay in the first instance. This salt will be mixed in the overburden backfill. This material will be enclosed within the mine area and during rehabilitation, covered with the topsoil that was stripped as part of the pre-strip. These soils are the same soils that were removed without any of the sand or overburden. Andromeda will ensure that any material from the mine is not released from the site.
147. Shaun and Patrea Carey	Section 3.7.1	Chapter 3 Description of the Proposed Development	Access roads remaining unsealed	**147.1 a)** Given the amount of traffic the mine site with generate on a daily basis, especially with haulage of product predicted to be 24 trucks per day in the first stage, how can Andromeda justify not sealing the roads? **b)** ~ How will the roads be maintained to an appropriate standard for public access? **c)** ~ How can Andromeda guarantee the safety of other road users sharing the road with such a large number of vehicles daily? **d)** ~ How regular would patrol grading and re-sheeting occur?	**147.1** a) Refer Submission ID 1.1 and 1.2. b) Refer Submission ID 1.2. c) Refer Submission ID 1.2. d) The Company has committed to upgrading and maintaining the road as part of the Proposed Development. The works will be undertaken by suitable qualified operators, and contracts are

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				e) ~ Who would be undertaking this works? Current road maintenance is undertaken by the Streaky Bay District council. We strongly feel this extra works should not be added to their existing road maintenance program given the below par condition many of the district's unsealed roads are kept in due to lack of resources. **f)** ~ Does the proposal take into consideration that grading and re-sheeting also poses significant interruption to road users?	yet to be tendered and subsequently awarded. While the Company will fund the works, suitable service providers and works will be done in consultation with the DCSB and the DIT. The frequency will be guided by an appropriate monitoring program, also completed in consultation with the DCSB. e) The Company will be maintaining the road in negotiation with the DCSB. f) All changes and developments require a level of interruption, in this case interruption to road users has been considered. The interruption to users will mainly occur during the construction period and the Company will work with the DCSB to limit interruption as far as feasible for local road users. The improvements to the road will provide a long-term safer road that will return positive attributes that outweigh the short-term inconvenience. The Company will continue to fund and work with the DCSB to maintain the Poochera-Port Kenny Road throughout the Life of Mine to a safe and operable standard and ensure upgrades will make the route safe for the operation of trucks and safer for the wider community. This includes working with the DCSB regarding road maintenance programs and any associated short-term road closures which may be required over the mine life. Like all road users, all traffic associated with the Proposed Development must comply with the law to ensure safe operation of vehicles and equipment. This includes any interactions with slow moving vehicles, local farm traffic and oversized machinery such as harvest heavy vehicles.
148. Shaun and Patrea Carey	Section 3.7.3	Chapter 3 Description of the Proposed Development	Use of diesel generators	**148.1** What capacity of generator is needed to power the site? Has noise assessment been considered in relation to generator use?	**148.1** See Submission ID 45.1 (a).
149. Shaun and Patrea Carey	Section 3.7.3	Chapter 3 Description of the Proposed Development	Supply of water for Stage 1 of project	**149.1 a)** What size road tanker will be used to transport water? How many per day? **b)** Has this additional road use been taken into consideration when assessing impacts to other non-mining road users? **c)** What will the 50kL water be used for? Is this purely dust suppression, if so given the amount of traffic anticipated on unsealed roads is this really an adequate amount of water? **d)** We also question the suitability of wasting such a precious resource especially given the water supply to properties in the surrounding district is limited and often not meeting demand during summer months. **e)** How will Andromeda ensure that water supply and pressure to existing SA Water customers will NOT be impacted? What consequences will ensue if supply is negatively affected?	**149.1** a) Refer to Submission ID 127.1. b) Impacts to non-mining related vehicles has been included in detail in chapter 8. c) This is the water requirement for Stage 1 operations. Water will be used for ablutions, offices and dust suppression. d) Binding agents and dust suppression stabilizers will be used where possible to reduce the volume and frequency of water trucks for dust suppression where possible. e) See Submission ID 6.1.
150. Shaun and Patrea Carey	Section 3.7.4	Chapter 3 Description of the Proposed Development	Closure of water pipeline at end of mining	**150.1** The applicant suggests they are open to considering landholder off takes from the water pipeline to be installed within the proposed MPL if it was requested and to be of benefit. If landholders were able to sure up their supply by tapping into the pipeline what happens to that agreement and infrastructure upon mine closure?	**150.1** Refer 45.1 (g) and (h).

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				Would it not be more economical for SA water to take over ownership of the pipeline for use by existing customers rather than be removed as suggested?	
151. Shaun and Patrea Carey	Section 3.7.5	Chapter 3 Description of the Proposed Development	Lack of visual screening	**151.1 a)** What about screening of entire site? **b)** What bunds and plantings are suggested to soften the visual amenity to the neighbouring land? **c)** Will there be planting along mine site boundary especially northern, southern and western boundaries?	**151.1.** a) Although screening vegetation around the entire site is not currently considered in the MP, the Company will consider incorporating it through the PEPR stage, with a visual bund around site. Existing screening vegetation along roadsides will remain in place. Updated mine designs including stockpile locations have been provided in Appendix D. b) To be determined in PEPR. c) To be determined in PEPR. The Company has looked into the current site layout and agree that there is the potential to provide further amenity bunding along the north-west boundary of the ML. See Appendix C for an updated site layout which takes this into consideration. At this point in time, the focus has been on reducing the footprint of the mining operation to minimise the impact on the existing farming enterprises, as has been requested repeatedly. Additional bunding, visual barriers and vegetation zones will be considered.
152. Shaun and Patrea Carey	Section 3.7.8	Chapter 3 Description of the Proposed Development	Water run-off onto lower lying area	**152.1** What strategies will be used along boundaries to ensure neighbours do not experience excessive water runoff and consequent erosion from the site?	**152.1** See Submission ID 119.1.
153. Shaun and Patrea Carey	Section 3.8.1	Chapter 3 Description of the Proposed Development	Perceived minimised disturbance to agricultural land	***153.1*** *"The proposed development has been designed in consultation with landowners and has included stipulations to minimise disturbance of, and direct impact to, agricultural land where possible"* How do you define "consultation"? What stipulations and strategies are being used to minimise impacts to agricultural land?	**153.1** During the years of exploration in the region, plans have been discussed with the landholders, in relation to the geological investigation work, primary layouts and access roads. During those times, the views of the landholders have been considered to inform subsequent designs – the approach has been iterative. The statement specifically refers to the location of the Processing Plant and Access Road. The location of the Processing Plant and MPL route for the Access Road was altered in response to landowner requests to limit the impact to agricultural land as far as feasible. As a result, the Processing Plant and Access Road have been located within native vegetation rather than cropping land for the most part, in order to balance impact on higher quality native vegetation and agricultural land. Ultimately the Proposed Development and the area it requires is based on a geological feature that is set and cannot be changed.
154. Shaun and Patrea Carey	Section 3.9.1	Chapter 3 Description of the Proposed Development	Mine site at completion	**154.1 a)** Will pit be backfilled as previously indicated? Why not? How big will remaining stockpiles be? **b)** Where and what size will bund be? **c)** Is there a clear rehabilitation plan?	**154.1** a) Refer to Submission ID 41.1 (a). As the mine progresses, overburden from progressive areas will be placed into the mined areas. For example, overburden from cutback 3 will backfill cutback 1, This will occur throughout the mine life, until the final void remains at cutback 17. b) The safety bund will have final design specifications verified through the life of mine. c) As noted in Submission ID 145.1, the detailed rehabilitation plan will be developed in the PEPR. The MP provides conceptual plans to demonstrate closure is achievable against the proposed outcomes and legislative requirements.
155. Shaun and Patrea Carey	Section 3.9.1	Chapter 3 Description of the	Post closure pit, Figure 3-27	**155.1** What is the purpose of the post closure pit as shown in figure 3-27? The location of this pit appears to be on land that we currently own. In all our "consultations" with AM we were never made aware, prior to	**155.1** a) Refer to Submission ID 154.1.

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		Proposed Development		reading the mining proposal, that there would be an open pit remaining post mine closure. Our understanding was that the mine would be backfilled and returned as close as possible to the natural landscape.	
156. Shaun and Patrea Carey	Section 5.3.1	Chapter 5 Stakeholder Consultation	Appropriate level of stakeholder engagement	**156.1** Surrounding land holders were not sent any communication about the mining proposal and submission period from Andromeda until the immediate landholders subsequently alerted them and Andromeda.	**156.1** Refer to Submission ID 4.1.
157. Shaun and Patrea Carey	Section 5.4.1	Chapter 5 Stakeholder Consultation	Drop in day attendance	**157.1** In the attendance data of drop in days, what relevance does gender have?	**157.1** There are multiple social and demographic variables, gender is one of the most common pieces of demographic data collected. In this instance it is used to guide the message format, timing, presentation, and evaluation to ensure we engage with stakeholders in a way which is accessible and understood.
158. Shaun and Patrea Carey	Section 5.5.4	Chapter 5 Stakeholder Consultation	Stakeholder benefits & issues register	**158.1** Many of the questions raised by stakeholders are not adequately addressed by the applicant in their response.	**158.1** No specific information relating to questions raised and inadequate responses has been provided by the submitter. All issues raised during community consultation that were relevant to possible impacts by the Proposed Development were addressed in the MP. Concerns were raised by some stakeholders relating to issues that were not impacted by the Proposed Development. These matters were considered in the scientific analysis and resulted in no impact.
159. Shaun and Patrea Carey	Section 5.6	Chapter 5 Stakeholder Consultation	Outcome development	**159.1** Some of the community comments do not accurately reflect the views of key stakeholders. The applicant has provided no response to many of the community comments on the outcomes developed.	**159.1** As noted in Submission ID 158.1 above, no specifics have been provided by the submitter.
160. Shaun and Patrea Carey	Section 8.3.2	Chapter 8 Traffic	Compliance in traffic control and management	**160.1** What accountability will be provided to ensure the strategies listed in table 8-1 are adhered to?	**160.1** If the ML is granted, it will be made subject to a range of conditions which the Company must comply with. This will include appropriate control and management strategies which will need to be incorporated into the PEPR. Any non-compliance may result in enforcement action by the DEM under Part 10B of the *Mining Act 1971*.
161. Shaun and Patrea Carey	Section 8.4.2	Chapter 8 Traffic	Road safety assurance with such high number of traffic predicted	**161.1 a)** Table 8-2 indicates a high number of daily traffic predicted to be using an otherwise low traffic road (Poochera-Port Kenny Road) how will safety and access be assured for other road users especially with the road remaining unsealed? **b)** With the largest traffic numbers to be in the first 18 months why has the applicant not prioritised sealing the road? **c)** Previous indications by the applicant to the landowners (us) was that majority of the work force would be bused from Streaky Bay to and from the mine site eliminating the need for so much light vehicle traffic. Is this no longer being considered? If not where on the mine site will the employees (75 people) be parking their vehicles?	**161.1** a) Refer Submission ID 1.1 and 1.2. b) Refer Submission ID 1.1 and 1.2. c) An employee transport (bus) has been proposed. There will also be a carpark onsite for both employees and visitors. See Figure 3-18. This design will become more definitive as the Proposed Development moves into final design for construction.
162. Shaun and Patrea Carey	Section 8.4.2	Chapter 8 Traffic	Heavy Vehicle movements and local school bus route	**162.1** How accountable will the applicant be to continue to uphold their commitment to avoid haulage traffic at the same time as our local school bus service travels along Poochera-Port Kenny Road?	**162.1** Refer to Submission ID 1.2. Andromeda recognises that this is an important issue and are committed to not running haulage trucks during the school bus transit times along the Poochera-Port Kenny Road. The Company will have internal procedures developed to prevent haulage trucks from operating during the school bus transit times. A complaints hotline, community engagement register, community issues register and a complaints register will be established to collect information and investigate any

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					complaint. Complaints must be reported within the ML's public annual compliance reporting to the DEM. The DEM are able to enforce Companies to comply with commitments which form part of their licence conditions. These reports are also released publicly.
163. Shaun and Patrea Carey	Section 8.4.2	Chapter 8 Traffic	Frequency of heavy vehicle movements especially on the unsealed Poochera-Port Kenny Road	**163.1 a)** The applicant states "a minor increase in truck frequencies may be experienced on lower volume roadways (Poochera- Port Kenny Road) where estimated frequency is one HV every 10 minutes." We travel on the Poochera- Pt Kenny road at least twice a week at various daylight hours, very rarely encountering any other traffic travelling in either direction. How can 1 heavy vehicle every 10 minutes during daytime be considered a "minor increase" in traffic? **b)** The proposed development is estimated to increase total of HV by less than 1%, given the applicant does not know which Port (Thevenard, Whyalla or Lucky Bay) it will be trucking to, how was this figure calculated? **c)** The calculation of increased total of HV by less than 1% is grossly inadequate in relation to the planned traffic Poochera-Port Kenny Road. This road is not designed to sustain such an amount of daily traffic.	**163.1** a) The data suggests that the biggest impact will be on Poochera-Port Kenny Road where heavy vehicle daily traffic will increase by 90% in Operation Stage 1 and 79% in Operation Stage 2 compared to existing 2019 traffic volumes. b) Traffic increase were calculated for all three routes, and this figure (1%) is correct for all three routes – between 0.61% and 0.98% increase overall for Stage 1 operations, and between 0.27% and 0.43% increase overall for Stage 2 operations. c) Poochera-Port Kenny Road is currently a Road Train Commodity Route and currently allowed for lower volume, seasonal access (e.g. during harvest) for 36.2 m A-Doubles and AB-Triples road trains. Independent traffic consultants Tonkin have assessed the capacity of the Poochera-Port Kenny Road. With the upgrades and ongoing maintenance as proposed by the Company, the risk associated with the increase in traffic would be considered acceptable (Tonkin).
164. Shaun and Patrea Carey	Section 9.5	Chapter 9 Flora, Fauna and Native Vegetation	Outcomes and measurement criteria – adverse impacts to agricultural productivity for third party land users	**164.1** The draft outcome measurement criteria states "annual dust deposition on a representative number of adjoining properties does not exceed 4g/m2/month and no more than 2g/m2/month above background." **a)** ~ What is this figure based on? **b)** ~ What is the current environmental standard? **c)** ~ What is the baseline figure for the site pre –mine? **d)** ~ What measures are in place if these figures are exceeded? **e)** As an adjoining landholder who will be immediately impacted by any increasing in dust, especially being the neighbour on the southern boundary to the site, we are very concerned about the lack of detail in the applicant's commitment to dust mitigation. We are concerned about the negative impacts dust may have on our grazing stock and cropping program, which is immeasurable until we actually experience farming next to a mine.	**164.1** a – c) Refer to Submission ID 77.1. d) Refer to Submission ID 64.1. e) Refer to Appendix B.
165. Shaun and Patrea Carey	Section 12.3.1	Chapter 12 Air Quality	Lack of design measures to minimise impacts to air quality	**165.1 a)** Will there be dust monitors at sensitive receptors? **b)** Does the applicant intend to use stabilised stockpiles to buffer impacts to sensitive receptors (dust, noise & light spill)? **c)** What considerations being made for high wind days, as wind speeds are not constant for 365 days a year?	**165.1** a) Refer to Submission ID 7.1. b) Refer to Submission ID 85.1. c) Refer to Submission ID 86.1.
166. Shaun and Patrea Carey	Section 12.4.1	Chapter 12 Air Quality	Inconsistencies in information provided under emissions sources and characteristics of the proposed development (Table 12-4)	**166.1 a)** Under operating hours product dispatch is listed as "24 hour, 7 days" however page 262 states heavy vehicle frequency in a 12 hour period, indicating haulage of materials will only occur during 12 hour day shift. Will heavy vehicle traffic to port be 12 hours or 24 hours? If it is 24 hours why has that not been clearly stated anywhere? Has it been	**166.1** a) Haulage during Stage 1 will be limited to dayshift. Haulage during Stage 2 will be on a 24 hour basis. Haulage was included in all noise modelling scenarios. b) Refer Submission ID 33.1.

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				considered in relation to impacts to sensitive receptors (i.e. noise and dust)? **b)** It is indicated blasting frequency "Quarterly if required." Yet under 3.4-6 use of explosives (pg142) the applicant states that blasting is "expected to occur no more than monthly." Which is it monthly or quarterly? Why does the assessment of maximum 24 hour impacts assume blasting is every day of the year?	
167. Shaun and Patrea Carey	Section 12.4.1	Chapter 12 Air Quality	Mobile crushing plant	**167.1** Has this been considered in noise assessment?	**167.1** No. Inclusion of a mobile crusher with a sound power level of up to 120 dB(A) near the ROM pad would not increase the predicted noise levels at the most affected noise sensitive receivers. Note predicted noise levels at the nearest receiver R1 are dominated by noise emissions from plant operating in the cutback for year 1, which represents worst-case noise emissions.
168. Shaun and Patrea Carey	Section 12.4.4	Chapter 12 Air Quality	Residential receptors	**168.1** Why have residential receptors not been organised in order of distance from development?	**168.1** There is no reason behind the ordering of the receptors.
169. Shaun and Patrea Carey	Section 12.4.4	Chapter 12 Air Quality	Inaccuracy of figure 12-2 – commercial receptors	**169.1** This figure fails to recognise that the majority of landholders surrounding the development run stock and therefore utilise their scrub and vegetated areas for grazing.	**169.1** This data was taken from the Australian Land Use and Management, as provided by the Department for Environment and Water. This dataset depicts land use across South Australia according to the Australian Land Use and Management (ALUM) Classification Version 8. It forms part of the Australian Collaborative Land Use and Management Program (ACLUMP) land use mapping. The dataset is a combination of land use data mapped over recent years. The data were derived from an initial desktop interpretation of aerial imagery followed by an on-ground field survey. The data can be accessed at: http://location.sa.gov.au/lms/Reports/ReportMetadata.aspx?p_no=2072+&pa=dewnr.
170. Shaun and Patrea Carey	Section 12.4.7	Chapter 12 Air Quality	Overview of potential impact	**170.1 a)**Is the generalization of impacts as "minimal" "low" and "minor" accurately depicting the situation for R1 considering that is only 800m from the site which is three times closer than R2? It our view that the location of R1 in such close proximity severely increases the impact to them compared to all of the other residential receptors, therefore the impacts to R1 need far more specific in their representation. **b)** The proposal states "*The consequence of change is considered to be minor, as there could be a local short term and minor surpasses of air quality standards and is expected to remain as low impact.*" How can dust generation from mine operations and processing 24hrs a day, 7 days a week for 26 years be considered short term and low impact?	**170.1** a) Refer to Submissions ID 97.1 and ID 99.1. b) predictive air quality modelling does not expect there to be exceedances to the proposed air quality criteria. To be conservative, The Company has assumed that there is the potential for local short term and minor surpasses of air quality standards (criteria). This is not ongoing, long-term exceedances.
171. Shaun and Patrea Carey	Section 12.4.10	Chapter 12 Air Quality	Impacts and Risks	**171.1** How can a value that is only just compliant be given a minimum level impact and be low level risk? A risk assessment is supposed to be based on a worst case scenario, which is R1.	**171.1** Refer to Submission ID 97.1 and 99.1.
172. Shaun and Patrea Carey	Section 12.4.11	Chapter 12 Air Quality	Improper justification of impacts and risks to residences	**172.1** The applicant states no further controls are necessary, yet what controls have been presented other than water trucks? The applicant has not genuinely committed to providing relief for the residence at R1. Why have alternative buffering methods not been considered?	**172.1** Refer to Submission ID 101.1.

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173. Shaun and Patrea Carey	Section 12.5	Chapter 12 Air Quality	Proposed measurement criteria of draft outcomes (Table 12-17)	**173.1 a)** What are 4g and 2g values based on? **b)** Why has the applicant not considered that 24hr PM10 particulate concentrations should be based on R1 as the closest receptor, if R1 is compliant then all other receptors will be?	**173.1** a) Refer to Submission ID 77.1. b) Refer to Submission ID 104.1.
174. Shaun and Patrea Carey	Section 12.6	Chapter 12 Air Quality	Lack of impact reduction to closest receptors	**174.1** Yes "only" two of the ten receptors are within 3kms of the site but what is the applicant doing to reduce the impacts to those two closest receptors?	**174.1** Please refer to control measures outlined in Submission ID 101.1.
175. Shaun and Patrea Carey	Section 13.3.2	Chapter 13 Noise and Vibration	Noise	**175.1** Does the applicant have noise management procedures? How will they ensure compliance?	**175.1** Section 13.3. of the MP identifies design measures, management and control strategies which will be implemented to mitigate the level of impact and risk associated with noise and vibration such that it is considered to be as low as reasonably practicable. The impact and risk assessment, predicted noise levels their management and monitoring are contained in Sections 13.3, 13.4 and 13.5 of the MP. The proposed management and control strategies will be implemented in accordance with the Environment Protection (Noise) Policy 2007.
176. Shaun and Patrea Carey	Section 13.4	Chapter 13 Noise and Vibration	Noise impacts	**176.1** The existing environment is "Quiet", how does this quantify to the figures in table 13.6 (pg 351)? How many decibels is "Quiet"?	**176.1** Baseline noise measurements have been undertaken since the submission of the MP and are included in Appendix E.
177. Shaun and Patrea Carey	Section 13.4.1	Chapter 13 Noise and Vibration	Predicted construction noise and impacts	**177.1 a)** What noise will be generated by; ~ Mobile crusher for road construction? ~ Drilling and Blasting? **b)** What accountability is there if the construction activities exceed noise limits?	**177.1** a) Refer to Submission ID 167.1 in regards to the mobile crusher. Blasting overpressure (noise) is addressed in Section 7.5.2 of MP Appendix L. The overpressure depends on the charge weight. The charge weight will be limited to ensure that the ground vibration and air overpressure criteria in AS 2187.2 are achieved at the nearest residence. Further context: Air-overpressure (noise) for drilling and blasting - Noise from blasting is instantaneous, and measured in dB(linear). Criteria for blasting is adopted from AS2187.2.2006 Use of explosives and states all blasts must be less than 115 dBL at the nearest sensitive receptor for 95% of blasts per year, with a maximum of 120 dBL or higher limit as agreed with individual sensitive receptors. Based on this, preliminary maximum charge weights have been calculated to comply with AS2187.2.2006. b) Refer to Submission ID 64.1. Additionally, there are provisions for addressing non-compliant activities under the Environment Protection Act 1991 (SA).
178. Shaun and Patrea Carey	Section 13.4.2	Chapter 13 Noise and Vibration	Operations noise levels	**178.1 a)** Does modeling take into account that the ROM will be elevated 4m above ground? **b)** What noise buffering strategies will be used? **c)** Can not exceeding be considered "minor impact" especially to R1?	**178.1** a) See Submission ID 21.1. b) Control measures used to mititgate noise are included in MP Chapter 13, section 3. c) The EPA have since provided further comment. See Government submission ID 43 and 44.
179. Shaun and Patrea Carey	Section 13.6	Chapter 13 Noise and Vibration	Noise findings and conclusion	**179.1 a)** How is noise exceedance acceptable just because there is only one receptor within a km? **b)** Is there a noise management plan and procedure?	**179.1** a) The noise assessment is based on worst-case assumptions including: • all equipment operating simultaneously; • mobile plant located in the cutback for year 1, which is closest to this receptor;

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					• worst-case meteorological conditions; • no noise attenuation from stockpiles, overburden or equipment operating below existing surface level The worst-case predicted noise levels indicate exceedance of the relevant night time criteria for one hour between 6am and 7am at this receptor. It is expected that conditions resulting in potential exceedance at this location will be rare in practice and unlikely to be sustained as the operation progressively moves away from the Year 1 cutback. Additionally, see Government submission ID 43 and 44. b) Refer to submission ID 113.1 b)
180. Shaun and Patrea Carey	Section 14.1	Chapter 14 Soil and Land Quality	Inaccurate statement	**180.1** The applicant states "NO" concerns regarding soil and land quality were raised during stakeholder engagement. We as immediate landholders have raised concerns about dust, erosion and contamination.	Matters associated with 'dust' and impact on agricultural productivity, erosion, native vegetation, and soil contamination have been captured in the following chapters and impact events; Chapter 9 - Flora, Fauna, Pests and Native Vegetation (NV_02; NV_03, NV_05) Chapter 12 – Air Quality (refer AQ-01, AQ-02, AQ-05, Aq-06 and AQ-07) Chapter 14 – Soil & Land Quality (SLQ_01, SLQ_04) As per the statement on pg. 224, the broader community (stakeholders) have not raised any concern about arable land, soil or land quality during any stakeholder engagement activity. However, The Company is addressing these matters with individual landowners and has captured the potential impact as outlined above and has documented appropriate outcomes and measurements.
181. Shaun and Patrea Carey	Section 14.4	Chapter 14 Soil and Land Quality	Strategies to mitigate soil degradation	**181.1** Will the applicant conduct regular soil testing in, around and adjacent to site to ensure no deterioration of soil quality occurs in neighbouring land?	**181.1** Refer submission ID 115.1.
182. Shaun and Patrea Carey	Section 15.2	Chapter 15 Visual Amenity	Accuracy of viewpoints	**182.1** None of the images recognise the elevation of R5 and R6 and the south easterly direction these receptors face, given these factors both receptors will have visibility of certain aspects of the mine from the homes.	**182.1** R5 and R6 are located approximately 3.7 km from the mining operation and are situated at approximately 130 m AHD. Between R5/R6 Is topography to the south-east which has a higher topography of 140 to 150 m AHD. This, in addition to the site bunding and stockpiles, will block the direct line of site to the pit and the processing plant. The stockpiles and bunds will be rehabilitated with vegetation as soon as practical and at a distance of ~3 km, will blend into the existing landscape once vegetative cover is established.
183. Shaun and Patrea Carey	Section 15.3.1	Chapter 15 Visual Amenity	Control measures to visual amenity	**183.1 a)** Where will screening bunds be located? What will be used to construct them? How big will they be and how much will they screen of the site? **b)** Where are the permanent stockpiles located? How will they be vegetated?	**183.1** a) The Company has looked into the current site layout and agree that there is the potential to provide further amenity bunding along the north-west boundary of the ML. See Appendix C for an updated site layout which takes this into consideration. At this point in time, the focus has been on reducing the footprint of the mining operation to minimise the impact on the existing farming enterprises, as has been requested repeatedly. Additional bunding, visual barriers and vegetation zones will be considered. Any amenity bunds would be constructed from topsoil, subsoil or overburden. b) Refer to Appendix D. Permanent bunds include the overburden stockpile.

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					Stockpiles will be hydroseeded with either native grasses or a variety of sterile pasture grasses. This detail is to be determined and presented in the PEPR.
184. Shaun and Patrea Carey	Section 15.4.2	Chapter 15 Visual Amenity	Visual amenity to community as result of the development	**184.1** The applicant states visual amenity within a 3km radius will be impacted. This statement fails to recognise that although we (R5 and R6) are 3.5km away from the development due to our elevation and orientation we will have a greater visual impact from our home than R2 at 2.8km away.	**184.1** See Submission ID 182.1.
185. Shaun and Patrea Carey	Section 15.4.3 t	Chapter 15 Visual Amenity	Visual amenity for local residents	**185.1** As stated above due to the elevation of our home and south eastern orientation some aspects of the development will be in our line of sight. It is stated the maximum height will be 10 metres yet it was previously stated that overburden will be up to 18 metres high. Viewpoint 4 (plate 15-4) is depicted as representing our receptors. However this photograph is taken from the road side and does not consider that our home is 200metres from the road and at higher elevation (approx 131m) therefore not accurate depiction of the viewpoint. Being largely blocked by topography and vegetation does not mean we will not be impacted visually by the development.	**185.1** Typing error. Should be 18 m (overburden stockpile).
District Council of Streaky Bay					
186. DCSB	Chapter 5	Chapter 5 Stakeholder Consultation	Stakeholder Engagement	**186.1** Council requests, the Inkster Community have the opportunity to engage with Andromeda Metals prior to the granting of the Mining Lease or Miscellaneous Purposes Licenses in order for them to fully understand the project and its impacts on their community.	**186.1** Refer to Submission ID 4.1.
187. DCSB	Chapter 13	Chapter 13 Noise and Vibration	Noise and Vibration	**187.1** The house will be within 800m of the mine boundary when at its closest operating site. Concern therefore surrounds the impact explosives use will have on both the structure of the Careys home and the noise pollution it will cause. Council requests monitoring of noise levels to ensure noise is never louder than required decibel limits, including during blasting. Council also therefore request that explosive use be restricted times to be negotiated directly with the Careys. **187.2** Council can find no evidence in the documents provided specifying how noise management will be achieved. **187.3** Council request some consideration to the possible damage that may occur to the Carey farm houses as a direct result of blasting so near their properties (800m and 2.8km respectively).	**187.1 Use of Explosives** The Company will be managed in accordance with and comply with the Australian blasting compliance limits AS 2187.2 – 2006. The objective of this Standard is to provide requirements, information, and guidance for the use of explosives, the management of a site where explosives are used and the destruction of excess or deteriorated explosives, which ensure risks are acceptable minimized. This includes standard industry management strategies to ensure acceptable vibration and air overpressure limits are achievable, based on distance to receptor, rock type and type of explosive. Blasting will be undertaken as required and is expected to occur no more than monthly, although more likely on a quarterly basis and between 7am and 7pm weekdays. This is open to be negotiated with the identified landholder through the development of the PEPR and in regard to a Communications Protocol. Monitoring framework for explosive use has yet to be confirmed, however, could include the use of geophones at prescribed locations within the ML, which monitor both ground vibration and air overpressure. **187.2 Noise management** The Company will be regulated under Construction activities are regulated under Part 6, Division 1—Construction noise of the Environment Protection (Noise) Policy 2007 (Noise EPP). Section 13.3. of the MP identifies design measures, management and control strategies which will be implemented to mitigate the level of impact and risk associated with noise and vibration such that it is considered to be as low as reasonably practicable. The Project specific impact and risk assessment, predicted noise levels their management and monitoring are contained in Sections 13.3, 13.4 and 13.5 of the MP.

<table>
<tr><th>Item #</th><th>MP Section #</th><th>Chapter Name</th><th>Issue</th><th>Concerns/ Questions / Benefits/ Further Information Requested</th><th>The Company's Response</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>187.3 <u>Use of explosives and buildings</u>
The effects of ground vibration are separated into two categories:
Human response - Vibration that inconveniences or possibly disturbs the occupants or users of a building.
Structural damage - Vibration that impacts on the structural integrity of a building, such as causes cracks in plaster walls and masonry.
The vibration criteria for human response are more stringent than the vibration criteria for structural damage for buildings. Cosmetic or structural damage to buildings would only occur due to extreme vibration levels relative to what humans would find tolerable or uncomfortable. The vibration criteria for human comfort rather than structural damage which has been adopted for this project.</td></tr>
<tr><td>188. DCSB</td><td>Chapter 12</td><td>Chapter 12 Air Quality</td><td>Air Quality</td><td>188.1 The dust produced from a working mine such as this however will be considerably, and consistently, more than is currently experienced. Council therefore feels air quality testing of both Carey properties will be imperative to ensure the dust they are experiencing neither contains harmful substances, nor exceeds the recommended 100ppm environmental safety standards.
To adequately suppress the dust that will be caused by the number of Type

188.2 Vehicles expected on this road, Andromeda Metals will more than likely be required to apply water to the road surface after almost every truck movement (1 truck every 10 minutes). Council cannot support the waste of such a precious resource in this way and has grave concerns regards safety of the vehicles. Council therefore requests Andromeda Metals conduct air quality testing and provide monthly reports to the community and land holders adjacent to the Poochera Port Kenny Road for the entire period the road remains unsealed. There should also be a guarantee that should dust levels exceed the 100ppm at any time of operation, the road will be sealed immediately as a priority and in consultation with those affected by this work.</td><td>188.1<u>Air quality monitoring</u>
The Company has currently installed a live air quality monitor on the Carey's property and are committed to installing a range of air quality monitors on a representative number of adjoining properties, as well as within the ML. The locations are to be confirmed through PEPR development on advice from air quality monitoring specialists.

Criteria – replicated from Section 12.4.2 of the MP
South Australian EPA air quality guidelines are published in the Environment Protection (Air Quality) Policy 2016 (AQEPP) under Section 28 of the Environment Protection Act 1993.

Table 12-5 AQ EPP ground level concentrations<table><tr><th>Pollutant</th><th>Classification</th><th>Averaging time</th><th>Maximum concentration ($mg \cdot m^{-3}$)</th><th>Maximum concentration (ppm)</th></tr><tr><td>Nitrogen dioxide (NO_2)</td><td>Toxicity</td><td>1 hour</td><td>0.25</td><td>0.12</td></tr><tr><td></td><td></td><td>12 months</td><td>0.06</td><td>0.03</td></tr><tr><td>Particles (as PM_{10})</td><td>Toxicity; Group 1 carcinogen</td><td>24 hours</td><td>0.05</td><td>-</td></tr><tr><td>Particles (as $PM_{2.5}$)</td><td>Toxicity; Group 1 carcinogen</td><td>24 hours</td><td>0.025</td><td>-</td></tr><tr><td></td><td></td><td>12 months</td><td>0.008</td><td>-</td></tr><tr><td>Respirable crystalline silica (RCS)</td><td>Toxicity; Group 1 carcinogen (IARC)</td><td>3 minutes</td><td>0.00036</td><td>-</td></tr></table>The assessment criteria outlined above do not include criteria for total suspended particulate (TSP) nor dust deposition rates. Both of these values are important for the demonstration of control of nuisance dust impacts, which may be experienced as visible dust plumes or dust soiling impacts, such as deposition on surfaces such as washing, windowsills, car bonnets etc. In lieu of published State-specific criteria, reference is made to inter-state standards.
Air quality guidelines adopted by the NSW Environment Protection Authority (EPA) are published in the 'Approved Methods for the Modelling and Assessment of Air Quality in NSW' (NSW EPA 2017) (the Approved Methods). The Approved Methods include annual average TSP and dust deposition criteria which have been adopted to assess the potential for nuisance dust impacts associated with the Proposed Development, and are presented in Table 12-6.</td></tr>
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Item #	MP Section #	Chapter Name	Issue	Concerns/ Questions / Benefits/ Further Information Requested	The Company's Response
					Table 12-6 NSW EPA air quality standards and goals Pollutant | Averaging period | Units[a] | Criterion | Notes Particulates (as total suspended particulate [TSP]) | 1 year | µg·m^{-3} | 90 | Deposited dust | 1 year | g m^{-2}·month^{-1}[b] | 2 | Assessed as insoluble solids as defined by AS 3580.10.1 g m^{-2}·month^{-1}[c] | 4 **Notes:** (a): micrograms per cubic metre of air (b): Maximum increase in deposited dust level (c): Maximum total deposited dust level **188.2 Sealing of Poochera-Port Kenny Road** Refer to Submission ID 1.2.
189. DCSB	Chapter 8	Chapter 8 Traffic	Traffic and Transport	**189.1** Andromeda's own figures would suggest one truck movement every ten minutes during daylight hours (with restrictions in place during school bus times). Very real concerns therefore exist surrounding road safety and the ability of roads to support this type of usage. **189.2** Council does not believe haul to Lucky Bay or Whyalla is possible as it will require much further distances and with the number of truck movements indicated, significant risk to road users utilising the same routes. The widening of the Eyre Highway to Port Augusta will not allow for the number of trucks, that will be moving at no more than 80kms per hour, to be overtaken by faster moving traffic in a safe manner. Council would strongly suggest Lucky Bay and Whyalla are not practical, particularly during harvest when both ports are already at capacity receiving grain. Increasing traffic in those areas will only serve to increase the problems sometime experienced with wait times and scheduling. **189.3** Andromeda Metals have said that they will not allow movements of trucks during school bus hours and Council sincerely hope that this will be the case, however remain concerned it will become impractical due to the number of movements required to meet production requirements. Council are not clear as to any strategies for ensuring this requirement is met and remains in place for the life of the mine. **189.4** The Inkster farmers are very concerned regarding how the interaction between their wide and oversized vehicles and the Type 2 Heavy Vehicles will be managed. Neither vehicle will be significantly able to "give way" to the other and it is envisaged this will disrupt both farming and mining operations if not addressed prior to mine construction and commencement.	**189.1 Truck movements and safety** The Company acknowledge that traffic volumes on the Poochera-Port Kenny Road are currently low outside of seeding and harvest periods. One HV every 10 minutes was calculated to be: – 24 loads of ore per day and 4 deliveries, equating to 56 heavy vehicles entering and leaving the ML per day. On a 7am – 7pm, schedule (12 hours), removing 2 hours (8-9am, and 3-4pm) for school buses to access the site, that leaves 10 hours in the day in which to load ore and receive deliveries. 56 movements, averaged over 10 hours, results in 5.6 HV movements per hour. Traffic counts were available for the Poochera-Port Kenny Road from 21 August to 28 November 2019 and indicated some 3,196 vehicles were counted over this period, of which 17.8 (or 569 vehicles) were heavy vehicles. This equates to an average of 35 vehicles per day, acknowledging that this time period does not cover harvest or seeding. The 1% increase is an increase calculated over the entirety of the proposed haulage routes, that is, from mine gate to a port at either Thevenard, Lucky Bay or Whyalla. **189.2 Haulage to ports** The Company will continue to work with all relevant councils along the ultimate proposed haulage route, as well as the Department for Infrastructure and Transport and the port operator to ensure all roads are operated safely and within the nominated capacity of the road. At present, there are over 200-300 heavy vehicles traversing along the Eyre Highway, 130-400 heavy vehicles travelling along sections of the Lincoln Highway, and 130 heavy vehicles travelling through Cleve. The Company does not consider an additional 24 loads over the first 18 months (stage 1) and then 10 loads from then onwards (stage 2) of ore is a material difference along these routes. **189.3 School bus exemption** Refer to Submission ID 1.2. **189.4 Farmer oversize machinery transport / harvest HV traffic** Like all road users, all traffic associated with the Proposed Development must comply with the law to ensure safe operation of vehicles and equipment. This includes any interactions with slow moving vehicles, local farm traffic and oversized machinery, harvest heavy vehicles.

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					The council road has been assessed in relation to relevant unsealed road design criteria (ARRB Unsealed Roads Manual – Guidelines to Good Practice (2009); Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections). The road currently does not meet the required design specifications for road curvature or crest angle. A redesign has been undertaken by Tonkin Consulting to realign the vertical and horizontal alignment to meet the requisite standards. This work is being reviewed by the DCSB and provides for a substantial increase in the safety standard of the road. See Submission ID 1.3 for further comment on road safety and farming interactions.
190. DCSB	Sections 3.7.3, 3.7.4 and Chapter 17	Chapter 3 Description of the Proposed Development, Chapter 17	Water supply and pressure	**190.1** Those SA Water Customers serviced by the Streaky Bay line in the Poochera area have noticed significant reduction in access to that water as Streak Bay has grown. Concerns are raised that the increase of requirement from the Todd Line (through the duplication of the line to the mine site) will further reduce the pressure for customers already having issues with service.	**190.1 <u>SA Water mains supply</u>** Water supply information and potential for impact was included in Sections 3.7.3, 3.7.4, and Chapter 17. Both the Company and SA Water have a commitment to ensure water supply and pressure in the region to all existing users. The Company would become a customer of SA Water, as all other residents and business owners in the region. To date, SA Water has indicated that water supply for the mine is able to meet mine demand, and not impact existing users supply or water pressure. SA Water has responded to questions raised regarding water supply and reliability, this has been included in Appendix A. The Company will source water for the Project from the trunk main at Poochera by duplicating the existing infrastructure along Streaky Bay Road. The Company will pay for the existing supply line to be supplemented with a parallel pipe (larger in diameter than the existing infrastructure) to the Poochera-Port Kenny Road offtake. Water supply for the Project will be taken at this point while still providing additional volume available for Streaky Bay and the existing Inkster water users. A dedicated water pipeline has been designed for the Project and will connect to the duplicate pipe and will be installed in the Poochera-Port Kenny Road reserve, from Streaky Bay Road to site.
191. Jason McEvoy				**191.1** Benefits to region. Employment opportunities.	Noted
192. Ken Dickson				**192.1** Good community engagement throughout the process. Informative and well researched ML-MP. Practical and adequate mitigation strategies.	Noted
193. Trevor Gilmore				**193.1** Local employment opportunities. A future tourist attraction. Possibility of value addition to the raw product on site.	Noted
194. Donald and Ingrid Stewart				**194.1** Informative and engaging stakeholder information sessions. Increased local employment opportunities. Boosting local businesses.	Noted
195. Alan Lange				**195.1** Employment opportunities and economic growth for the Streaky Bay township. Infrastructural development within the community.	Noted
196. Stuart McCall and Lisa Hong				**196.1** Increased trade for local businesses. Increased local job opportunities. Infrastructure and population growth.	Noted

Item #	MP Section #	Chapter Name	Issue	Concerns/ Questions / Benefits/ Further Information Requested	The Company's Response
197. Kane McEvoy				**197.1** Increased local employment Investment and economic growth in and for local businesses. Investment in local infrastructure	Noted
198. Tony Griffin				**198.1** The development is essential in maintaining and developing infrastructure and facilities such as hospitals and general service facilities. Strengthen local businesses	Noted
199. Greg Walters				**199.1** Local Employment opportunities. South Australian Economic growth. Economic growth of local and regional businesses	Noted
200. Clint McEvoy				**200.1** Noting potential benefits to region. Support for project. **200.2** Maintenance of continuity of water supply to existing users including stock water. **200.3** Capacity of local road network to cope with additional road use due to mine traffic. **200.4** Impacts to nearby residences from mine operations	**200.1** Noted **200.2** See submission ID 6.1. **200.3** See submission ID 1. **200.4** See submission ID 97.1.

During the statutory circulation period the applications were circulated to SA government departments deemed relevant to the proposal based on the information provided. A list of the matters raised by SA Government departments (including comments from DEM) during the statutory consultation period is presented below.

Table 3-3 Matters raised by the Department for Energy and Mining

#	Reference	Description of Matter Raised by SA Government	Further Information or Clarification Required	The Company's Response
1	Section 3.1 General description page 104 and Section 3.6.1 Waste rock and tailings storage facilities	Tailings and waste rock. TOR006 - clause 2.6.1 DEM notes the proposal states that after processing, tailings will be placed back into the mine void after mining. No information is provided on potential environmental impacts associated with the placement of tails into the mine void. Consideration should be given to: • geochemistry of tailings and potential interactions with the environment after mine closure. • effect on ground water flows by placing a porous medium back where an aquitard was.	Provide all relevant information to satisfy TOR006 – clause 2.6.1	Composition of returned sand below. Predominately quartz. Fe2O3 % 0.1; SiO2 % 88.0; Al2O3 % 4.8; CaO % 0.0; K2O % 2.9; Mn % 0.0; Na2O % 0.3; MgO % 0.0; P % 0.0; S % 0.0; TiO2 % 0.2; Cl % 0.0; LOI % 0.6; Other % 3.1 Impact of sand back into pit was addressed in 11.3.3. *"Sand may be returned to the open pit following separation from ore during processing activities. The sand moisture content (8-10%) is expected to be less than the ore moisture content (around 20%) and therefore will not cause an increase in the groundwater table."* Backfill modelling will be carried out on final pit design for PEPR Rainfall inflow from will suppress water from PDG aquifer rising into Garford with the modelling to confirm this, and outlined in an updated consolidated groundwater report will be presented for the PEPR.
2	Figure 3-1 Site layout of the proposed development (ML and access road MPL) page 107, Figure 3-7 Stages of mining in open pits and indicative pit design page 134.	*"The background image in Figure 3-3 is colour stretched to identify zones of halloysite +5% (teal) and ISO B +84% (red) and demonstrates the heterogeneity of the deposit."* From page 113 DEM notes the proposed disturbance footprint for the mine and processing area are tightly constrained, minimising disturbance to agricultural production and minimising clearance of native vegetation. Resource model information (proposal Sec 3.2) suggests the kaolin grade (quality, form and quantity) is variable throughout the orebody. Variability of kaolin grade within the orebody may require additional ROM stockpiles at the processing plant to support blending to achieve product specifications.	• Provide information on the likelihood that the proposed disturbance footprint for the mine will remain as proposed. • Provide supporting information on how product specification will be maintained throughout the mining sequence • Will more than one active mining area be required to blend ore sources to meet specification.	The proposed disturbance footprint will continue to be optimised and refined through the PEPR process and throughout the mine's life. Product specifications will drive the precise location of ore to be extracted and the final mine schedule. Product specification will be maintained by blending from stockpiles of varying brightness, halloysite and Iron content. These product specifications may change throughout the mine's life driven by market requirements. More than one active mining area may be required, and further detail will be outline in the PEPR, and as dictated by market requirements.
3	Table 3-3 Great White Kaolin Mineral Resource minus 45µm, page 113	Mass balance – Table 3-3 There appears to be an 8% discrepancy in the mass balance presented.	Review Table 3-3 "Mineral Resource minus 45µm" for mass balance. Provide information on the approximately 8% of the mass that is not Kaolinite or Halloysite	The remaining 8% is largely made up of microcline and quartz with minor amounts of mica, iron oxides and ilmenite.

#	Reference	Description of Matter Raised by SA Government	Further Information or Clarification Required	The Company's Response
4	3.4.6 Use of explosives, page 141	Uncertainty associated with thickness of calcrete capping. Proposal does not describe potential for calcrete cap thickness to vary across the orebody. Variability of calcrete cap thickness may influence strategies required to remove the cap overlying the orebody and resultant impacts to sensitive receivers due to blasting. Section 3.1.1 proposes blasting will be required no more than once a month. The Resonate preliminary blasting vibration assessment states blast modelling was undertaken using data from blasting activities undertaken in similar geological conditions, not known data from the site.	Given uncertainty associated with information on calcrete cap thickness and blasting modelling assumptions, provide an assessment of confidence associated with vibration and airblast modelling for this site.	The blasting vibration assessment described in Section 7.5.1 of MP Appendix L is intended to be preliminary and is based on conservative assumptions in relation to ground conditions and vibration propagation. It is expected that the blasting contractor will undertake a detailed assessment based on actual conditions in accordance with AS 2187.2. It is expected that the actual charge weight per delay required to fracture the calcrete is likely to be significantly less than the maximum of 380 kg which is conservatively predicted to result in vibration levels of 5 mm/s at 800m.
5	3.4.6 Use of explosives, page 142	Editing Distances of dwelling houses and street, road or thoroughfares may have been transposed.	Review safety distances per SA Explosive Regulations 2011	Distances reviewed and updated: Safety distances based on the South Australian *Explosive Regulations 2011* for the explosive magazines are as follows for a protected work (including a public street, road or thoroughfare): • 237 m for the 10 t bulk explosives magazines. • 11 m for the detonator magazine. • 47 m for the packaged explosives magazine (mounded). Public safety distances for protected work (including houses): • 470 m for the bulk explosives magazines. • 22 m for the detonator magazine. • 95 m for the packaged explosives magazines. Safety distances for magazines are as follows: • 52 m mounded away from other magazines for the bulk explosives magazines. • 10 m away from other magazines for the detonator magazine. • 20 m mounded away from other magazines for the packaged explosive magazines.
6	3.9.1 Description of mine site at completion Figure 3-27 Representation of area on completion of closure activities, page 179	TOR006 – clauses 2.4.9 and 2.4.9.1 MG2a Guidelines state: 'If a pit lake is likely to occur, identify any potential end uses for it. Based on the proposed end land use, identify what investigations are required to further understand the processes that will occur during development of the pit lake and once it achieves steady state. Consider and provide evidence of, for example but not limited to: • the final shape of the pit • the final water level of the pit lake and length of time to achieve this water level • water level fluctuations and likely water quality over the period of time it takes for the pit lake to develop and achieve a steady state	Provide an assessment as to the likelihood that a pit lake may occur after mining. Consider strategies for eliminating the final pit void. i.e. starter WRD adjacent the final pit void.	The base case considered by the Company includes the potential for there to be a void remaining at the end of mining – as shown in the MP section 3.9, Figure 3-27 and 3-28, and updated in Appendix D. An updated groundwater model with the final closure scenario will be presented. This may include a mine pit lake if the void remaining is below the groundwater level. A pit lake may occur in this scenario, and this will be determined and refined in the PEPR on the updated mine schedule and plan (completed as part of the DFS). Further, as part of the DFS currently underway, options for making the overburden landform are being considered with the potential to fully filling the voids. Consideration will be made to backfill the entire pit, however, as discussed, this will be understood and presented in more detail as part of the DFS and subsequent PEPR.

#	Reference	Description of Matter Raised by SA Government	Further Information or Clarification Required	The Company's Response
		• potential impact of wave action on the pit walls' long-term stability • potential changes to groundwater • potential impact to public health and safety.'		
7	3.10.2 Energy sources, page 181	TOR006 – clause 2.10.2 'estimates of total annual energy usage (from all sources, including personnel transport and ore transport to point of sale)'	• Provide estimates on the amount of gas required to dry the noodles, • How much gas is used to generate electricity? Noting 70 GJ per hour required for electricity generation equates to a lot more than 2.5MW of power generation.	LPG usage • 13 tonnes per day drying – i.e. to dry kaolin noodles • 7 tonnes per day to generate electricity • 20 tonnes per day covers both power generation and drying. • The DFS currently identifies 42 GJ per hour is required, not 70 GJ per hour as stated in the MP.
8	3.10.2 Energy sources, Table 3-20 Energy usage and associated GHG emissions (annual), page 181	TOR006 – clause 2.10.2 'equivalent annual CO2 generated'	Review table 3-20 for unit errors, Units - Diesel use is litres per day not kL/d? Review assumptions and calculations	A unit error has been identified. Updated calculations have been included in Appendix F.
9	3.11 Effective and efficient mining, page 184	"*Conventional processing techniques proposed on site will extract the kaolin product from the ore and produce a final product for sale to proven markets*."	• Provide clarification on mine gate location. • Will additional processing of kaolin be required away from the mine?	At this stage, no further processing is anticipated to be required after the product is refined onsite. In the event that further processing is required as a result of any market agreement entered into, this would be subject to further separate approvals.
10	DEM mine closure	Rehabilitation - overburden stockpile will be approximately 18 m high at its highest point. It alsostates that 'Final rehabilitation will include placing a surface cover on the crest of any remaining stockpile'. Provide more detail on how much is proposed to go back into the pit. A 18m high overburden stockpile is essentially a WRD. It's clear by the figure 3 – 28 that they are doing a reasonable level of backfill. Given that they have all the volumes etc. they should be able to detail what the WRD will look like. It is implied on pg. 177 that is will be an irregular shape but is expected to be approximately 550 m long, 300 m wide and 18 m high.	Provide information on strategies proposed to achieve proposed final land use. Noting it is proposed to leave an overburden stockpile and a small pit void after mining	There is not a requirement to rehabilitate the site to as close as possible to the natural landscape. Rehabilitation is defined as the return of disturbed land to a state agreed by relevant stakeholders and defined in the PEPR. The objective for final land use is to make the site safe and stable, with domains revegetated with either native vegetation or introduced fodder plants. In the event a small pit void remains, a safety closure bund would be installed in accordance with the guideline issued by the Western Australian Department of Industry Resources (DIR 1997). The bund would be vegetated. The overburden stockpile and safety closure bund would be designed and audited post-constructed to ensure geotechnical stability over the long term and include standard industry erosion mitigation strategies. Further context: The Company has committed to revegetating with native species and/or introduced fodder plants. This would be determined through the duration of operations and will likely include a mixture across the site. The requirement for post mine land use is safe and stable, and the Company must ensure that the post mining areas are designed such that they do not cause a hazard into the future. Part of this work will be to identify through trials which plant species best suits the requirements, natives or introduced fodder plants. During the PEPR phase, closure domains will be delineated, and proposed vegetation species will be identified for each domain as the priority revegetation species for closure for that area. The remaining overburden stockpile will be finalised through the PEPR phase, as the pit design, material movements, overburden and backfilling schedule will be presented in the DFS. The overburden stockpile will be designed to ensure geotechnical stability over the long-term and include standard industry erosion mitigation strategies.

#	Reference	Description of Matter Raised by SA Government	Further Information or Clarification Required	The Company's Response
11	DEM mine closure	• Risk of AMD • Acid risk assessment was based on small sample size without long term leach testing. Proposal refers to a Conceptual Acid and Metalliferous Drainage Management Plan (CAMDMP), which includes an Acid and Metalliferous Drainage Assessment that was has been completed by the University of Adelaide (Thomas 2020).	Describe confidence in the assessment of risk of AMD associated with project from the acid Risk assessment. Noting the Conceptual Acid and Metalliferous Drainage Management Plan (Thomas 2020) was not included with the proposal.	See Appendix G for the Acid and Metalliferous Drainage Assessment (previously referred to as Thomas, 2020).
12	DEM Noise Sec 2.16 and Chapter 13 Appendix L Noise and Vibration assessment	TOR 006 – clause 1.17 and MG2a Page 34 Noise - Provide a description and measurement data of the existing levels of noise and contributors to noise (both natural and anthropogenic). Section 2.16 and chapter 13 of the proposal describe existing levels of noise and contributors of noise, both natural and anthropocentric. Existing noise levels are described as "quiet". The proposal does not provide measurement data of the existing levels of noise for the site or at sensitive receivers. The Noise and Vibration assessment, appendix L states "it is not considered necessary to undertake background noise logging at noise sensitive receivers. The existing noise environment can already be characterised as 'quiet', typical of a remote rural location." TOR006 and MG2a require measurement data for existing levels of noise and contributors to that noise. Existing (pre mining) noise level data provides baseline information which supports a fulsome description and understanding of the impacts to sensitive receivers due to noise.	Provide a description and measurement data of existing levels of noise as required by TOR 006 – clause 1.17	A baseline noise report has been completed and included in Appendix E.
13	DEM Water 3.7.3	Mains Water supply Page 164 states that SA Water have indicated it is possible for a water supply to be made available to support the Proposed development. The proposal goes on to state the water supply network would be subject to any required network upgrades to ensure existing customers are not impacted. In order to assess confidence that an environmental outcome can be achieved, aspects required by Regulation 46 must be addressed.	Provide information (reports, studies or communications) supporting claim that existing customers would not be impacted by SA water supplying mains water to the mine. Include reference to minimum standards of SA Water mains water supply.	SA Water has responded to questions raised regarding water supply and reliability, this has been included in Appendix A. <u>Further information</u> Section 25 of the Water Industry Act requires the Commission to make a water retail licence subject to conditions determined by the Commission, including requiring the licensee to comply with minimum standards of service and requiring the licensee to monitor and report as required on service performance indicators. As noted above, in the case of SA Water, the statutory obligation to meet service standards already exists noting that the objects of the *Water Industry Act 2012* include: "…to provide for and enforce proper standards of reliability and quality in connection with the water industry…"[14] The Water Industry Act requires the Commission to make a water retail licence subject to conditions determined by the Commission, including requiring the licensee to comply with minimum standards of service and requiring the licensee to monitor and report as required on service performance indicators.[15] The maximum penalty for a contravention of a licence condition is $1 million.[16]

#	Reference	Description of Matter Raised by SA Government	Further Information or Clarification Required	The Company's Response
				Generally, enforcement action in relation to a licence condition would be pursued in the case of persistent non-delivery of performance that could not be rectified through other means.[17] [14] Section 3(d) of the *Water Industry Act 2012* [15] Section 25 of the *Water Industry Act 2012* [16] Section 27(1) of the *Water Industry Act 2012* [17] Ofgem, RIIO: A New Way to Regulate Energy Networks-Final Decision, October 2010, Page 30; available at https://www.ofgem.gov.uk/ofgem-publications/51870/decision-doc.pdf.
14	DEM Groundwater MP S2.6.1	The description of the Garford Formation is inconsistent with those provided in Appendix J and Figure 2-10. In Section 2.6.1, Under "Hydrogeology identification" the Garford Formation is described as *clay/mudstone Tertiary sediments*. Appendix J, Section 3.4.1, however, describes the Garford Formation as "…*consists of a basalunit of coarser grained and cleaner yellow-orange sand ranging in thickness from 1 m to 4 m overlain by 4 m to 8 m of fine grained orange silty sands with ferruginous mottles toward the base and an increase in clay content to the west (i.e. sandier to the east)*. There is a large difference, from a hydrogeological perspective, between clay/mudstone and sand. The description provided in Appendix J seems to be accurate and should be followed inthe MP. *"The aquifer is unsaturated over most of the proposed pit, with saturation inferred to occur in anarrow trough-like area along the north eastern portion of the proposed pit."* An aquifer, by definition, is saturated and there is no "*unsaturated aquifer*". Suggestion: theGarford Formation may be unsaturated in places. TOR006 1.6	Revise description of the Garford formation to ensure consistency between main document and Appendices.	Description of Garford Formation below: The Garford Formation is described in the Aldam Geoscience Stage 1 report, referring to the STREAKY BAY 1:250000 geological map legend that describes the Garford Formation as 'comprising fine to coarse grained orange, pale yellow, red and purple angular to well rounded silty sand; khaki to grey-green and brown silty clay and black carbonaceous clay and silt. Silcreted and ferricreted horizons common'. In the bulk sampling report also referred to on page 21 of the Stage 1 report, the Garford Formation as encountered on site is described as 'consists of a basal unit of coarser grained and cleaner yellow-orange sand ranging in thickness from 1 m to 4 m overlain by 4 m to 8 m of fine grained orange silty sands with ferruginous mottles toward the base and an increase in clay content to the west (i.e. sandier to the east). Silcrete horizons occur extensively in the basal unit.' Drilling on site indicated that the Garford Formation was comprised of sand and clayey sand. Additional comment referring to the text "The aquifer is unsaturated over most of the proposed pit, with saturation inferred to occur in a narrow trough-like area along the north eastern portion of the proposed pit", with the comment that 'An aquifer, by definition, is saturated and there is no "unsaturated aquifer"'. This point is taken and all references to unsaturated aquifers should be removed.
15	MP S2.6.1 Fig 2-18 and S 3.4.8 Fig 3-13 of the MP	The conceptual hydrogeology block diagrams could benefit from displaying the water table and the proposed pit outlines; and perhaps colour coding the units according to their anticipated hydraulic conductivity (aquifer, aquitard, aquiclude). TOR006 1.6	Review diagrams for clarity if required.	See Figures 3-14 and 3-15 of the MP.
16	MP S11	No groundwater specific outcomes and associated criteria are proposed on the grounds that noSPR was confirmed. Dewatering (working beneath the water table) is proposed in an open pit therefore there will be impacts on the groundwater environment in the vicinity of the pit, even if users or GDEs are absent. In addition, an uncertainty analysis, yet to be completed for the groundwater model, may predictan enlarged range of drawdown influence zone around the pit. It is possible that this zone extends to the nearest well or potential future users. TOR 006 Section 4	Review Source PathwayReceptor analysis for groundwater Provide an uncertaintyanalysis for the groundwater model	An impact is defined by *Any change to the environment wholly or partially, directly or indirectly, caused by mining operations, which is confirmed through the presence of a source, pathway and environmental receptor.* Where there is no identified receptor, there cannot be an impact event. Without an impact event, an outcome is not required. With no third party groundwater users or groundwater dependent ecosystems (GDE)s identified within the area of influence which can be credibly impacted (as the aquifer is hypersaline and users are too far from mining operations), there is no requirement for an environmental outcome.

#	Reference	Description of Matter Raised by SA Government	Further Information or Clarification Required	The Company's Response
				An Environmental Outcome is defined as "An outcome is a statement of the appropriate level of impact on the environment, which may be no impact, caused by the proposed operations following the implementation of control measures and strategies…" Additionally, the environmental value of the groundwater is defined by the Water Quality Policy 2015 as suitable for Primary industries— livestock drinking water and aquaculture and human consumption of aquatic foods. That is, underground waters with a background TDS level of 3 000 mg/L or more, but less than 13 000 mg/L. Sampling and analysis of groundwater indicated a neutral to slightly alkaline pH with moderate to high salinity (generally between 6,000 and 20,000 mg/L TDS). The Garford Formation is considered to be an unconfined aquifer with low yields, low transmissivity and low conductivity, whereas the (Partially Decomposed Granite) PDG-granite aquifer had high yields recorded during air lift development, but lower yields obtained during test pumping. Drawdown was recorded during test pumping and recovery was slow. This implies groundwater present within the PDG-granite aquifer is compartmentalised with fractures not uniformly connected. The PDG-granite aquifer likely varies between confined and unconfined. Uncertainty Analysis included in Appendix H.
17	S 3.4.2	The top section of the fresh granite may have appreciable hydraulic conductivity, i.e. could bean aquitard or even an aquifer as opposed to the aquiclude classification used.	Provide a justification forthe aquiclude classification or amend the text.	The top section of granite is kaolinised and is considered an aquitard (Layer 2: Kaolinised granite (confining layer)), but the PDG and underlying fresh granite are considered to form an aquifer (Layer 3 PDG – granite basement (confined aquifer) in the model. The stage 1 report included reference to aquiclude but his was changed to aquitard in subsequent reports - refer section 3.4.2 (aquiclude) and section 5.7 (p 57) and section 8.2 page 66 of the groundwater summary report (MP Appendix J).
18	S 3.4.4	The effective porosities (0.2 or 0.5) appear to be very large for the strata described and need further justification or changing. If smaller effective porosities are used, the radius of influencemay be larger, and the estimated inflow smaller than those estimated in Figure 18. The Thiem Equation is steady-state while the Weber is transient. The radius of influence fromWeber, after one year, was used as an entry to the steady-state calculations. Why was one year selected?	Provide a justification forthe effective porosity values used and the explain use of one year in the Weber Equation.	These were preliminary estimates only to indicate possible inflow rates. Time at 1 year was used for initial estimates purposes. Agree that there are numerous steady state solutions for estimating RO and we adopted this with regard to several published methods at other Australian mine sites.
19	S 4.3 and Fig 24	The text refers to "*The constant head cell values were set based on the* *interpolation of measured groundwater levels from monitoring wells within the proposed pit area(upstream cells), and by inspection of regional WaterConnect historical water level data (downstream cells)*." A model-independent groundwater elevation contour map, with datapoints and labels (m AHD)should precede Fig 24. A 'composite' (all times and formations) map may suffice. TOR006 1.6 and 5.1.1.3	Provide a groundwater elevation contour map, with datapoints and labels (m AHD).	See Attachment 7, Appendix H.
20	S 3.3.1, 4.4 and Figure 26	CWMW004 was previously referred to as incomplete in Section 3.3.1. Section 4.4 refers to agroundwater head measurement from that well. These inconsistencies (how can a	Clarify the status of CWMW004.	Table 1 of the groundwater summary report (MP Appendix J) presents a standing water level of '18.15 (before casing broke)', i.e. the depth to water was measured and the well casing subsequently failed. It was abandoned due to casing failure.

#	Reference	Description of Matter Raised by SA Government	Further Information or Clarification Required	The Company's Response
		measurement be made in an incomplete well?) require explanation.		
21	Tbl 4	Explain the logic and provide justification for the choice of Kv/Kh = 100 for Layer 2. This is arather uncommon choice.	Provide justification	This is a typographical error, as it should be Kh/Kv. It should also be noted that these parameters are from the initial "channel" model which was superseded by the updated model following field investigations. The updated value is Kh/Kv = 1 consistent with a kaolin layer without features such as bedding, jointing, etc.
22	S 4.4	*"The modelled layer 3 heads approximate the observed heads in monitoring wells within an adopted variation of +/-2m, and also produced a groundwater flow direction inferred by thefield data (site and regional) and consistent with the conceptual hydrogeological model."* Figure 25 indicates no measurements to the E, SE of the pit hence the statement should be restricted to the pit surrounds and where data are available. The head contours in Figure 25 in the SE, and further away from the pit seem to reflect boundary conditions rather thanobservations.	Amend the statement asrequested.	This earlier "channel" model was superseded by the updated model following field investigations. This refers to the superseded Stage 1 groundwater summary reporting and rather than amending, will be deleted from revised reporting for the PEPR.
23	Fig 25, 27 and 28	These maps seem to suggest a small downward vertical hydraulic gradient from Layer 1 to Layer 3. Please refer to comment # 14 for another comment on the vertical hydraulic gradients. At this (early) stage, it is unclear to me what the best conceptualisation of the kaolinised granite(KG) is. It is also unclear if the conceptualisation presented here is the only one feasible. Sections 3.4.1 and 3.4.2 appear to describe the KG as an aquiclude but the groundwater elevations do not seem to indicate much confinement. Hence keeping an option, that it mayallow some leakage (KG k is > clays) may be the best for future work. Understanding the regional hydrogeological setting better would also help. In some settings, between the recharge and discharge areas, groundwater heads from different depths may besimilar even if the intervening layers are aquicludes. Such zones are characterised by, and named horizontal flow. Is this setting perhaps an example for such an area?	If appropriate, a description/explanationfor the small downwardvertical hydraulic gradient is required. To note and incorporatethe possibility of alternative conceptualisations into further work.	The data on these maps pre-date the field work so any conceptualisations in this section has been updated in the later reporting. Aquiclude was stated in section 3.4.2 of the groundwater summary report (MP Appendix J). This is in the stage 1 groundwater summary report and was not used in later work as we subsequently considered the Kaolinised Granite to be an aquitard. Later reporting = stage 2 groundwater investigations, section 5.7 and also section 8.2 (model configuration) of the groundwater summary report (MP Appendix J).
24	Fig 32 to 35	These figures need a timestamp, ie when were the measurements made; or are themeasurements composite (from different times)? Figure 35 - the hydraulic gradient/flow could be interpreted as more towards the NE, as opposed to the inferred flow to the E. The contour lines as they are drawn at present assume no flow between CW20WB003 (92.4 m AHD) and CW20MB003 and CW20MB006 (at just over90 m AHD). This alternative	Provide a comment, amend text and figure if appropriate	The contours are consistent with the assumption of a hydraulic unit which combines the Kaolinised Granite and granite basement e.g. gradients between CWMW001 and CW20MW002 and CW20WB003. Further data points to the east would be needed to justify significant re-interpretation. Date of measurement can be shown in Table 7 (Groundwater Summary Report, MP Appendix J).

#	Reference	Description of Matter Raised by SA Government	Further Information or Clarification Required	The Company's Response
		interpretation, more consistent with that of Figure 34, may need to be commented.		
25	Sec 5.3 and Fig35	There appears to be a steeper horizontal gradient between GWMW003 and two granite basement wells than the gradient from kaolinized granite wells. Is there a possibility that a downward vertical hydraulic gradient, between the kaolinized granite and the granite basement unit contributes to this steepness or is it the result of lateral (horizontal) changes?	Provide a comment/clarify	The Stage 2 model achieved this pattern with the higher permeability fault zone which "drains" the granite basement and Kaolinised Granite.
26	Tbl 9	Matrix k > fracture k for CW20WB003? Normally it is the other way around. Text refers to a hydraulic conductivity, which should be stated for CW20WB002 in Table 9. How can both Sy and Ss be shown for CW20WB002? The Garfield Formation is referred toelsewhere (Section 8.2) as unconfined; if so how can Ss (specific storage for a confined aquifer) be assessed from a pump test?	Address points raised	*Matrix k > fracture k for CW20WB003? Normally it is the other way around'*. RESPONSE: In the absence of any actual observations of the subsurface granite rock mass and defects, it would be reasonable to assume that Kf > Km, but it is not inconceivable that the reverse could be true. The Moench solutions provided a reasonably good match to the observed drawdown and recovery data and were therefore adopted. Note the analytical results were insensitive to assumed fracture spacing with the same results obtained for values of this parameter of 1 m and 10 m. *-'Text refers to a hydraulic conductivity, which should be stated for CW20WB002 in Table 9'*. RESPONSE: The table quotes the analytical value derived from the Aqtesolv analysis of T = 0.2 m2/d. The text then describes that for an assumed saturated thickness of 4 m (estimated from the bore log and swl data) that this equates to an approximate k = 0.05 m/d. Table 9 was intended to only report the analytical Aqtesolv results to separate these from any further manipulations or assumptions – Table 9 could be clearly labelled as such. *'How can both Sy and Ss be shown for CW20WB002? The Garfield Formation is referred to elsewhere (Section 8.2) as unconfined; if so how can Ss (specific storage for a confined aquifer) be assessed from a pump test?'* RESPONSE: The value of storativity is derived from the Neuman solution.
27	Fig 49	"*calibration*" is not necessarily an evidence that there is a high k zone in Layer 3 because of thenon-uniqueness of groundwater models. The logic of the relationship between the fault traces and the location of the high k zone needsto be explained/justified.	Explain the relationship/justify the correlation between thefault traces and the location of the high kzone	The modelling indicates this is needed to get a reasonable correlation with observed heads, agree it does not prove the high k fault zone exists but consider it is a plausible solution given the available geological and hydrogeological data.
28	Appendix J	There are no sensitivity and uncertainty analysis for the groundwater model in Appendix J.These analyses are integral part of any numerical model and should be completed to get a better appreciation about a range of outcomes.	Provide a sensitivity anduncertainty analysis for the numerical model.	Model sensitivity analyses have now been conducted and are presented in the Appendix H. It is important to acknowledge that the sensitivity analysis has highlighted the limitations of the existing model for modelling drawdown responses at distance from the pit, with model domain boundaries affecting the modelled responses for the low Sy and high k scenarios. Further discussion of these limitations in the context of the initial objectives of the model as a guide to pit dewatering estimates are provided in the Appendix H.

Table 3-4 Matters raised by the Department for Environment and Water

#	Reference	Comment	Further Information or Clarification Required	The Company's Response
29	DEW Groundwater	Groundwater potential impact context: • Water supply (pressure and quality) for other users identified within the expected groundwater area of influence due to mining activities. • Degrading of groundwater within the PDG-fractured granite aquifer by surficial processes such as drought and contamination when the kaolinised granite, which is theconfining layer and acts as a protective cover, is removed. • Creation of post-mining sand aquifer (surrounded by relatively low permeable material),its water quality, local groundwater mounding after heavy rainfall. (Note that sand may be returned to the open pit following separation from the ore during processing activities). • Non-GDE native vegetation communities (e.g. the Mallee woodland vegetation) impacted as a result of saline groundwater elevation due to seepage from depositedsand. • Although not explicitly stated, the implication is that the proposed mining operation is unlikely to impact the Robinson Lens, a historical water resource used by SA Water, butcurrently not in use. The Robinson Lens is located approximately 15 km away to the east from the proposed operations. In the context of the information presented this appears to be a valid assumption, however a sensitivity and uncertainty analysis would help establish this further. With respect to the general description of hydrogeology, the following points require clarification: o Whilst there are two laboratory-derived coefficient of permeability values for thekaolinised granite, only one is used and quoted as representative. Please explain why the other result, which is greater than the adopted value by approximately two orders of magnitude, is not used. If it is a valid result, pleaserectify assessment to include this result. Alternatively, please highlight or add the explanation as to why it was not used. o By extension, the kaolinised granite is generally described as an aquitard or aconfining layer, although the possibility of limited hydraulic communication through this unit is acknowledged. The current conceptualisation is consistent with features of the hydrogeology such as generally equal heads in various aquifers as well as observed water table intersects that are not confined by stratigraphy and also inclusive of the kaolinised granite. However, an alternative conceptualisation that describes the kaolinised granite as a leaky aquitard is also supportable. There is currently no uncertainty or sensitivity analysis within presented modelling to determine whether such alternative conceptualisations present any variance in risk profile. o The presence of calcrete and silcrete sheets in the near surface and at depth suggests in some places groundwater ingress and flow may not be completely diffuse, but may have fractured rock or karstic aquifer characteristics. Whilst this is recognised as a possibility, the favoured conceptualisation is one of predominantly diffuse groundwater ingress. Backfilling of the pit after removal of a low K kaolinite ore with a higher K sand by-product may also cause increased recharge localised to the pit and therefore pit-related groundwater mounding. Further discussion on the likelihood (or otherwise) of focussed recharge across the site and the	Provide a sensitivity and uncertainty analysis of the potential for mine operationsimpact the Robinson Lens Provide analysis and additional information as required on interaction between backfilled pit and local groundwater – contributing to understanding risks due to backfilled pits and how they will function in the post mining landscape	The Robinson Lens is located about 40 km to the west, a distance considered sufficiently large to preclude the need to conduct analyses specific to this query. See Appendix H, Attachment 1 for the location. Uncertainty Analysis included in Appendix H. Backfill modelling to be carried out on final pit design for PEPR Rainfall inflow from will suppress water from PDG aquifer rising into Garford – modelling to confirm. Updated consolidated groundwater report will be presented for the PEPR.

#	Reference	Comment	Further Information or Clarification Required	The Company's Response
		uncertainty this alternative conceptualisation may present would be helpful to clarify risks. With respect to numerical modelling, the following points require clarification: o The structure of the numerical model reports should follow the Australian Groundwater Modelling Guidelines. o Model structure in terms of tops/bottoms of model layers (including the top and base of the model) is not adequately presented and described. o Brief description the software and the Graphical user interface (GUI) used and why/how it is suitable for mine dewatering and recovery simulations after the end of dewatering is lacking in the report. o Simulated contours (Figures 61, 64 and 67, Appendix J) extended to lateral limits of numerical model domain after 26 years; this indicate that the lateral extent of the model domain is inadequate. o Open-pit mine dewatering conceptual model has not completely been translated into the numerical groundwater flow model. The proposed mining o method is 'cut-and-fill' as mining progresses, however, filling of the pits as mining operations are completed in various pit stages were not simulated in the pit dewatering model.		
30	Section 2.6, pg 42	A map showing the Robinson Lens, the Kappawanta and Bramfield Basins and the Polda lens in relation to the site would help visualise the distances between and therefore the relative risk the development has on these particular groundwater resources	Provide a map or plan showing regional groundwater formations.	These basins and lenses are located over 40 km distant – to the south (Polda, Bramfield, Kappawanta) and west (Robinson). This is shown in Appendix H, Attachment 1.
31		Although not explicitly stated, the implication is that the proposed mining operation is unlikely to impact the Robinson Lens, a historical water resource used by SA Water, but currently not in use. The Robinson Lens is located approximately 15 km away to the east from the proposed operations. In the context of the information presented this appears to be a valid assumption, however a sensitivity and uncertainty analysis would help establish this further.	Provide a sensitivity and uncertainty analysis of the potential for mine operations impact the Robinson Lens	The Robinson Lens is located about 40 km to the west, a distance considered sufficiently large to preclude the need to conduct analyses specific to this query. See Appendix H, Attachment 1 for the location. Uncertainty Analysis included in Appendix H.
32	Section 2.6.1. pg43	"The KG likely functions as an aquitard between the PDG-granite basement rock and the Garford Formation." In contrast, on Pg 46 ". Some vertical leakage between hydrogeological units is possible". Appendix J, section 3.3.2 and Section 3.4.2. The paragraph prior to figure 6 suggests that the water table is not restricted stratigraphically but is continuous (and therefore implied connected) across the Garford Formation and the Kaolinised Granite "*The green dashed line indicates approximately where the water table transitions from within the kaolinised granite to the west, to within the Garford Formation to the east*…." Note also that Table 7, and Figures 32 and 33 suggest water levels in the Garford Formation and underlying Granitic aquifers are verysimilar and not particularly suggestive of a vertical gradient between the two. However, Section3.4.2, dot point 9 conceptually describes the kaolinised granite as "*a confining layer separatingthe underlying partially decomposed granite layer from the overlying Garford Formation*." The current conceptualisation is consistent with features of the hydrogeology such as generallyequal heads in various aquifers as well as observed water table intersects that are not confinedby stratigraphy and also inclusive of the kaolinised granite. However, an	Provide a modelling analysis of uncertainty and sensitivity with respect to the hydraulics of the study area so the risks regarding uncertain K values can be better appreciated.	The Kaolinised Granite is considered to be a confining layer – an aquitard due to it being a clay (sandy, silty, clayey and combinations of these). All units have the potential for vertical leakage to occur if they have even a small kv. The focus of these comments is the Stage 1 groundwater summary report conceptualisation which was updated after the Stage 2 field program (refer Section 5.7). The green dashed line is the limit of saturation in the Garford Formation. The figure is from the Stage 1 of the groundwater summary report and has become superseded. The Stage 2 groundwater summary report modelled steady state head difference maps indicate that over most of **t**he model domain there is a downward gradient of up to 1 m between layer 1 to layer 2, and layer 2 to layer 3. The gradient is reversed to an upward gradient of 2 m or more in a small area in the central north of the model domain where recharge is mostly applied to layer 3 (top active layer) due to palaeotopography. Uncertainty Analysis included in Appendix H.

#	Reference	Comment	Further Information or Clarification Required	The Company's Response
		alternative conceptualisation that describes the kaolinised granite as a leaky aquitard is also supportable. There is currently no uncertainty or sensitivity analysis within presented modelling to determine whether such alternative conceptualisations present any variance in risk profile.		Agree that a leaky aquitard is possible, and a sensitivity analysis has been carried out on kv and kh for the kaolinised granite layer 2 (Appendix H).
33	Section2.6.1, figure 1-18; Section 3.8, figure 3-13; Appendix J, Section 5.6, figure 36.	The conceptual block diagrams throughout the document do not clearly indicate the followingobservations concerning the hydrogeology of the site a) The Garford Formation for the most part is unsaturated ("dry"), with only a small portion withany notable permanent saturation found near the northern corner of the pit. b) The water table level in the cross-sectional view of the block diagram. c) Based on Comment 3 an acknowledgement of possible limited communication through theKaolinised Granite Likewise, acknowledgement recharge could be localised through dissolution features in the Bridgewater Formation calcrete sheet horizons.	Review and update relevant diagrams.	Figures 36 and 37 both show the SWL, where the Garford Formation is below this line it is saturated. The schematic could be altered to include saturation in part of the Garford Formation. Vertical arrows could be included to indicate (limited) vertical movement of infiltrating water. Site investigations by the Company indicate that sheet calcrete occurs in some parts of the Bridgewater Formation but not everywhere. Where calcrete has been exposed, it is often rubbly and nodular and in areas where hard calcrete has been exposed in the sides of excavations, it is regularly jointed with joint spacings of less than 1 m (refer Appendix H, Attachments 2 to 4). There is no evidence on site to suggest that the Bridgewater Formation includes large (model cell sized or greater) areas of impermeable calcrete capping. Dissolution features have been observed but are small and along with jointing, occur at spacings of less than 1 m to several metres. Given the model cell sizes range from 40 m x 40 m to 80 m x 80 m, we consider the matrix of joints cracks and dissolution features to be uniformly and sufficiently closely spaced for the recharge through the Bridgewater Formation to occur uniformly across the model domain.
34	5Section 2.7, pg 51.	"*The recharge process is assumed to be predominantly diffuse; however, where geological features such as dissolution features at the surface or within the shallow subsurface allow, the recharge process may be localised.*" Appendix I, Section 8.2 The recharge process is "*…assumed to be predominantly diffuse but may be localised in areas where geological features such as dissolution features at the surfaceor within the shallow subsurface allow.*" Appendix J, Section 3.4.2.dot point 16; Section 5.7, pg. 56. Statement made that "*Recharge / infiltration through the calcrete (of the Bridgewater Formation) horizons occurs uniformly across the model domain.*" However, In Appendix M, section 2.2.2.3, the statement is made that "*…the calcrete of the Bridgewater formation is highly transmissive due to solution features and fractures in the brittle rock and pooling at topographical lows would form recharge points.*" In the next paragraph in Appendix M, Section 2.2.2.3, differences in groundwater salinity are speculated to " … *indicate a structural change in the surface geology which is controlling the salinity of the groundwater.*" Appendix J, section 3.3.1 and section 3.3.9 suggest there is a notable variance in salinity values across the site notwithstanding suspected erroneous readings in historical data. Further justification for the conceptualisation of predominantly diffuse recharge is required. Comment how extensive these calcrete sheets are known to be and therefore the likelihood of focussed recharge via karstic or structurally controlled fracture features versus diffuse. Further,comment on the implications this may have for groundwater management during the operational life of the mine.	Review groundwater recharge explanation for consistency.	Whilst it is acknowledged that localized recharge may occur, we have assumed at the modelled scale that water percolating through the closely and regularly spaced cracks and dissolution features in the Bridgewater Formation will form a uniform recharge front. Appendix I was written at an early stage in the investigation and some concepts were superseded (as could be the case for stage 1 groundwater study and the stage 1 numerical model). No implications on groundwater management during mining are expected.
34	Section11.	Provide a statement regarding the predicted impacts (or otherwise) on the basis of current conceptual and numerical modelling on the specific groundwater resources of the Robinson Lens, the Kappawanta and Bramfield Basins and the Polda lens. Provide a summary of supporting evidence.	Review source pathway receptor relationship between mining operations and regional groundwater basins	Uncertainty Analysis included in Appendix H. A diagram of groundwater basins has been provided in Appendix H, Attachment 1. The Robinson Lens, the Kappawanta and Bramfield Basins and the Polda lens do not intersect the area of influence and distance between the resources and the mining operation are included below:

#	Reference	Comment	Further Information or Clarification Required	The Company's Response
				• Robinson Lens 40 km • Kappawanta 100 km • Bramfield Basins 90 km • Polda Lens 90 km
35	AppendixJ:	The structure of reporting is not conducive to producing a cohesive and understandable message. Note that whilst the structure of this appendix is interesting with respect to seeing how the conceptualisation has changed and developed over time, it diminishes comprehension of thefinal conclusions. The structure of the numerical model reports should follow the Australian Groundwater Modelling Guidelines (Barnett et al. 2012). http://www.groundwater.com.au/media/W1siZilsIjIwMTIvMTAvMTcvMjFfNDFFormationzZfOTYwX0F1c 3RyYWxpYW5fZ3JvdW5kd2F0ZXJfbW9kZWxsaW5nX2d1aWRlbGluZXMucGRmIl1d/Australian-groundwater-modelling-guidelines.pdf	For noting	This comment is noted and is a result of providing documentation of all stages of the work. The AGMG recommends a minimum of 3 stages of reporting, or that reporting uses the following structure: • after conceptualisation and model design • after calibration and sensitivity analysis • after predictive modelling and uncertainty The current reporting in the Groundwater Summary Document (Aldam, 2020) includes the relevant information for conceptualization, model design, calibration and predictive modelling. Sensitivity analysis and uncertainty have been addressed with work subsequent to that report (refer Appendix H).
36	AppendixJ, section 3.3.2. Figure 6.	The presentation does not make it clear as to whether the Garford Formation is continuous across the study area or not. Note that Section 3.4.2 states that the Garford Formation is indeed present across the entire study area. Suggest a different presentation, perhaps via the use of dashed contours or imagery, to clarify this.	Review and revise for consistency	The isopachs shown are interpolated in areas where drillhole data exists. The Garford Formation has been intersected in all drillholes.
37	AppendixJ, page 22, section 3.4.1. of MP49639 28A-V3	'… *Kaolinised granite intervals are generally of very low hydraulic conductivity. In a groundwater context, they act as confining layers to aquifers, forming a barrier to the (vertical) movement of water. At Great White, it is likely that the kaolinised granite is acting as a confining layer and separating water in the partially decomposed granite and granite basementfrom water (where it exists) in the Garford Formation.*' Notwithstanding comments regarding the K values used for the Kaolinised Granite and assuming they are indeed uniformly low, stripping the kaolinised granite would potentially expose the PDG-Granite aquifer to pollution/contamination and potential for aquifer intercommunication and co-mingling of groundwater from the Garford and PDG-Granite aquifers.	Provide comment on the likely distance any local groundwater contamination could travel within these aquifers given K values?	During pit excavation the Garford formation would also be removed. Hydraulic connection between the Garford Formation and Granite Basement would therefore not occur except along the eastern flank of the pit and here only by seepage through the pit face. It is expected that such seepage will be collected and used for dust suppression. The modelled steady state head difference maps indicate that over most of the model domain there is a downward gradient of up to 1m between layer 1 to layer 2, and layer 2 to layer 3. The gradient is reversed to an upward gradient of 2 m or more in a small area in the central north of the model domain where recharge is mostly applied to layer 3 (top active layer) due to palaeotopography. Travel distances would depend locally on aquifer extents and properties and hydraulic gradients established by the mining process.
38	Appendix J page 25, section 3.4.4 of MP49639 28A-V3:	Preliminary assessments of a possible range of groundwater inflows to pit excavations. Figure 18 – analytical equations Conceptually the radius of influence (RoI) would increase as horizontal hydraulic conductivity ofthe aquifer, mine penetration of the water table, and mine radius increases; and would decrease as aquifer recharge increases would decrease as aquifer recharge increases a. Was sensitivity analysis of RoI to K and RCH carried out? Table 3: Sub-pit Parameters Were the hydraulic conductivity (K) values used equivalent Ks?	a. There are lots of different equations available to estimate the Radius of Influence (RoI). Why was the Weber equation selected? b. Why was 1 year (365 days) used in estimating RoI when mining would last 26 years? c. How were the numerical values of the radii of the	This section refers to Stage 1 of the Summary Groundwater Report. The analytical approach used to provide preliminary estimates of possible pit inflow rates and were done prior to obtaining more detailed site hydrogeological data from the Stage 2 drilling and aquifer testing investigations. The calculations have been superseded by the Stage 2 groundwater modelling. a) Agree that there are numerous steady state solutions for estimating RO and we adopted this with regard to several published methods at other Australian mine sites. b) Time at 1 year was used for initial conservative pit inflow estimates prior to detailed mining schedule information. c) The estimates are very approximate based on a preliminary pit extent and approximate extents of where the pits would intersect the water table, assumed to be in either the

#	Reference	Comment	Further Information or Clarification Required	The Company's Response
			pits determined? Are they equivalent radii? d. Please provide the assumptions underlying the analytical models used, including • Was the aquifer assumed unconfined? • Was recharge assumed negligible? • Was flow from the base of pit assumed negligible? • Was the base of the pit coincident with the base of the aquifer (or top of fresh unfractured granite)? 50% effective porosity or specific yield of the aquifer is not considered reasonable. Provide justification for this assumption	Kaolinised Granite or GF at that stage of understanding. This is also superseded by the later work. d) Yes Yes Yes Yes, approximate base of Kaolinised Granite (not aquifer) Agree that effective porosity for the Kaolinised Granite clay material would be much lower than 50% but this (theoretical clay porosity) was conservatively adopted for pit inflow estimates. Note, these initial estimates (Stage 1 of the Summary Groundwater Report) were superseded by later numerical modelling. K values for the Kaolinised Granite in sub-pits 2 and 3 are an average of the estimates obtained from test pumping of wells CWMW001, 2 and 3 (Groundwater Science, 2019). The k value for the GF in sub-pit 1 was an initial estimate in the absence of field data. The geometry of the pit and all hydraulic parameters have since been changed and reflected in the Stage 2 numerical modelling.
39	Appendix J, Section 5.5, Table10; Section 8.3, Table 16; Section 8.4, pg 76 Section 8.5, pg. 88;	There are two coefficient of permeability results obtained: 0.06m/d (CW20WB002) and 0.0001 m/d (CW20WB003) there is approximately two orders of magnitude difference between these values. Both results in Table 10 are described as being obtained from a "kaolinised granite" There is a difference in described lithology, with the former described as a clayey sand and the latter as a sandy clay. The rest of the report uses only the result from CW20WB003 as representative of k values for the Kaolinised granite. There is inadequate explanation for only choosing the lower of the two values, rather than using an average of the two, or the higher of the two.	Provide an explanation as to why only one result was used to characterise k for the kaolinised granite	Refer to updated sensitivity report (Appendix H and Appendix H, Attachment 5, which is a graph showing increased flows with increased k. Note as with the other sensitivity runs where k is changed, the heads and drawdowns are affected by not re-calibrating the steady state model, however this gives an idea of the effect. Two push-tube samples were collected at this location as the first sample from CW20WB002 was thought to have been a transitional sample between Kaolinised Granite and PDG. The shallower sample from CW20WB003 is of Kaolinised Granite. The lower value was adopted because the higher value may not be representative of kaolinised granite. On site, Kaolinised Granite is a white saprolitic clay with quartz grains that bears little resemblance to the rocks from which it is derived, whereas the PDG retains much of the appearance and some of the mineralogy of the granite from which it is derived (ref Appendix H, Attachment 6).
40	Page 270	Although the no dinosaur Ants were observed, the applicant is asked to repeat (possibly on a number of occasions) the Dinosaur Ant (Nothomyrmecia macrops) survey work undertaken by Ecological Horizons to ascertain with more confidence if these ants are found in the mining lease area or not.	Consider ongoing monitoring for presence of Dinosaur Ant (*Nothomyrmecia macrops*)	The Company will consider implementing a monitoring program to verify the presence or lack of presence of Dinosaur Ants (*Nothomyrmecia macrops*).
41		Groundwater mounding may have a negative impact on adjacent mallee vegetation.	Review impact and risk assessment for the potential of groundwater	Groundwater mounding is not expected as a result of backfilling the pit, however will be reviewed with updated groundwater modelling in the PEPR process – with the updated pit design, and backfilling schedule. Any native vegetation disturbance would be offset with an SEB and subject to

#	Reference	Comment	Further Information or Clarification Required	The Company's Response
			mounding to impact native vegetation.	the appropriate outcomes. Additionally, the area is subject to high evapotranspiration, which should negate the potential for any mounding, as water is evapo-transpired from the moisture-storage layers.

Table 3-5 Matters raised by the Environment Protection Authority

#	Reference	Comment	Further Information orClarification Required	The Company's Response
42		**Air Quality Impact Assessment (Northstar)** The air quality modelling report appears to have been undertaken with appropriate conservatism and covers both stages of development more than adequately. Our only concern relates to the proximity of the nearest sensitive receiver (R1) at 800m, and that the maxima predicted PM2.5 (annual) and PM10 (24-hour) are elevated (near the compliance criteria). We understand that these results may reflect the modelling conservatism,including the adopted backgrounds, but we raise the question of whether the organisation is considering a fine particle monitoring programme beyond what we understand as the baseline monitoring proposed. If monitoring of PM2.5 and PM10 will occur during operations, we suggest triangulation (at least 3 monitors) with co-located meteorology that provides enough data to determine dust origin, coupled with a proactive (using weather forecasting) and reactive (using actual wind direction and fine particle levels) operational system. The system can the inform managementto adapt daily activities to ensure dust generation is kept to a minimum.	Is a fine particle monitoring programme, to be used as a trigger, action and response plan (TARP), being considered?	A particulate monitoring program and TARP will be developed and included as part of the PEPR.
43		**Section 13 Noise and Vibration and Resonate noise report** Mining proposal erroneously claims construction noise provisions of Noise EPP apply. Construction noise provisions of Noise EPP do not apply to this project as the site is not the subject of development consent. The mining proposal claims there may be an issue with non- compliance between the hours of 6am and 7am during the construction phase. This is not correct, there are no issues with predicted noise levels, as they are predicted to meet the relevant Indicative Noise Limit (INL) for the site.	No action required.	N/A
44		**Potential non-compliance with INLs at Receiver R1 between the hours of 6am and 7am Monday to Friday** There is some discussion in the document about potential non-compliance with INL's at Receiver R1 between the hours of 6am and 7am Monday to Friday. This risk is not considered significant, but there should be recognition that noise levels may be elevated at R1 due to weather conditions on occasion. Predicted noise levels during the operational phase (all equipment and processing plant) are predicted to meet the day-time and night-time INLs set under the Noise Policy at all locations (R2-R13) except R1. Noise at R1 may exceed the Noise EPP INL for night-time (50dB(A) for a Rural area) for the operational times between 6am and 7am Monday to Friday if a penalty for a modulating noise characteristic is included. It should be noted that these predictions are based on worst case weather conditions meaning that they will not occur continuously, but rather will occur occasionally and are beyond the control of the proponent. The guidelines to using the Noise Policy state that the proponent should demonstrate that the weather conditions do not occur for a significant portion of the year (10% of the year, or 30% of any season), and if this is the case, then these results should not be used for direct comparison against the Noise Policy. The logical application of this requirement is that it applies to a continuous noise risk, and noise is only considered a risk of being excessive if it occurs for more than 10% of the total time. Weather conditions (wind less than 5m/s from a South Easterly direction) appear to occur between 10 to 15% of the year as indicated in the Resonate report (page 24 of 43). However, the risk of excessive noise is not greater than 10% of the year, or 30% of any	No action required.	N/A

#	Reference	Comment	Further Information orClarification Required	The Company's Response
		season, as the time and duration of potential concern is only between 6am and 7am Monday to Friday (i.e. 1/24 of a day). Noise is considered to be compliant for day-time operational hours, so the relevant period of risk is far below the 10% of the year that would be considered to be relevant for weather affected noise. In addition, the application of a characteristic penalty at a distance of 800m is considered highly conservative, and there is reasonable doubt that noise at this distance would be dominated by noise modulation as is required for a penalty to apply.		

4 Glossary

Table 4-1 Acronyms and Abbreviations

Acronym	Expansion
ACN	Australian Company Number
AEP	annual exceedance probability
ALARP	as low as reasonably practicable
AMD	Acid and Metalliferous Drainage
AQ EPP	Environment Protection (Air Quality) Policy 2016
AQMS	air quality monitoring station
ASS	acid sulfate soil
ASX	Australian Securities Exchange
BAM	Bushland Assessment Method
BDBSA	Biological Database of South Australia
BOM	Bureau of Meteorology
CEP	Community Engagement Plan
Cth	Commonwealth
DCSB	District Council of Streaky Bay
DD	diamond drilling
DEM	Department for Energy and Mining
DEW	Department for Environment and Water
DFS	definitive feasibility study
DIT	Department of Infrastructure and Transport
DSO	Direct Shipping Ore
EL	Exploration Licence
EMS	Environmental Management System
EPA	Environmental Protection Authority (SA)
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999 (Cth)
EY	exceedance per year
FTE	full-time equivalent
GDE	groundwater dependent ecosystem
GHG	greenhouse gas
GSK	Great Southern Kaolin
IBRA	Interim Biogeographical Regionalisation of Australia
IM	impact event
JORC	Joint Ore Reserves Committee
KG	kaolinised granite
MAOP	maximum allowable operating pressure
MC	Mineral Claim 4510
Mining Act	Mining Act 1971 (SA)
ML	Mining Lease
MP	Mining Proposal
MPL	Miscellaneous Purposes Licence
Mining Regulations	Mining Regulations 2020 (SA)

Acronym	Expansion
NAF	non-acid forming soils
NVHA	native vegetation heritage agreement
Noise EPP	Environment Protection (Noise) Policy 2007
PAF	potential acid forming soils
PEPR	Program for Environment Protection and Rehabilitation
PIM	potential impact event
PMST	Protected Matters Search Tool
Project / Proposed Development	The Great White Kaolin Project on the Eyre Peninsula
PWA	prescribed wells area
PWRA	prescribed water resources area
RCS	Respirable Crystalline Silica
ROM	run-of-mine
SA	South Australia
SEB	Significant Environmental Benefit
Si	silica
SO_2	sulfur dioxide
SPR	source, pathway and receptor
TOR006	Terms of Reference 006 for Mineral Lease/ Miscellaneous Purposes Licence Applications, published by the Department for Energy and Mining
TPS	total potential sulfidic acidity
UC	uncertain acid forming potential
WQ EPP	Environment Protection (Water Quality) Policy 2015

5 References

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Sneddon (1981) *The Effects of Seismic Blasting on Water Wells*. Thesis submitted to the University of Alberta, Canada.

6 Appendices and Supporting Documents

The following appendices are supplied with this response document:

Appendix A	SA Water Response Document
Appendix B	Potential Impact of Dust on Crops and Stock
Appendix C	Topographical and Visual Amenity Receptor Location
Appendix D	Updated Site Layout and Mine Design
Appendix E	Noise Baseline Report
Appendix F	Updated Equivalent Annual CO_2 Calculations
Appendix G	Acid and Metalliferous Drainage Assessment
Appendix H	Additional Groundwater Information And Sensitivity Analysis

APPENDIX A – SA WATER RESPONSE DOCMENT

2nd July 2021

Mr Joe Ranford
Executive Operations Director
Andromeda Metals

Dear Mr Ranford,

Great White Kaolin Project Andromeda Metals – Progress Update

SA Water has been working with Andromeda Metals on the water supply elements involved in developing the Great White Kaolin mine at Poochera on the Eyre Peninsula.

Your requirements are for a reliable water supply of up to 10 litres/second and approximately 860 kilolitres/day (315 ML/pa), at Chandada on the Eyre Peninsula.

One of SA Water's underpinning strategies is to drive customer outcomes through safe, smart, reliable and affordable services. In achieving this outcome one of the key tenets governing SA Water when undertaking network augmentation is for existing customer supplies not to be negatively impacted by any third-party project or works or connection of new customers.

To date, SA Water has carried out a high-level investigation of the water supply requirements and considered several supply options that can provide the required service to Andromeda, whilst at the same time avoiding impact to SA Water's existing customers. SA Water has worked closely with Andromeda to ensure that your requirements and those of our existing customers are well understood and can be supported.

Whilst a final technical solution is still being developed by SA Water and Andromeda, using modelling based on summer (high demand) scenarios, some key design elements have been identified, including:

- Increasing the size of approximately 4.2 km of water main to be duplicated from Poochera, to provide additional supply capacity to Streaky Bay and other SA Water customers.
- Establishment of booster pumping capability along Poochera to Streaky Bay water main.

SA Water is willing to instal data loggers at key points in the network to supplement our modelling to provide additional information in the design stage.

Once construction is completed, SA Water will test the performance of the water supply system during the commissioning stage to check that it operates as designed.

SA Water is committed to continuing to work with Andromeda to achieve a solution that balances the needs of both Andromeda and SA Water's existing customers.

Yours sincerely

Matt Minagall
Senior Manager Customer Growth

APPENDIX B – POTENTIAL IMPACTS OF DUST ON CROPS AND STOCK

Contents

List of Tables

1 Introduction

This attachment provides a response to questions raised during the public consultation process regarding the potential impacts of dust generated during the construction, operation, and closure of the Proposed Development. The specific questions raised are outlined in Table 1-1 below.

Table 1: Questions and concerns raised in relation to potential impacts of dust on crops and stock

Concerns/ Questions Asked/ Further Information Requested	Name and Submission ID#
We feel the dust and noise studies haven't come to any substance to give us clarity of what it will be like to live close to this mine. This includes dust collecting on our roof/gutters, dust affecting adjoining paddocks including crops and stock.	**Submission ID 8.1 and 8.2, M. Carey via DCSB**
Has any assessment been done regarding the potential contamination of grain due to dust associated with the mine?	**Submission ID 20.1, Paul Lynch**
As one of the immediate land owners, we have continually expressed concern to Andromeda about the impact of dust from the mine on crops and pasture that will closely border the proposed mine site and road network. Can Andromeda clarify what these impacts will be? Quality Assurance is a big part of agriculture with livestock (meat & wool) and grain becoming highly regulated.	**Submission ID 66.1 a), Carey Brothers Family Trust**
Our sheep feedlot is located within 400 m of the proposed mine. What measures will Andromeda implement to ensure the health and safety of our livestock in regard to dust, noise, especially blasting, to eliminate the impact on our feedlot?	**Submission ID 66.1 b), Carey Brothers Family Trust**
Our family business relies on all the land it farms to be able to make a profit. Losing 270 ha of both cropping and grazing land will affect our viability going forward especially when we don't know the impacts of dust on land adjoining the proposed development.	**Submission ID 83.1, Carey Brothers Family Trust**
As an adjoining landholder who will be immediately impacted by any increasing in dust, especially being the neighbour on the southern boundary to the site, we are very concerned about the lack of detail in the applicant's commitment to dust mitigation. We are concerned about the negative impacts dust may have on our grazing stock and cropping program, which is immeasurable until we actually experience farming next to a mine.	**Submission ID 164.1 e), Shaun and Patrea Carey**

As part of the Company's requirements to understand the potential impacts of the Proposed Development on the environment a study into potential dust generation and exposure levels was undertaken by Northstar Pty Ltd for the Mining Proposal. Whilst it is likely that the Proposed Development will generate dust, its contribution is estimated be less than 1% of the total predicted TSP concentration at nearby receptors, as compared to existing background sources which makes up 99% of the predicted TSP concentration.

2 Description of the Proposed Development

The Proposed Development will consist of a Mining Lease (ML), an access road Miscellaneous Purposes Licence (MPL) and a water pipeline MPL. The ML application is for the development of a shallow open pit mine, wet processing plant and supporting infrastructure such as an overburden stockpile, soil stockpiles, ore and product stockpiles. The operation will be developed in two stages:

- Stage One – up to 600,000 dry tonnes per annum of direct shipping ore (DSO) mined for toll treatment overseas
- Stage Two – 500,000 tonnes of ore processed into 250,000 tonnes per annum of extruded dried kaolin product.

The construction of the ML will involve the stripping of topsoil and overburden, and preparation of the site to extract and transport kaolin ore offsite during Stage One operations.

During Stage Two, the operation will mine and process ore supplied from an open pit which will be up to ~40 m in depth with mining proposed to be undertaken using conventional open pit mining equipment. Overburden will be stockpiled initially and when possible, placed into the previously mined pit. Washed sand will be the by-product from the recovery of the kaolin, with no tailings produced by the operation. This sand will be returned to the pit as part of progressive mine rehabilitation works. Ore from the mine will be processed using mixers, screens, hydrocyclones, attrition scrubbers, thickeners and filter presses, before being dried. Once dried the kaolin noodles will be packed into flexible intermediate bulk containers (i.e., 'bulka bags') and transported by truck, through Poochera, to the selected port facility.

2.1 Dust emission sources and activities

The Company recognises that the Proposed Development has the potential to generate dust, as the surrounding area currently experiences significant dust events under extreme conditions. The Company will implement active dust control measures to manage the likelihood of dust generation. We understand that the community is concerned about additional dust generation and the first step to control is identifying sources of dust. Potential dust emission sources associated with the construction, operation, and closure phases of the Proposed Development were identified in the Application dated February 2021and are repeated below.

- Land clearance of land of vegetation, topsoil and any overburden, silcrete and calcrete (including blasting).
- Haulage of materials to stockpiles (including soil, overburden, calcrete and silcrete).
- Extraction of up to 600 000 tpa of ore (kaolin and other materials).
- Loading of kaolin and other materials to road trucks for haulage offsite and transfer to port.

- Materials handling.
- Development of site services and structures, including access roads, pads for the construction of onsite plant, processing areas and services buildings.
- Crushing of extracted silcrete and calcrete for use in road upgrade of the access road, from the Poochera-Port Kenny Road to the ML.
- Construction of on-site plant, processing areas and services building.
- Installation of the water pipeline including trench excavation, placement of the pipeline and covering the trench.
- Backfilling the mine pit.
- Decommissioning of supporting infrastructure i.e. office buildings during rehabilitation of the ML.

The dust emissions expected during construction, operation and closure fall into two main categories of physical dust particulates:

- Fugitive dust
- Dust produced as a part of mining operations (point source emissions).

Fugitive dust is not discharged to the atmosphere in a confined flow stream but, rather, is produced as a result of mechanical disturbance of granular material exposed to the air. Fugitive dust sources and activities may include soil stockpiles, haulage of soil material to stockpiles, haulage of kaolin and other materials to the processing plant, and road traffic.

Physical dust particles produced as part of the mining operations (point source emissions) may include dust generated as a result of land disturbance and clearance, trench excavation for the water pipeline and extraction and processing of kaolin ore. The potential impacts and proposed control and management strategies of this dust are discussed in detail in Chapter 12 of the MLP.

3 Reponses to public consultation

The Company acknowledges that during community engagement, one of the key issues identified by stakeholders was the potential impact of dust as result of activities relating to the Proposed Development. A number of submissions received during the public consultation period (Table 1-1) echoed this local community concern, specifically surrounding the potential impact of dust on crops and livestock. Sections 3.1 and 3.2 below respond to these concerns in detail.

3.1 Potential impact of dust on crops

As discussed in Section 2.1, dust emissions expected as part of the construction, operation and closure of the Proposed Development are physical dust particulates. Unlike dust containing exogenous chemical compounds, physical dust particulates may create nuisance and amenity impacts. The dust generated from the Proposed

Development does not contain any reactive chemicals containing hazards such as exogenous chemicals.

The Company will comply with the applicable legislative and adopted industry standards relating to dust. The expanded standards for dust are, as shown in Table 12-5 of the MP and below in Table 2. These standards are applicable to all businesses and industries.

Table 2: AQ EPP ground level concentrations

Pollutant	Classification	Averaging time	Unit	Maximum concentration ($mg \cdot m^{-3}$)	Source
Nitrogen dioxide (NO_2)	Toxicity	1 hour	$mg \cdot m^{-3}$	0.25	Environment Protection (Air Quality) Policy 2016
		12 months	$mg \cdot m^{-3}$	0.06	Environment Protection (Air Quality) Policy 2016
Particles (as PM_{10})	Toxicity; Group 1 carcinogen	24 hours	$mg \cdot m^{-3}$	0.05	Environment Protection (Air Quality) Policy 2016
Particles (as $PM_{2.5}$)	Toxicity; Group 1 carcinogen	24 hours	$mg \cdot m^{-3}$	0.025	Environment Protection (Air Quality) Policy 2016
		12 months	$mg \cdot m^{-3}$	0.008	Environment Protection (Air Quality) Policy 2016
Respirable crystalline silica (RCS)	Toxicity; Group 1 carcinogen (IARC)	3 minutes	$mg \cdot m^{-3}$	0.00036	Environment Protection (Air Quality) Policy 2016
Particulates (as total suspended particulate [TSP])		1 year	µg·m-3	90	Approved Methods for the Modelling and Assessment of Air Quality in NSW'
Deposited dust		1 year	g m-2·month-1(b)	2	Approved Methods for the Modelling and Assessment of Air Quality in NSW' (Assessed as insoluble solids as defined by AS 3580.10.1)
			g m-2·month-1(c)	4	

Notes: (a): micrograms per cubic metre of air
(b): Maximum increase in deposited dust level
(c): Maximum total deposited dust level

The levels of concentration shown in Table 2 have been proven to have no impact on crop production have been either legislated or adopted by EPA agencies around Australia for the purposes of dust management. The Company has also developed dust control and management strategies (Chapter 12 of the MLP) that are expected to reduce dust impact events as much as possible and to as low as reasonably practicable.

In the case of the Great White Deposit, the topsoil and overburden that is proposed to be disturbed during the life of mine, are inert and produce the same type of dust that is produced by farming activities in the region. The kaolin dust that is expected to be produced by the mining operation is also inert given that kaolin is a non-toxic aluminosilicate clay mineral. The potential impact of dust particulates, and kaolin dust, on crops has been researched extensively. The potential impact of road dust on soybean physiology and production was investigated by Gnoinsky et al. (2019). As part of the study, dust was applied weekly to soybean foliage at designated rates of 0, 15.8, 78.8, 158 g m^{-2}, in 2015, and 0, 15.8, 78.8, 158,2 × 158, and 315 g m^{-2} in 2016. The 2 × 158 g m^{-2} treatment was 158 g m^{-2} applied twice per week (Gnoinsky et al. 2019). Changes to the soybeans' leaf temperature, chlorophyl content, seed quality and yield were monitored with the study finding no significant differences in leaf temperature, yield, yield components, and seed composition in each year. This indicated that the weekly and bi-weekly applications of dust at high rates had little to no impact on soybean production and seed quality likely owing to the inert nature of the dust soybean resilience to dust coverage. Similarly, research conducted by Al-Hazmi (2000) examining the effect of soil dusting on grapevines indicated no statistical difference in photosynthetic rates where dusting with soil was applied as a form of organic fungicide.

Specific research on the impact of kaolin dust on plants has also found that, once applied to plant foliage, kaolin dust has little to no negative impact on plant productivity. Kaolin dust spraying was found to have positive agricultural benefits through the prevention of pests and disease in food crops, and increased drought tolerance/improved transpiration resistance in wheat, citrus, and grapes as a result of the white reflective nature of the clay (Abdallah, El-Bassiouny and AbouSeeda 2019; De Smedt, Steppe and Spanoghe, 2017; Moreshet, Stanhill and Fuchs 1977). Abdallah, El-Bassiouny and AbouSeeda 's (2019) study explored the potential impact of kaolin dust on the wheat specifically and found that the kaolin dust spraying resulted in improved nutritional values of grain yield of wheat and led to an increase in growth parameters. The work recommended that kaolin may significantly improve plant physiology consequently leading to higher yield production.

Whilst there are potential dust impact events to agriculture as a result of the construction, operation and closure of the Proposed Development, the negative impacts are expected to be minimal considering that the Company's contribution of dust is in the order of 0.1 g m^{-2}·$month^{-1}$ (2.5% of the proposed criterion). Further, the Company's contribution of dust will be managed by the control and management strategies detailed in Chapter 12 of the MLP, reducing the potential impacts to as low as reasonably practicable.

Andromeda will be required to comply with all air quality conditions specified in the ML (if granted) and specific air quality criteria developed in a Program for Environment Protection and Rehabilitation (PEPR). These criteria must be met or the Company will run the risk of its mining operations being non-compliant and penalised under "Part 10B – Compliance and Enforcement" of the Mining Act 1971.

A Dust Management Plan (DMP) and Trigger Action Response Plan (TARP) will be prepared during the development of the PEPR. The purpose of a TARP is to provide the processes to identify conditions that may lead to dust impacts and to provide actions to avoid these impacts. It is likely the TARP will include air quality trigger values, meteorological trigger values, and visual observation trigger values. With the above measures in place, physical dust particulate emissions are expected to be minimal with any residual emissions being negligible and unlikely to result in negative impacts surrounding crops.

3.2 Potential impact of dust on livestock

Independent modelling has predicted that the Proposed Development will result in limited increase to dust emission, as compared to what receptors are currently experiencing.

To summarise:

The predicted annual average particulate matter concentrations resulting from the **construction** of the Proposed Development is presented in Table 12-9 and Table 12-10:

- Annual average TSP concentrations are predicted to be 35 % of the proposed criterion of 90 $\mu g \cdot m^{-3}$. Contribution from the Proposed Development is less than 1 %, compared to existing background sources.
- Annual average $PM_{2.5}$ concentrations are predicted to be 92 % of the proposed criterion of 8 $\mu g \cdot m^{-3}$; however, contribution from the Proposed Development is less than 1.5 % of the cumulative total.
- Annual Average Dust Deposition are predicted to be approximately 50 % of the proposed criterion of 4 $g \cdot m^{-2} \cdot month^{-1}$, where the Proposed Development contributes less than 0.1 $g \cdot m^{-2} \cdot month^{-1}$ (2.5 % of the proposed criterion).
- Maximum 24-hour average PM_{10} concentrations are predicted to be between 49 % and 60 % of the proposed criterion of 50 $\mu g \cdot m^{-3}$. Contribution from the Proposed Development ranges between 0.7 and 6.2 $\mu g \cdot m^{-3}$ (up to 12.4 % of the proposed criterion).
- Maximum 24-hour $PM_{2.5}$ concentrations are predicted to be less than half of the proposed criterion of 25 $\mu g\ m^{-3}$, ranging between 10.6 and 11.8 $\mu g\ m^{-3}$. Contribution from the Proposed Development is expected to be less than 1.5 $\mu g\ m^{-3}$ (that is, less than 6% of the proposed criterion).
- 3-minute average silica concentrations are predicted to be very low, with a maximum concentration expected to be less than 1.5% of the air quality guideline of 0.00036 mg m^{-3} published in the Environment Protection (Air Quality) Policy 2016.
    - It is noted that these incremental and cumulative concentrations assume that all of the material to be handled at the Proposed Development site would contain 2% crystalline silica. Review of the emissions inventories indicate that <10% of material handled would be silcrete and therefore the results presented above are likely to be of the order of 10 times lower.

- There are no NO_2 concentrations predicted to occur at any of the identified residential receptors throughout construction, as nitrous oxides are only appliable to the gas fuelled electricity production operating as part of Stage Two.

The predicted annual average particulate matter concentrations resulting from the **operation** of Stage One of the Proposed Development is presented in Table 12-11 and Table 12-12:

- Annual average TSP concentrations are predicted to be up to 38% of the proposed criterion of 90 $\mu g \cdot m^{-3}$. Contribution from the Proposed Development is less than 1% of the total predicted concentration, as compared to existing background sources which makes up 99% of the predicted concentration.
- Annual average $PM_{2.5}$ concentrations are predicted to be 88% of the proposed criterion of 8 $\mu g \cdot m^{-3}$, however, contribution from the Proposed Development is less than 1.5% of the cumulative total.
- Annual Average Dust Deposition are predicted to remain approximately 50% of the proposed criterion of 4 $g \cdot m^{-2} \cdot month^{-1}$ (same as construction), where the Proposed Development contributes less than 0.1 $g \cdot m^{-2} \cdot month^{-1}$ (2.5% of the proposed criterion).
- Maximum 24-hour average PM_{10} concentrations are predicted to be between 52% and 87% of the proposed criterion of 50 $\mu g \cdot m^{-3}$. Contribution from the Proposed Development ranges between 2.2 $\mu g \cdot m^{-3}$ at the furthest receptor (R11), up to 19.8 $\mu g \cdot m^{-3}$ at the closest receptor (~40% of the proposed criterion) as shown in Figure 12-4.
- Maximum 24-hour $PM_{2.5}$ concentrations are predicted to be up to 52.8% of the proposed criterion of 25 $\mu g \cdot m^{-3}$, ranging between 10.7 and 13.2 $\mu g \cdot m^{-3}$. Contribution from the Proposed Development is expected to be less than 3 $\mu g \cdot m^{-3}$ (that is, less than 12% of the proposed criterion).
- 3-minute average silica concentrations are predicted to be up to 53.3% of the air quality guideline of 0.00036 $mg \cdot m^{-3}$ published in the Environment Protection (Air Quality) Policy 2016. With no background sources, the entire contribution is from the Proposed Development.
    - Maximum 3-minute silica concentrations are predicted to be a maximum of 53.3% of the relevant criterion at all surrounding receptor locations during Stage One operations. It is noted that these incremental and cumulative concentrations assume that all of the material to be handled at the Proposed Development site would contain 2% crystalline silica. Review of the emissions inventories indicate that <10% of material handled would be silcrete and therefore the results presented above are likely to be of the order of 10 times lower, and therefore a maximum of 5.4% of the criterion.
- There are no NO_2 concentrations predicted to occur at any of the identified residential receptors throughout Stage One, as nitrous oxides are only appliable to the gas fuelled electricity production operating as part of Stage Two.

Given the low contribution of the Proposed Development to the existing air environment, it is not expected to result in a greater impact to livestock or woolclip than is currently experienced. Further, control strategies have been developed to reduce any potential dust impacts to as low as reasonably practicable, and the Proposed Development of a DMP and TARP, potential dust impacts to woolclip and livestock meat are expected to be minimal to negligible.

4 Conclusion

There are existing dust events that are experienced by the community created as a result of weather and surrounding vegetation conditions. The Proposed Development is expected to have a minor (~1% increase in deposition levels) impact to the existing dust levels. With the implementation of design and operational management measures, and the proposed development of a DMP and TARP as a part of the PEPR, all potential dust impacts to crops and stock are expected to be as low as reasonably practicable and well within the appropriate legislative and industry standard air quality criteria.

5 References

Abdallah, M. M. S., El-Bassiouny, H. M. S. and AbouSeeda, M. A. (2019) *Potential role of kaolin or potassium sulfate as anti-transpirant on improving physiological, biochemical aspects and yield of wheat plants under different watering regimes*, Bulletin of the National Research Centre, 43(134).

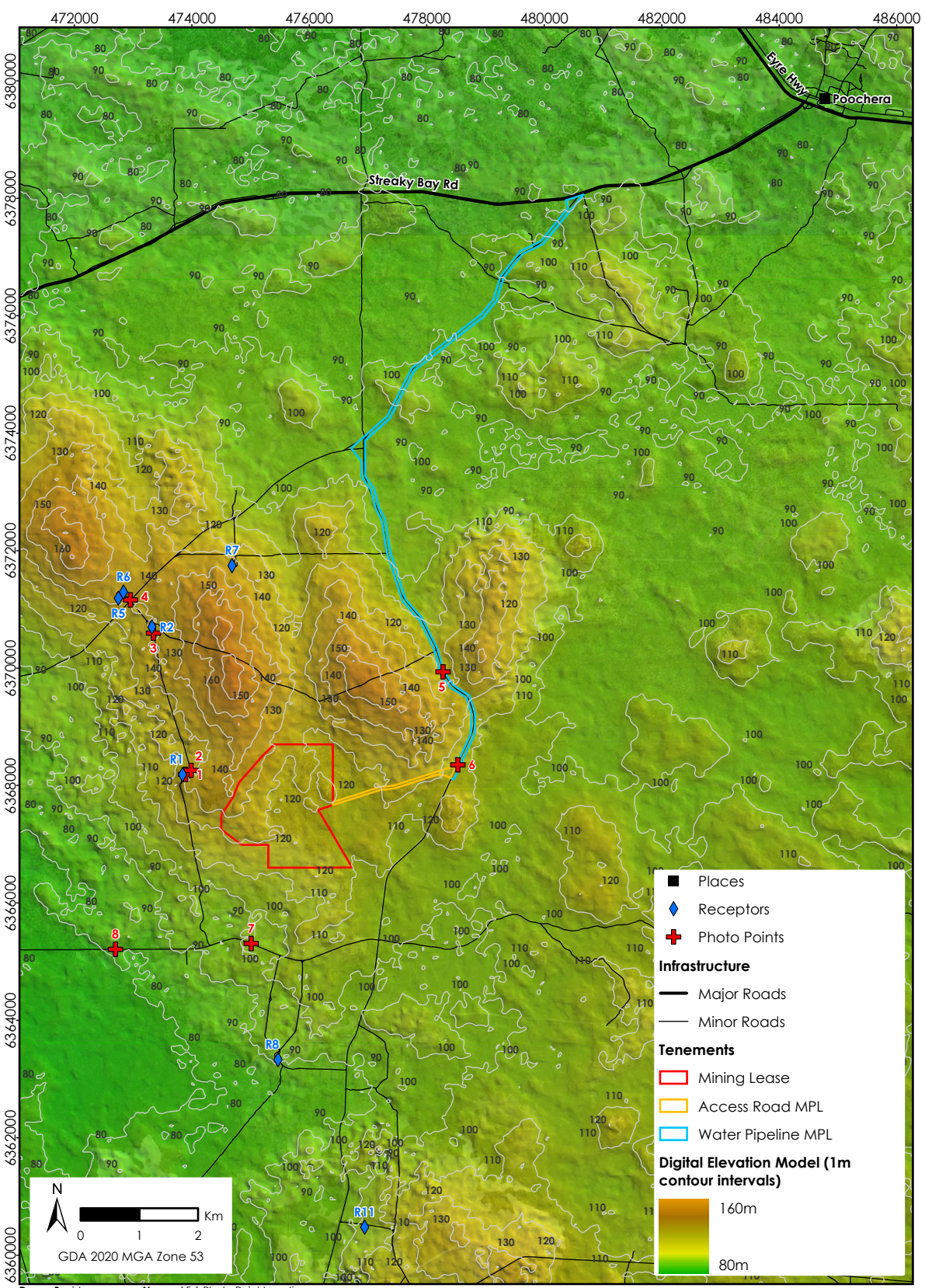
AL-Hazmi, M. H. (2000) *Effects of Dusting Grapevines with Soil Dust on Grapevine Photosynthesis Productivity*, Journal of Science and Technology, 5(1).

De Smedt, C., Steppe, K. and Spanoghe, P. (2017) *Beneficial effects of zeolites on plant photosynthesis*, *Advanced Materials Science* 2(1).

Moreshet, S., Stanhill, G. and Fuchs, M. (1977) *Effect of Increasing Foliage Reflectance on the CO2 Uptake and Transpiration Resistance of a Grain Sorghum Crop*, Agronomy Journal, 69(March-April).

Gnoinsky, A., Hargiss, C. L. M., Prischmann-Voldseth, D. and DeSutter, T. (2019) '*Road Dust Fails to Impact Soybean Physiology and Production*', Crop Ecology and Physiology, 111(4), pp. 1760-1769.

APPENDIX C – TOPOGRAPHICAL AND VISUAL AMMENTIY RECEPTOR LOCATON



Drawn By: jstrauss **Name:** 15-1 Photo Point Locations

APPENDIX D – UPDATED SITE LAYOUT AND MINE DESIGN

List of Figures

Plan view during mining of showing location of sections A-A and B-B with processing plant, in pit overburden storage, ML and operating pit.

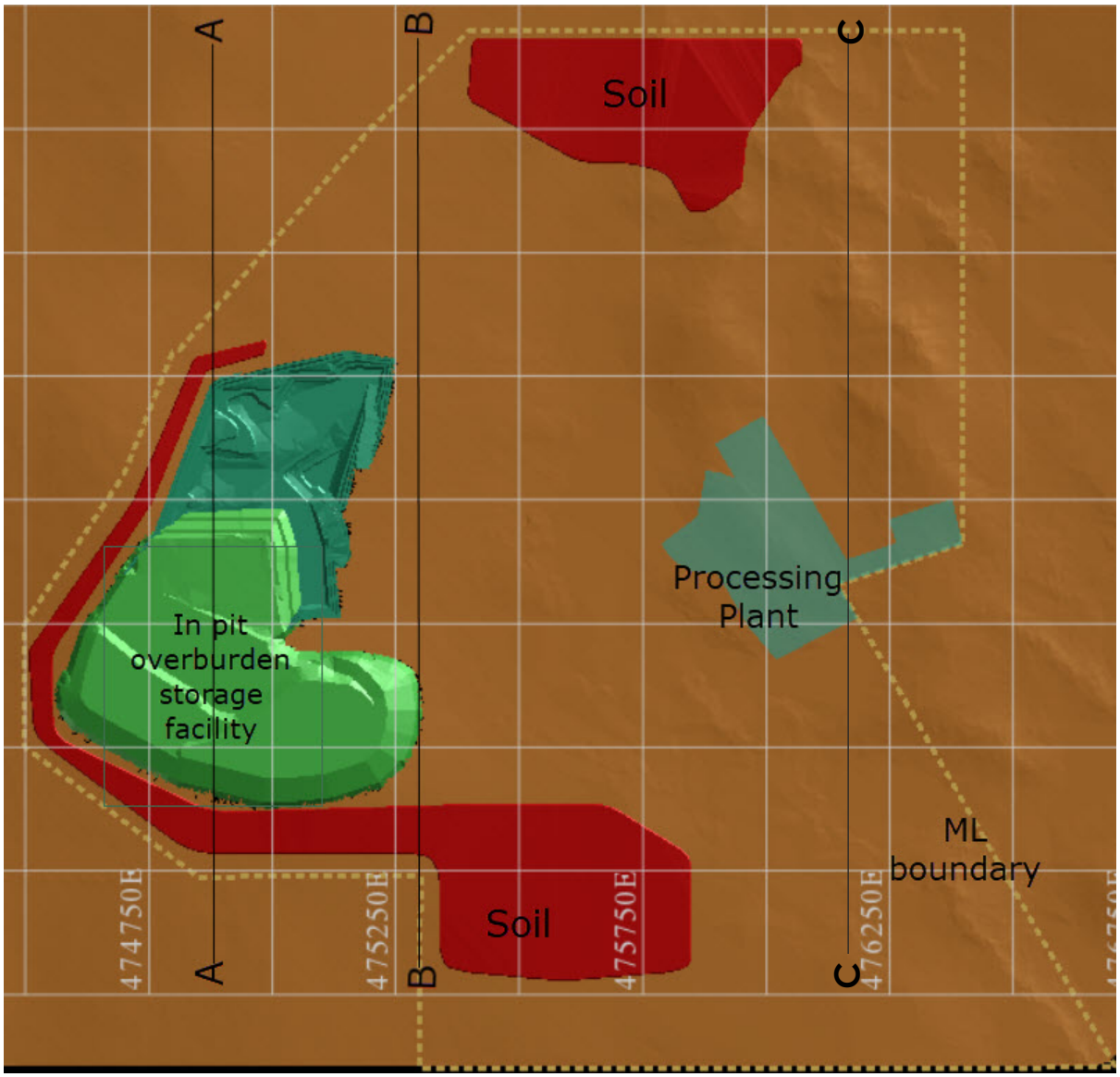


Figure 1: Plan view during mining

Plan view after mining completed showing location of section C-C with processing plant and backfilled pit with inpit dump battered down to stable and safe slope.

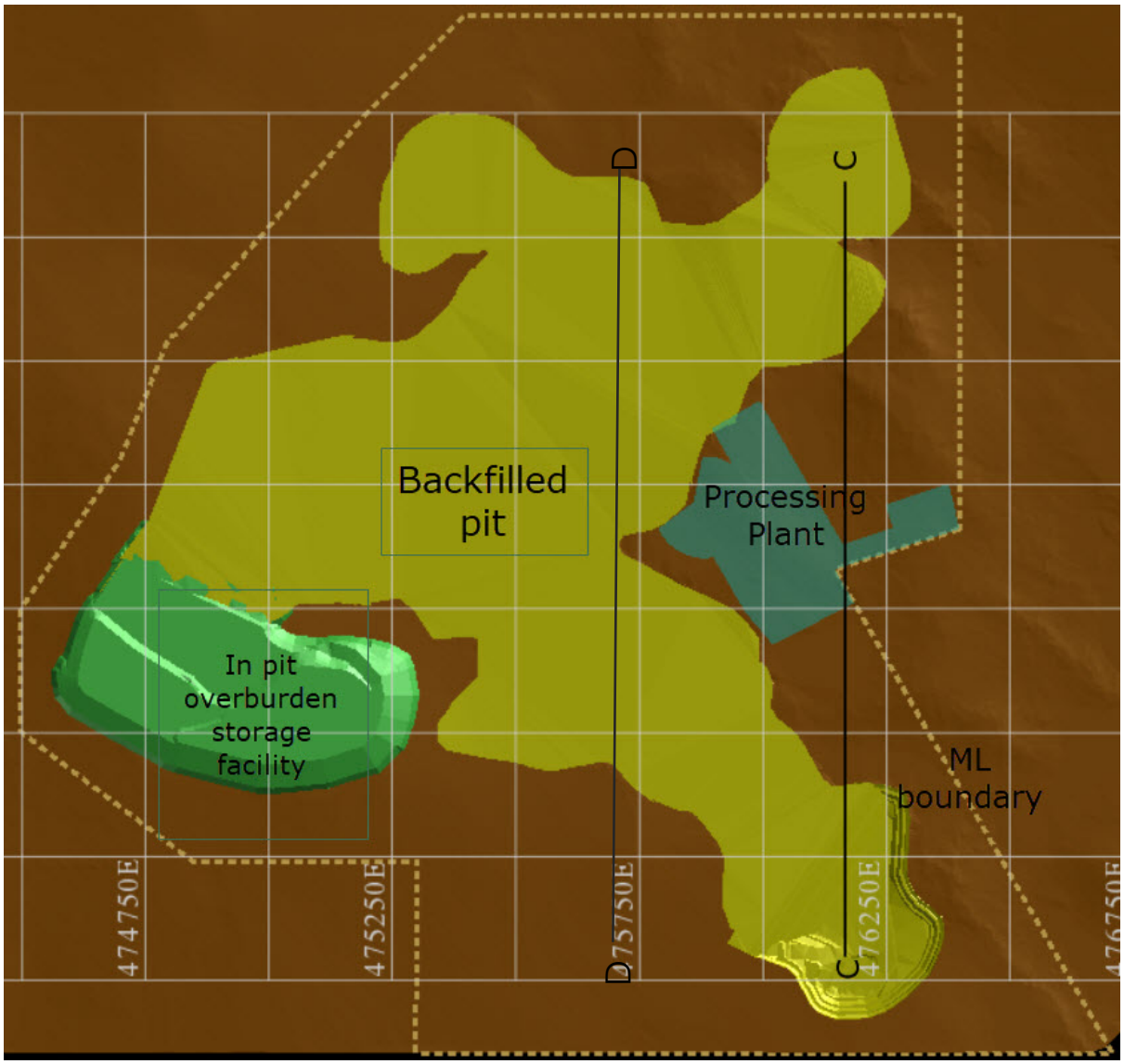


Figure 2: Plan view after mining

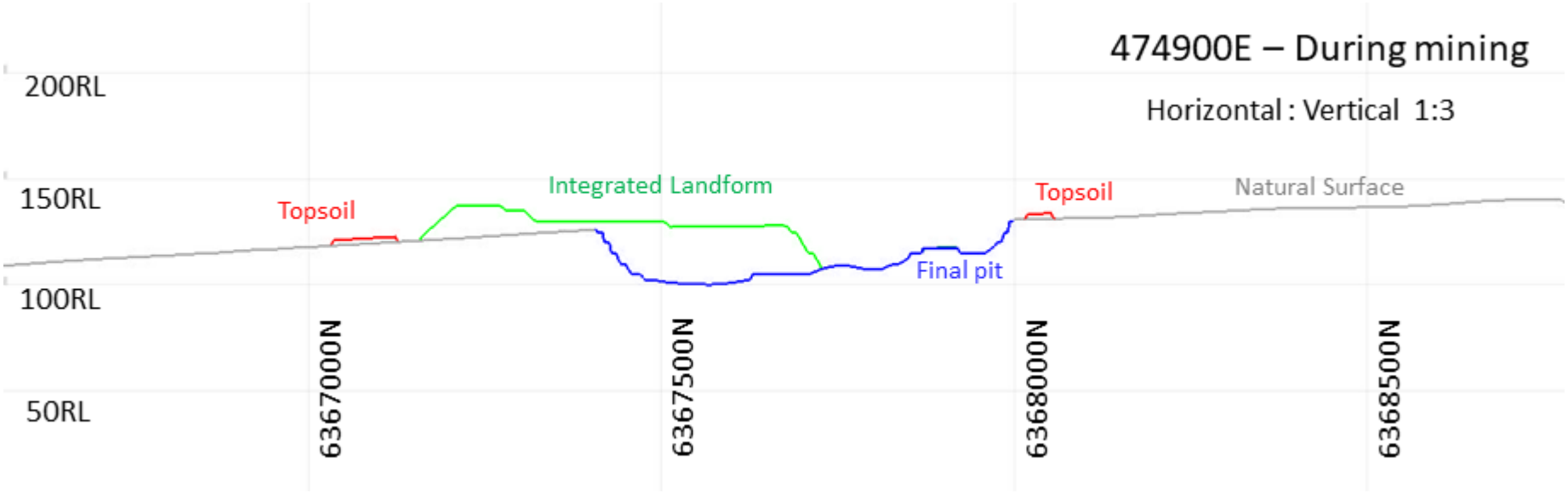


Figure 3: Section 474900 East during mining A-A

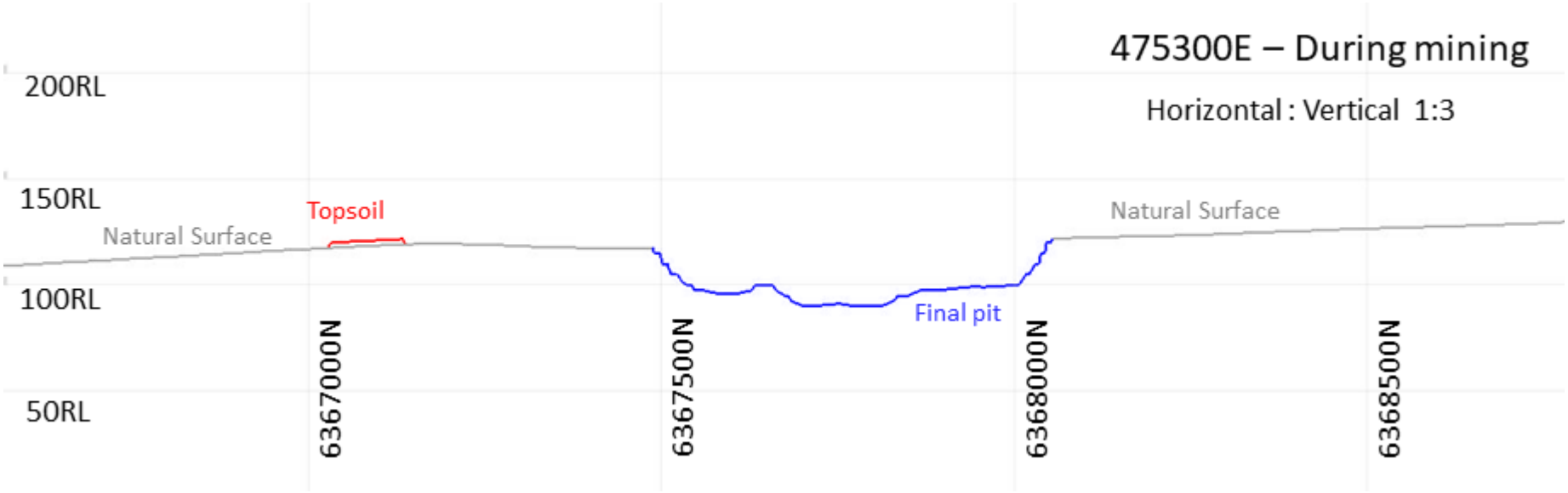


Figure 4: Section 475300 East during mining B-B

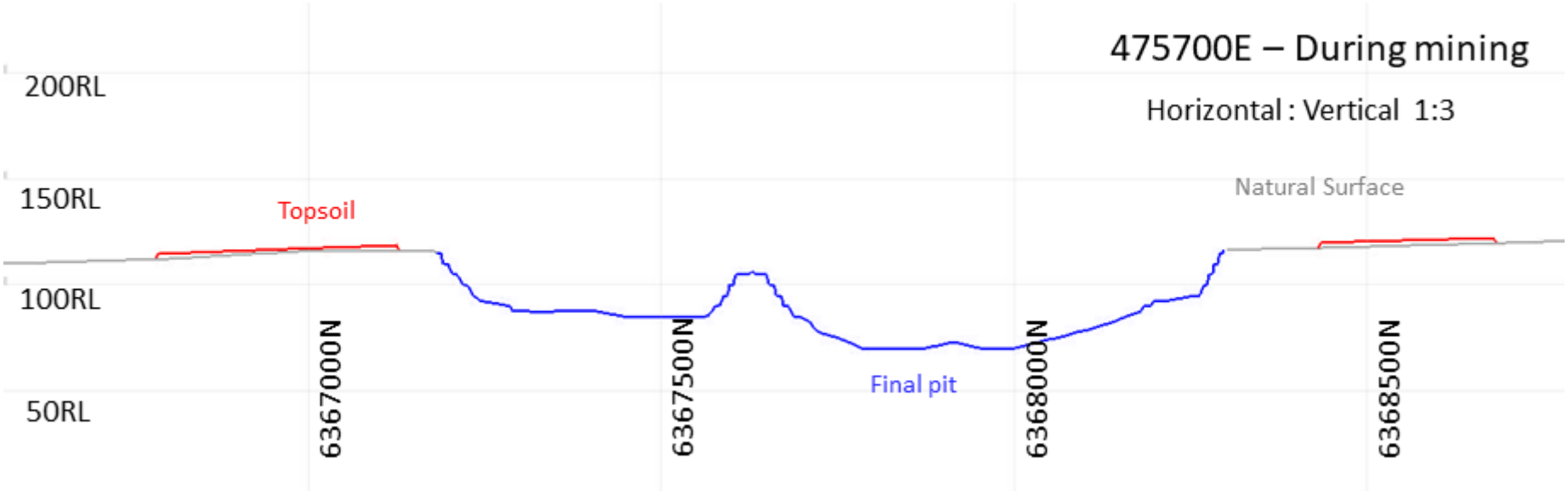


Figure 5: Section 475700 East during mining C-C

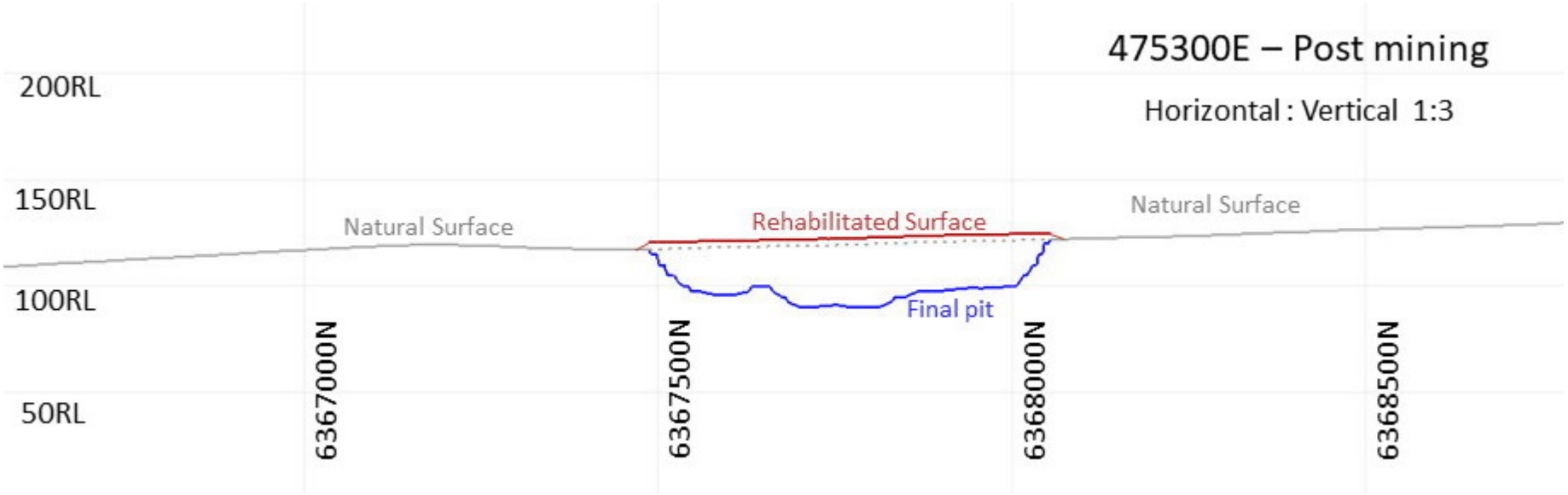


Figure 6: Section 475300 East post mining B-B

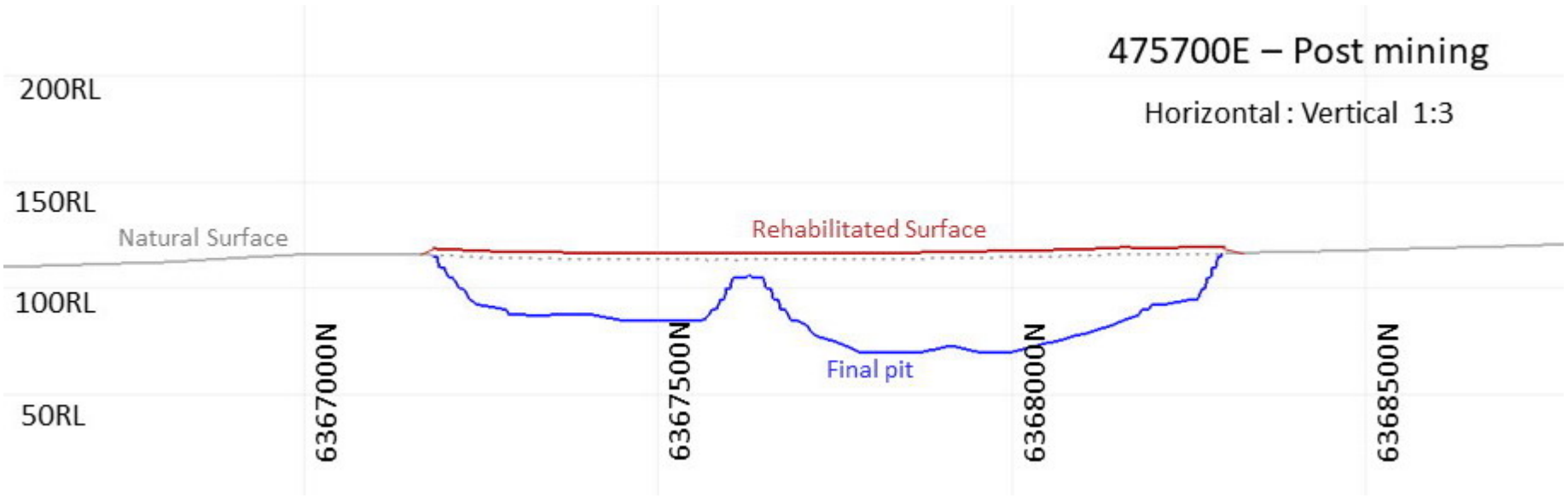


Figure 7: Section 475700 East post mining D-D

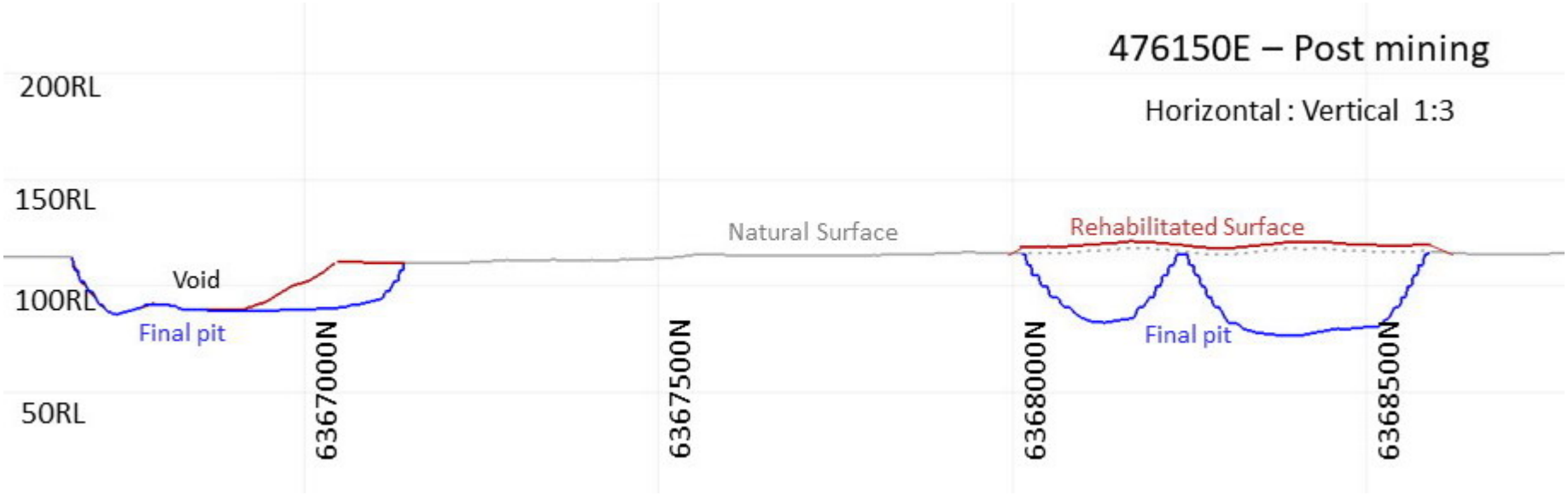


Figure 8: Section 476150 East post mining C-C

APPENDIX E – NOISE BASELINE REPORT

Friday, 2 July 2021

Project number: A190932
Reference: A190932LT3

Darren Klingner
Andromeda Metals Ltd
Level 1, 5-7 King William Road
Unley SA 5061

Dear Darren,

Poochera Kaolin Project
Background Noise Monitoring

1 Introduction

Background noise monitoring was conducted at locations in the vicinity of the Great White Kaolin Project near Poochera, South Australia. Noise logging was conducted at 3 locations during the period 17 June – 24 June 2021.

2 Methodology

Figure 1 shows the location of the site along with the unattended logger locations. Table 1 provides descriptions of the locations.

Table 1 Summary of logging locations

ID	Address	Notes
Noise1	Tootla Road, Inkster	Within the road reserve along Tootla Road. Location is between the project site and nearest noise sensitive receiver to the south.
Noise2	288A Parla Peak Road, Chandada	5 m from dwelling (free field)
Noise3	288B Parla Peak Road, Chandada	10 m from dwelling (free field)

All sound level measurement instrumentation used for the purposes of this assessment are classified as either a Class 1 or Class 2 measurement device, as described in Australian Standard AS IEC 61672.1—2004. Acoustic calibration was conducted before and after the logging period and no significant calibration drift was observed. Each sound level meter unit holds current calibration certification by an independent NATA certified laboratory. Copies of the certificates are available on request.

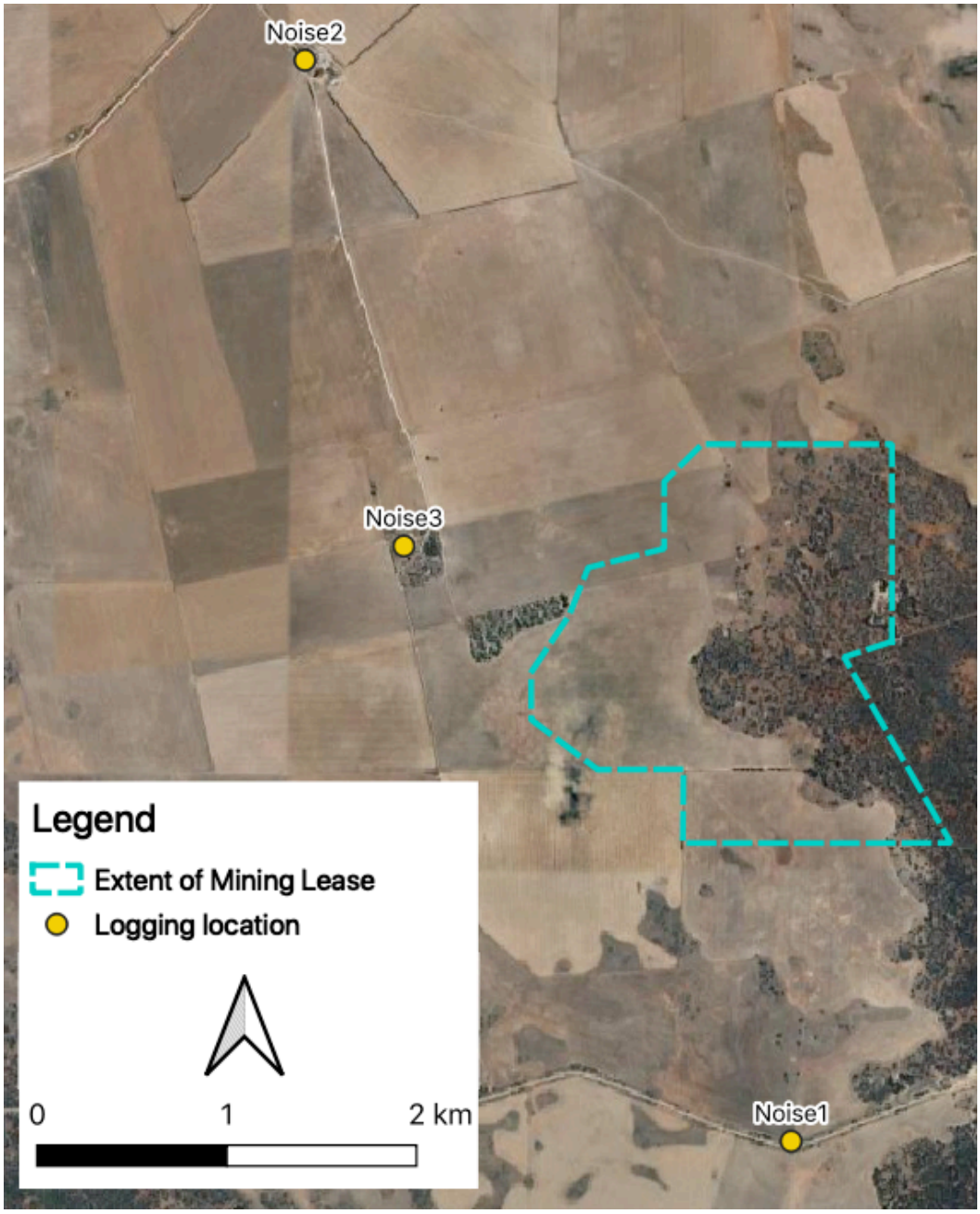


Figure 1 Noise logging locations

Noise measurements were undertaken in accordance with the following:

- The microphone of the sound level meter was at a height of approximately 1.2 metres above the ground and at least 3.5 metres away from any wall or facade.
- The axis of maximum sensitivity of the microphone of the sound level meter was directed towards the noise source.
- A wind shield was used during all measurements.
- Care was taken to avoid any effect on the measurement of extraneous noise, acoustic vibration or electrical interference.

We note that measurement results were affected by high wind speeds and rainfall for significant periods of the monitoring duration. Noise data for periods when wind speeds exceeded 5 m/s and rainfall above 0.2 mm/hr (based on Minnipa RS BOM data) have been excluded from the summary of results in accordance with *Environment Protection (Noise) Policy 2007*. The remaining period of Friday 18 June – Sunday 21 June which were not adversely affected by weather are considered sufficient to characterise the background noise environment in this location.

During some periods, the measured noise level was equal to the instrumentation noise floor of approximately 14 dB(A), particularly at Tootla Road during evening and night time periods. Actual noise levels may be lower than the instrument noise floor.

Noise sources present at the time of logger deployment included vehicle traffic on both Tootla and Parla Peak Roads. Dog barking and the operation of light farm machinery was also observed at 288A Parla Peak Road (Noise2).

3 Results

Noise monitoring results are presented in Tables 2 and 3 below, and appended daily noise level plots for each location.

Table 2 Noise monitoring results summary - Day

Location	Type/SN	Date period	Average measured noise level, dB(A)		
			L_{eq}	L_{90}	L_{max}
Noise1	NL-42 01000321	18/06/21 – 21/06/21	38	19	74
Noise2	NL-42 01000320	18/06/21 – 21/06/21	46	28	88
Noise3	NL-42 01000323	18/06/21 – 21/06/21	41	29	83

Table 3 Noise monitoring results summary - Night

Location	Type/SN	Date period	Average measured noise level, dB(A)		
			L_{eq}	L_{90}	L_{max}
Noise1	NL-42 01000321	18/06/21 – 21/06/21	23	15	69
Noise2	NL-42 01000320	18/06/21 – 21/06/21	34	27	68
Noise3	NL-42 01000323	18/06/21 – 21/06/21	33	28	75

The results presented in Table 2 and Table 3 are consistent with the description of the existing noise environment in the Mining Proposal as ‘quiet’ and typical of a remote rural location.

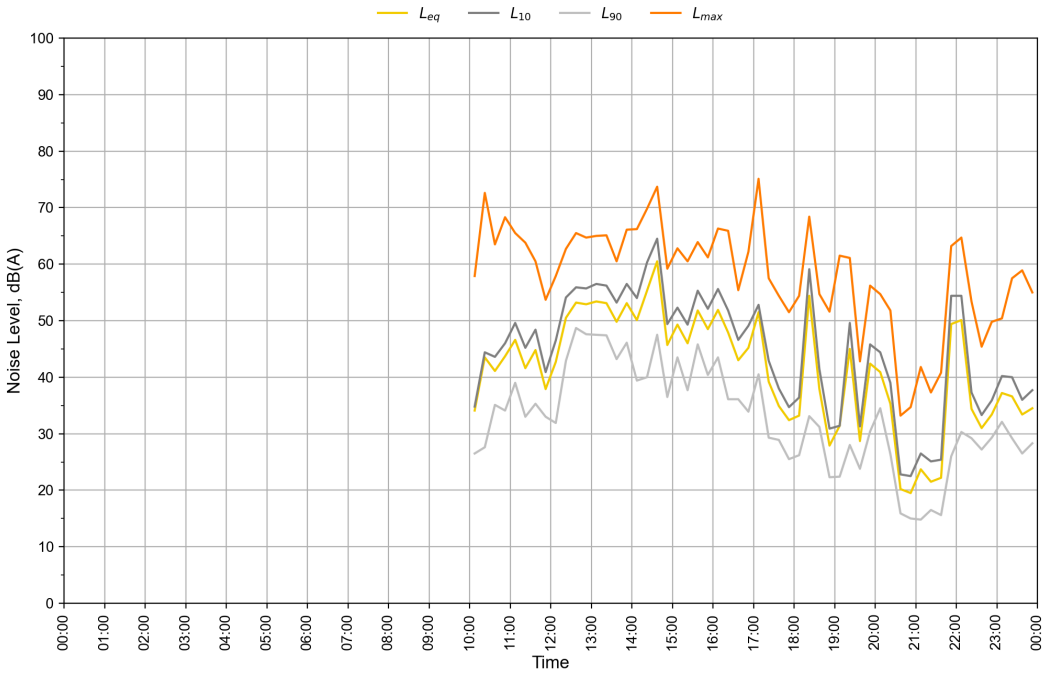
Please let me know if you have any queries or wish to discuss the above.

Yours sincerely,

Nick Henrys
Senior Acoustic Consultant
p+61 8 8155 5888
m+61 481 882 689
nick.henrys@resonate-consultants.com

Resonate

Noise1 - Tootla Road - Thursday, 17 June 2021



Rion NL-42
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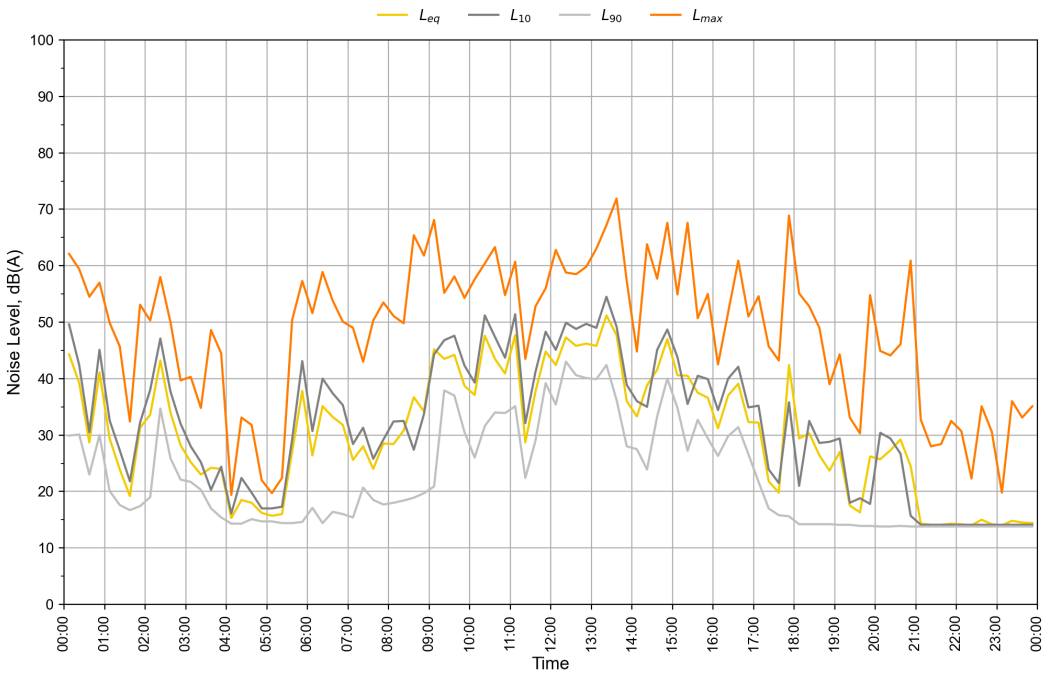
Calibration:
2021-05-10

Resonate

Noise1 - Tootla Road - Friday, 18 June 2021



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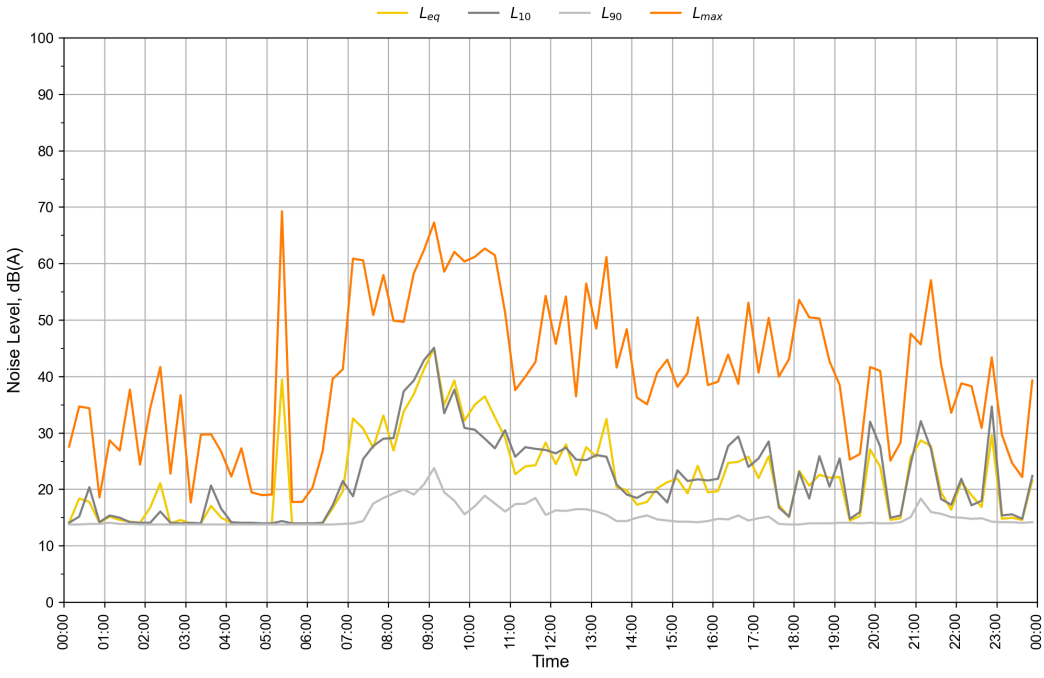
Resonate

Noise1 - Tootla Road - Saturday, 19 June 2021



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Resonate

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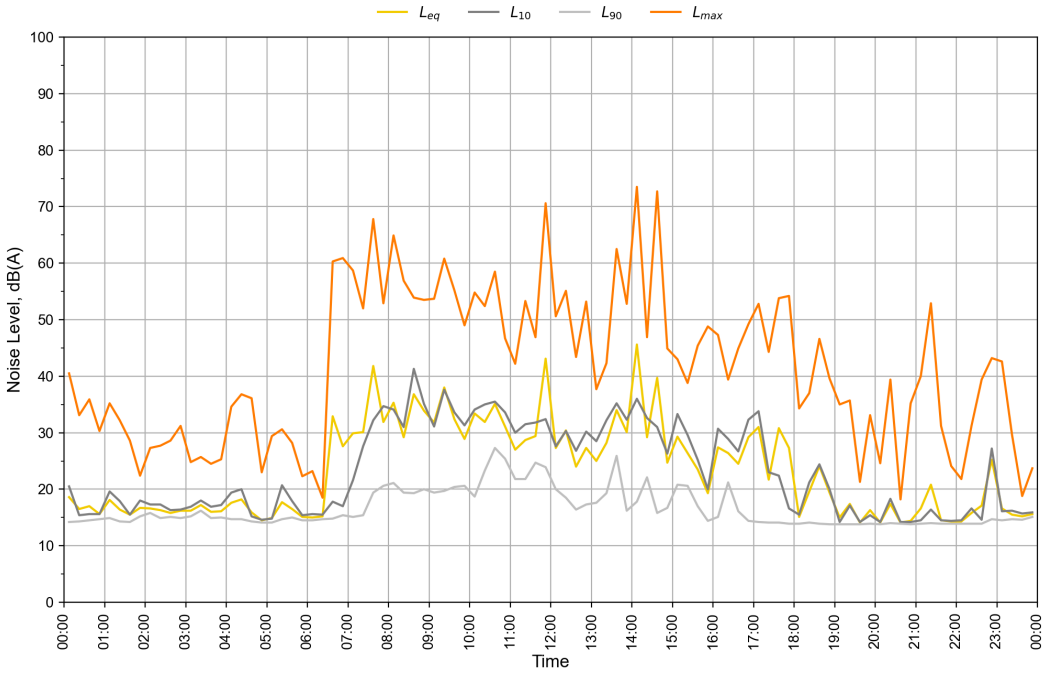

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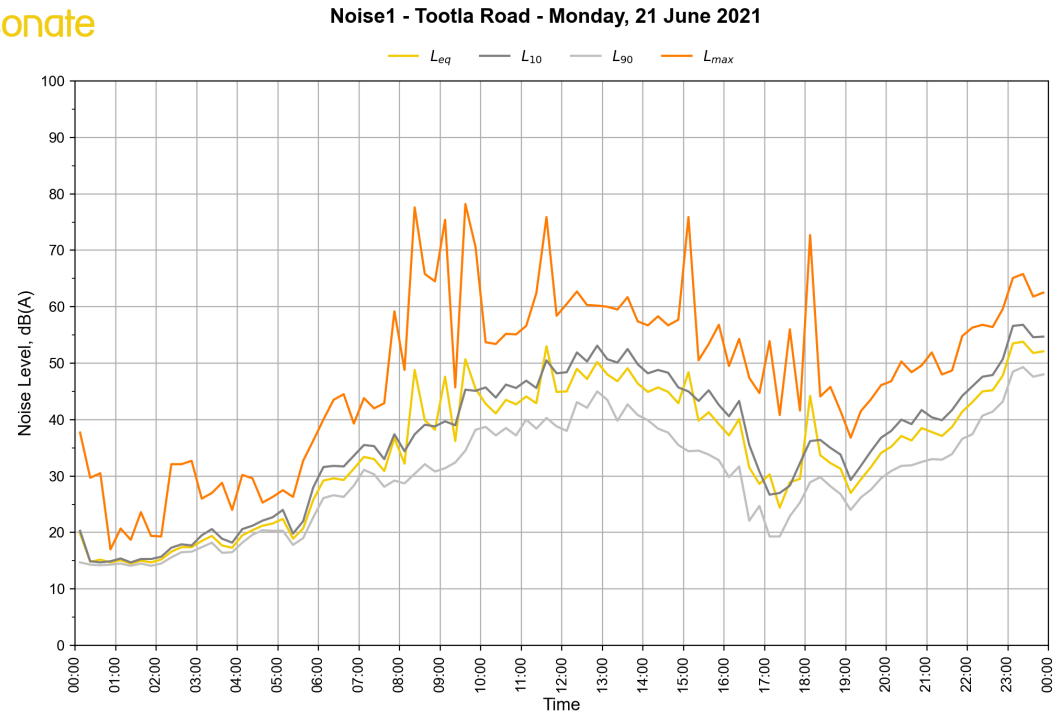

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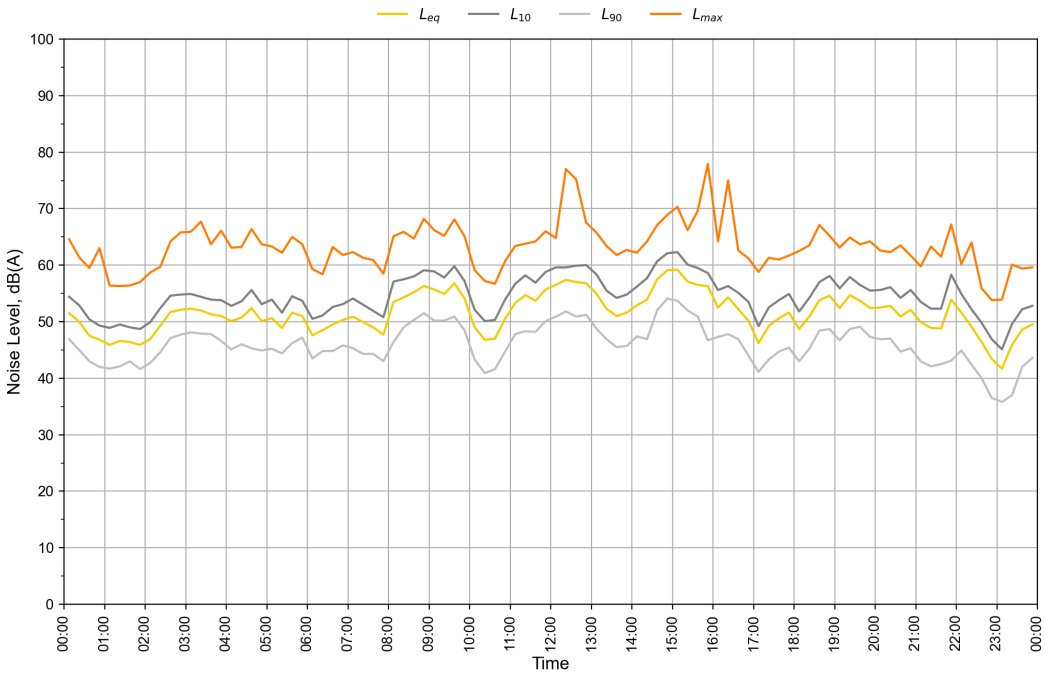

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Resonate

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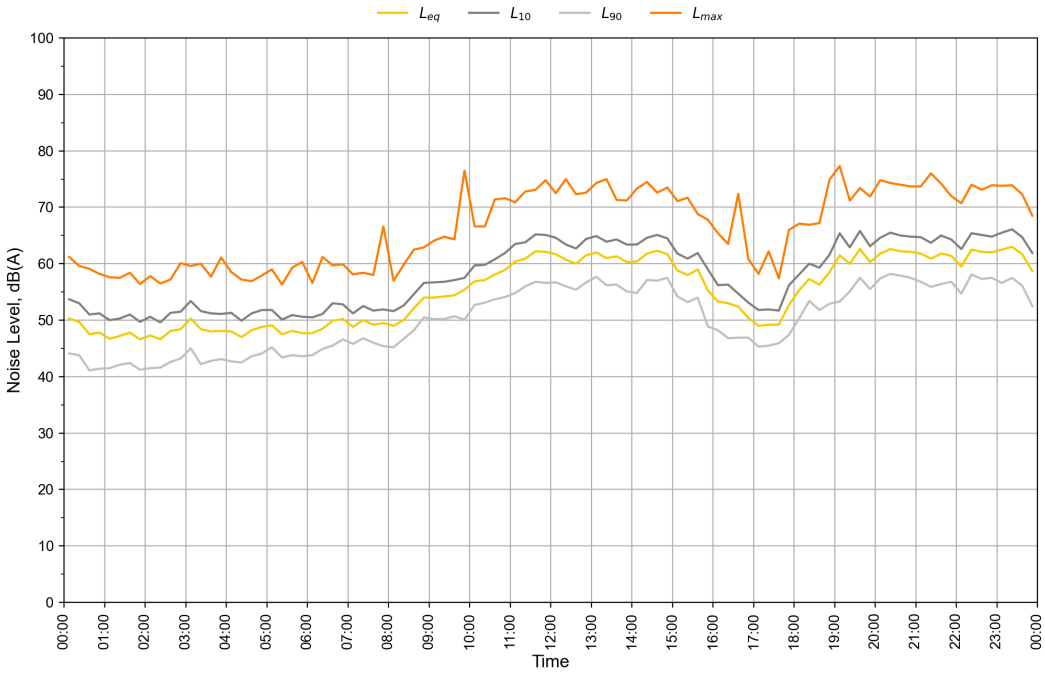

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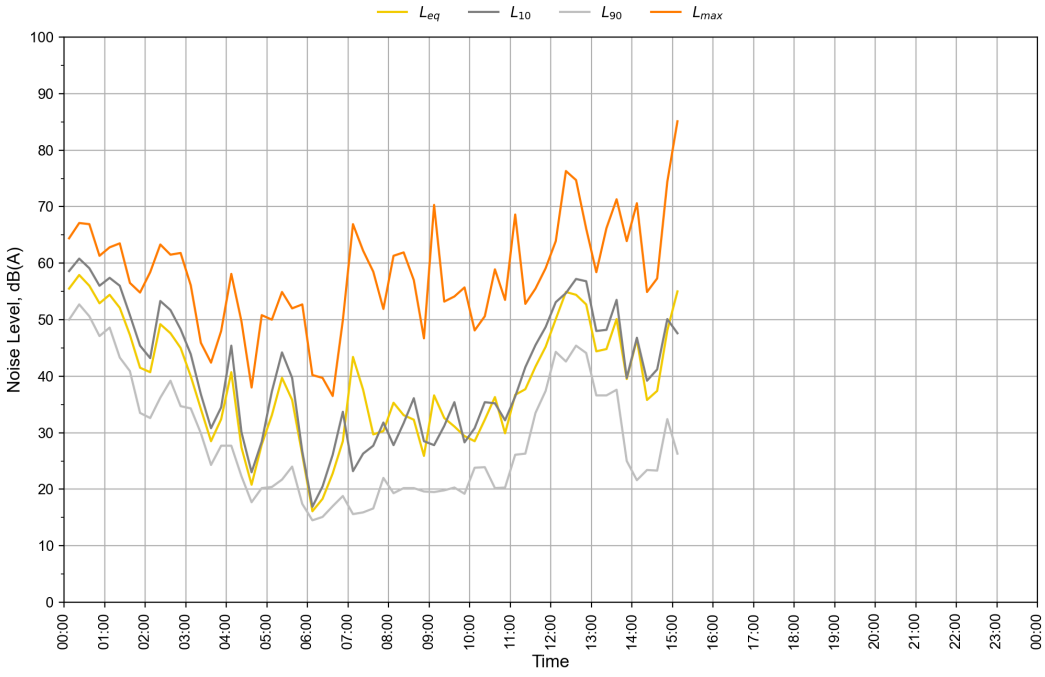
Resonate

Noise1 - Tootla Road - Thursday, 24 June 2021



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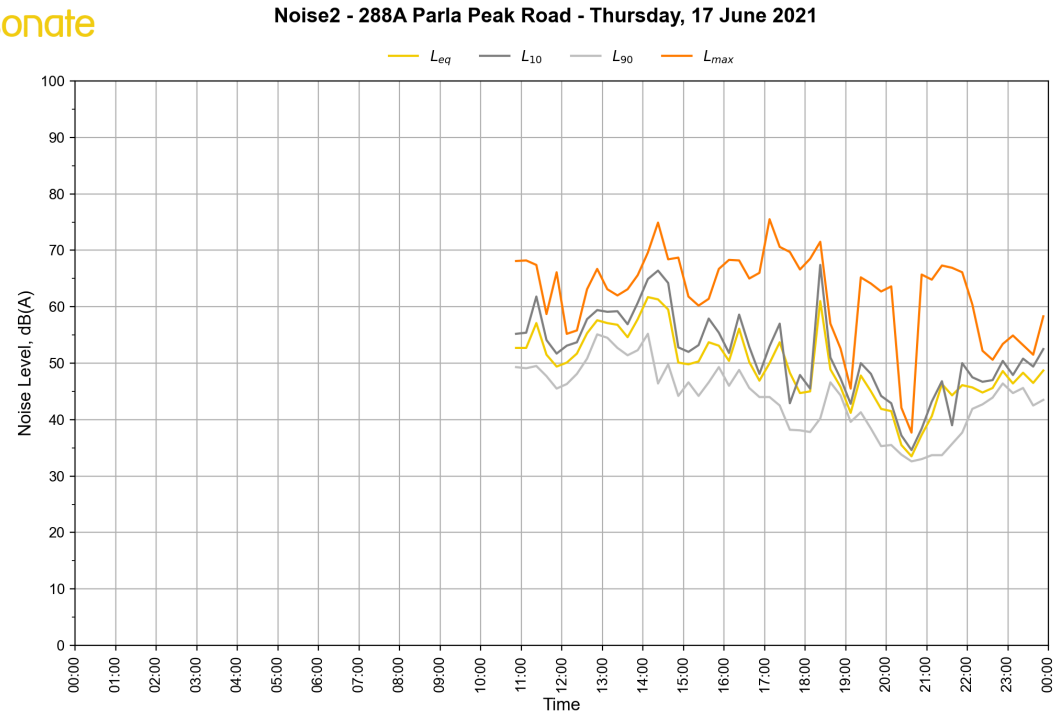

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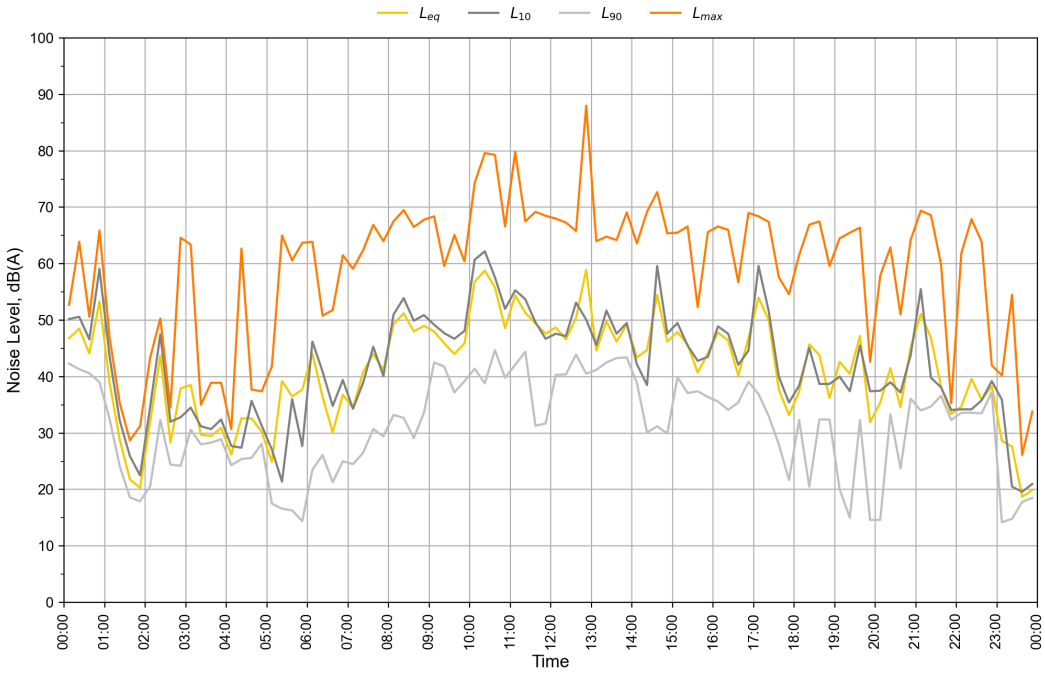

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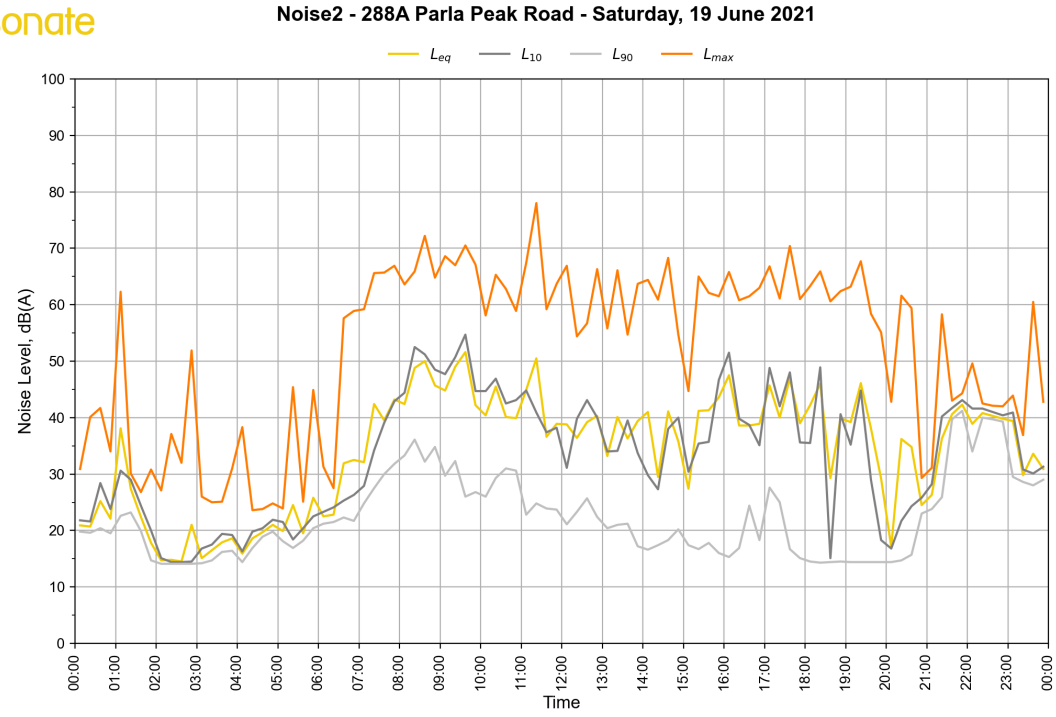

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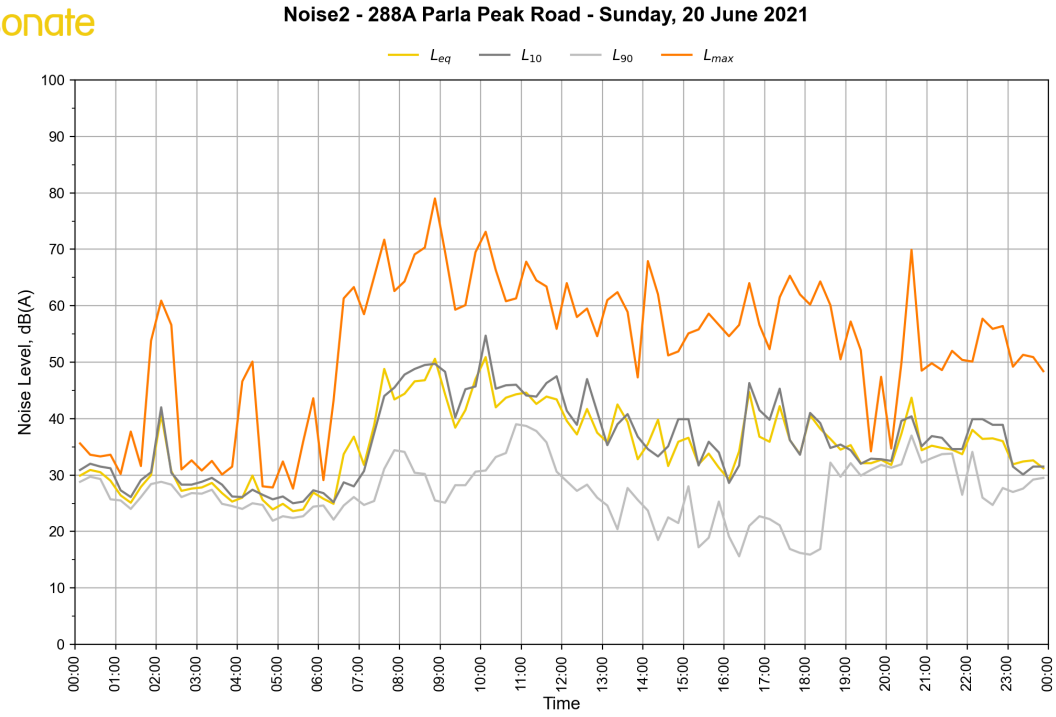
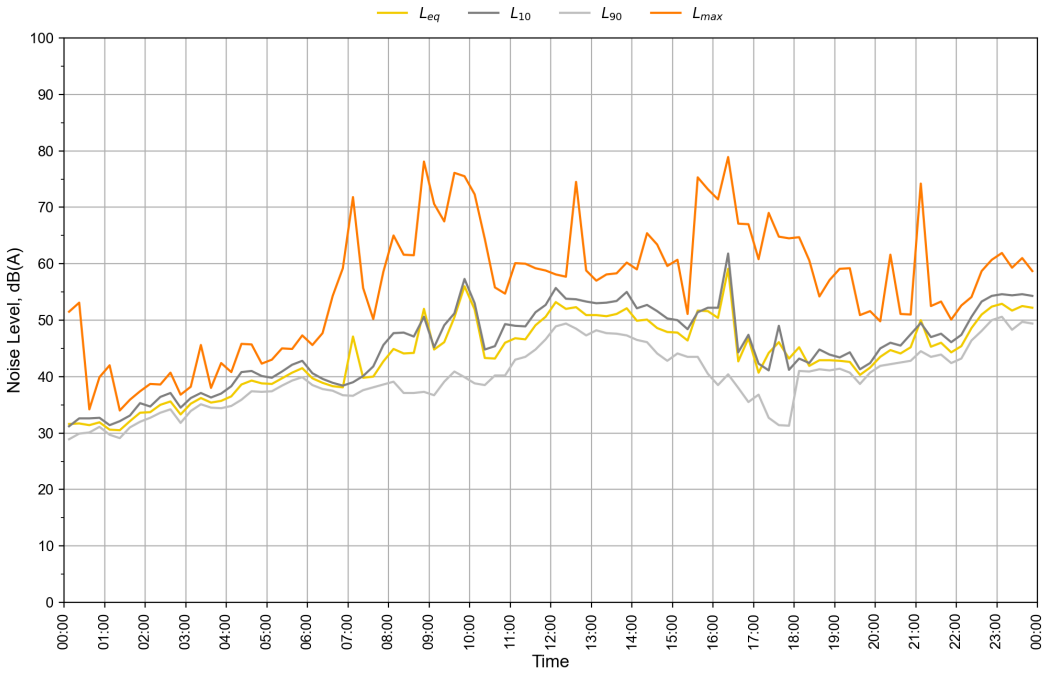


Resonate

Noise2 - 288A Parla Peak Road - Monday, 21 June 2021



Rion NL-42
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Calibration:
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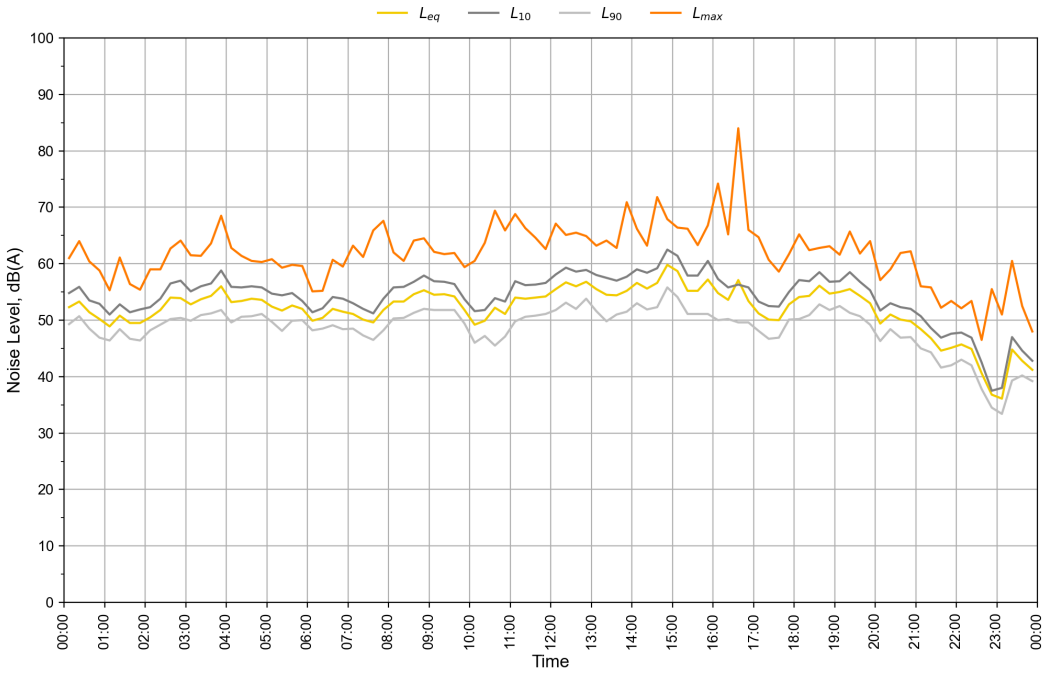
Resonate

Noise2 - 288A Parla Peak Road - Tuesday, 22 June 2021



Rion NL-42
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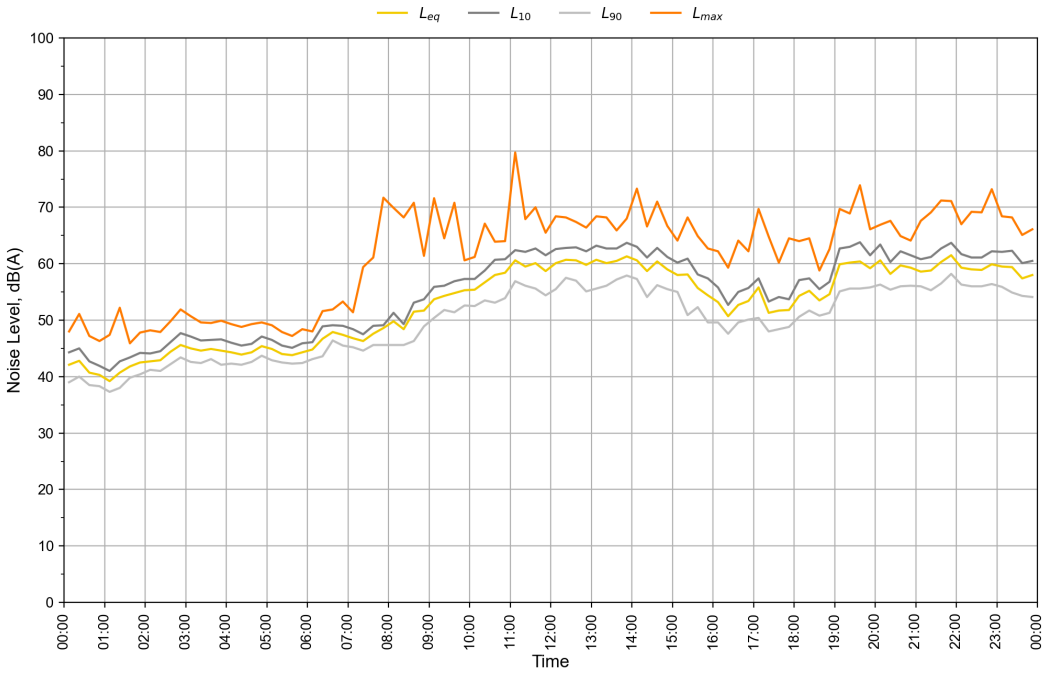
Resonate

Noise2 - 288A Parla Peak Road - Wednesday, 23 June 2021



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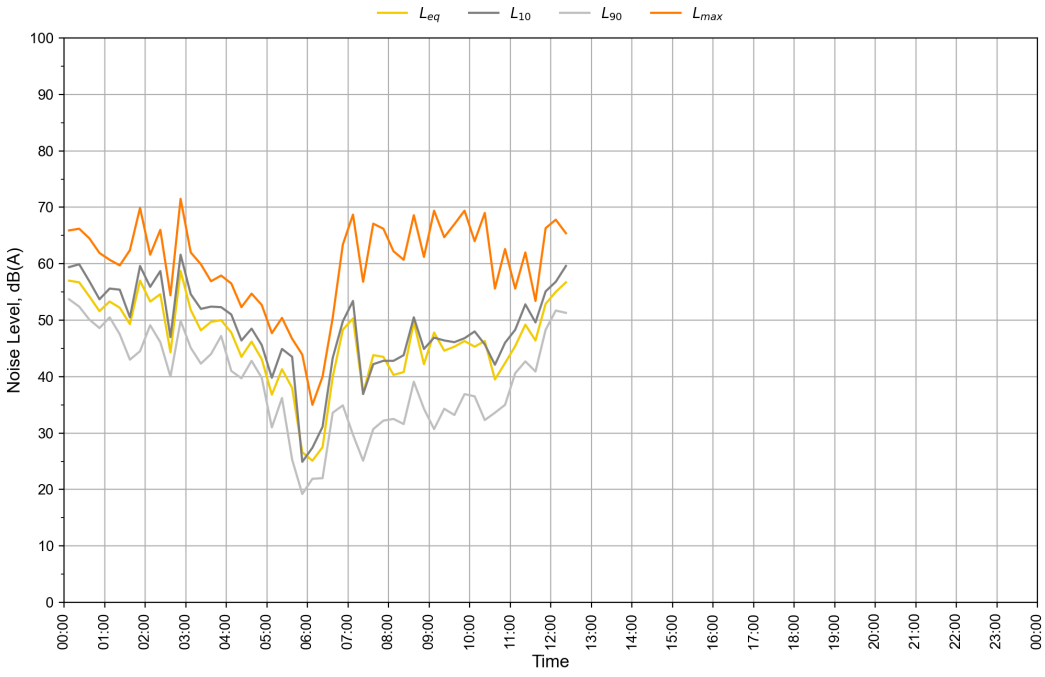
Resonate

Noise2 - 288A Parla Peak Road - Thursday, 24 June 2021



Rion NL-42
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Calibration:
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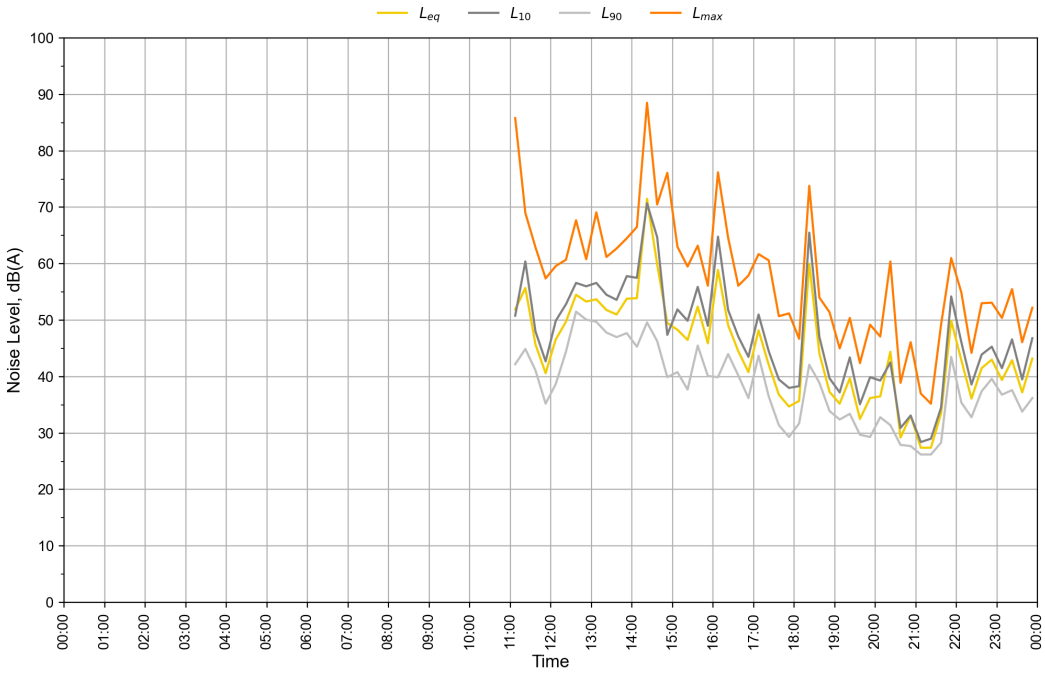
Resonate

Noise3 - 288B Parla Peak Road - Thursday, 17 June 2021



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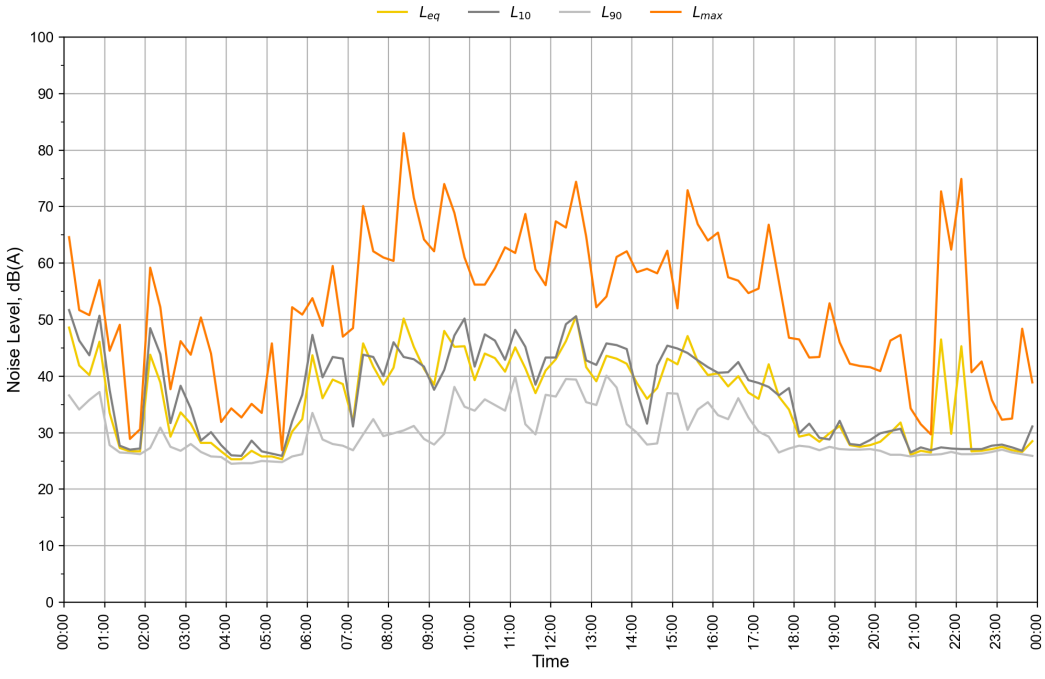

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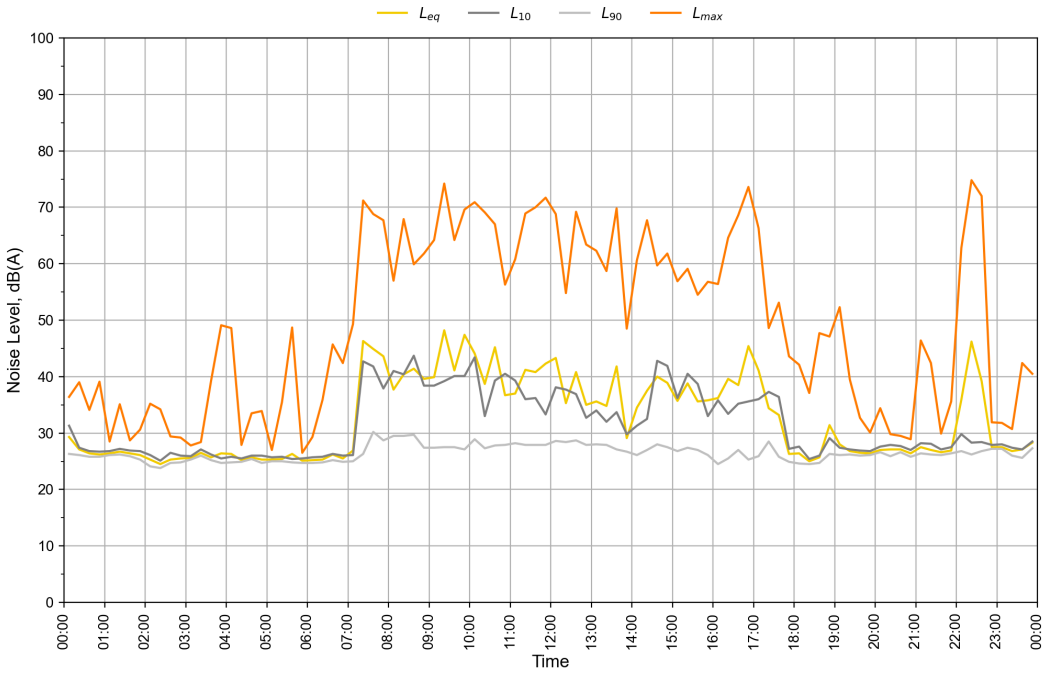

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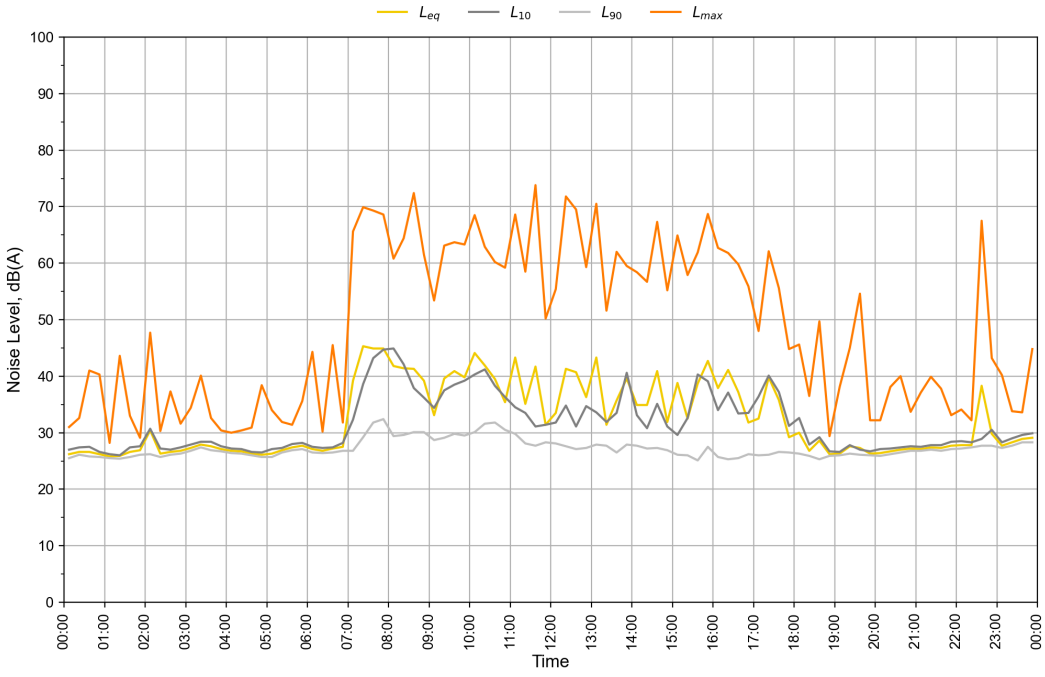

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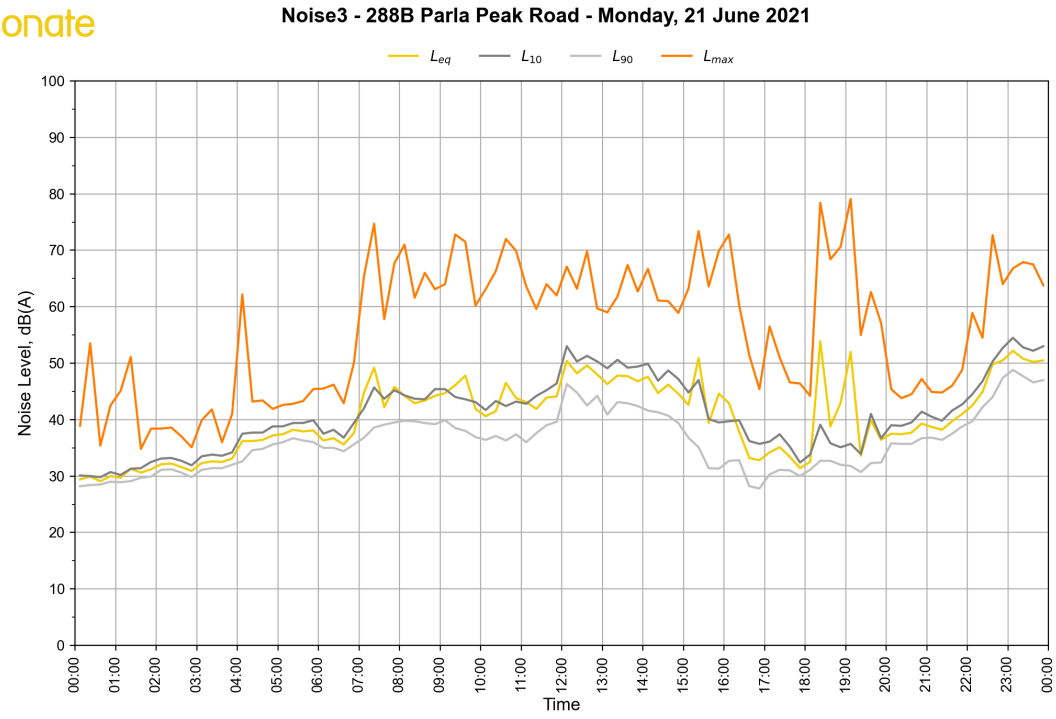

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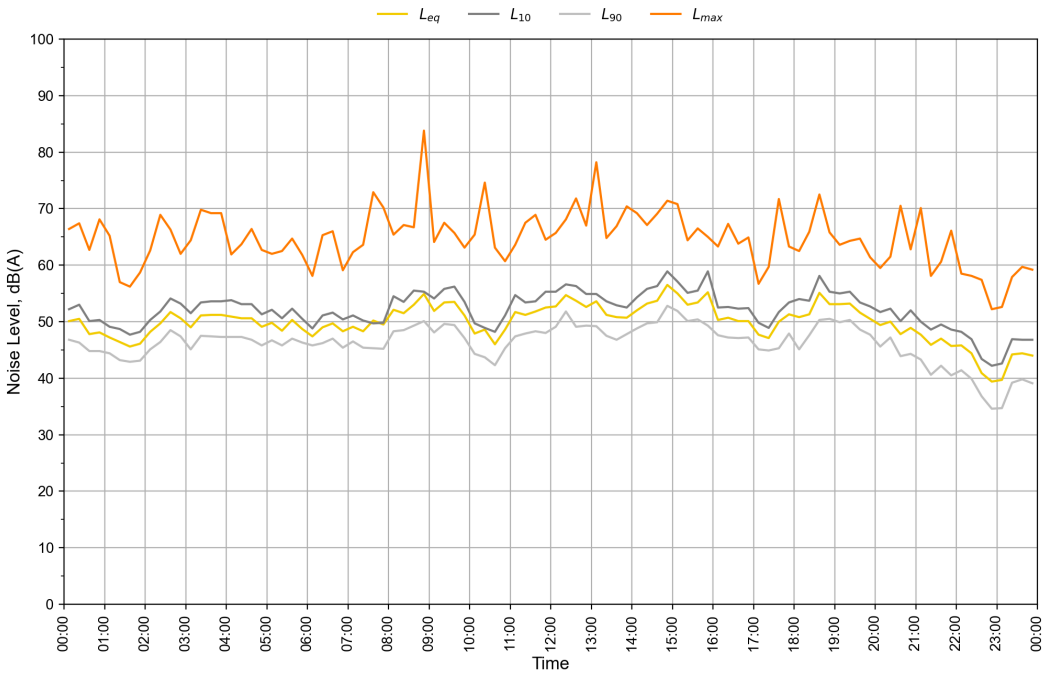

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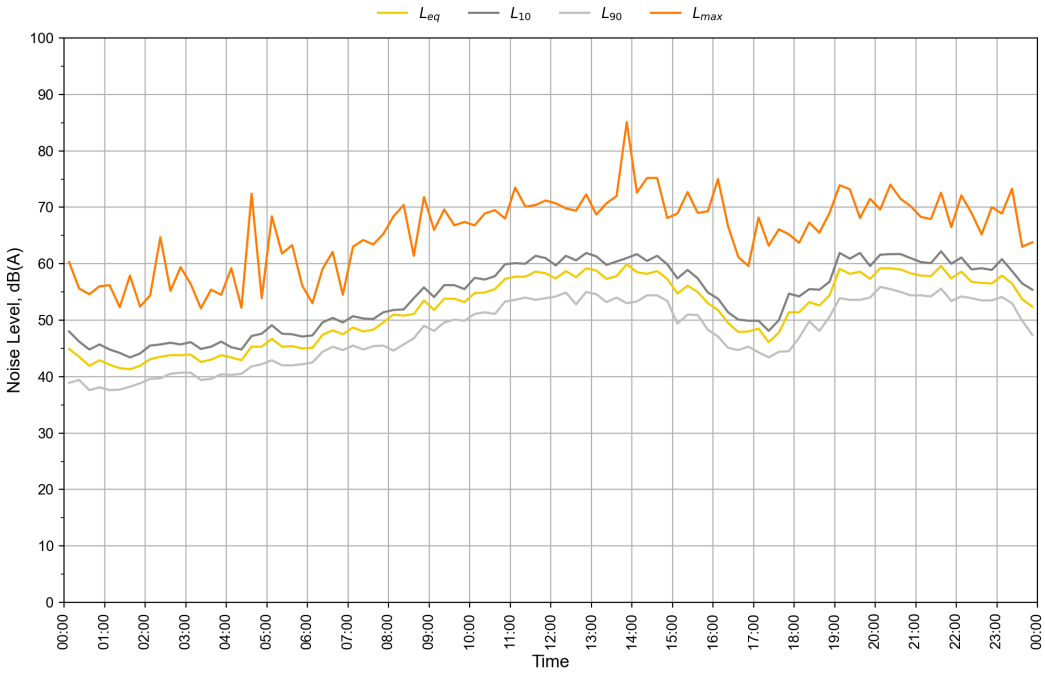

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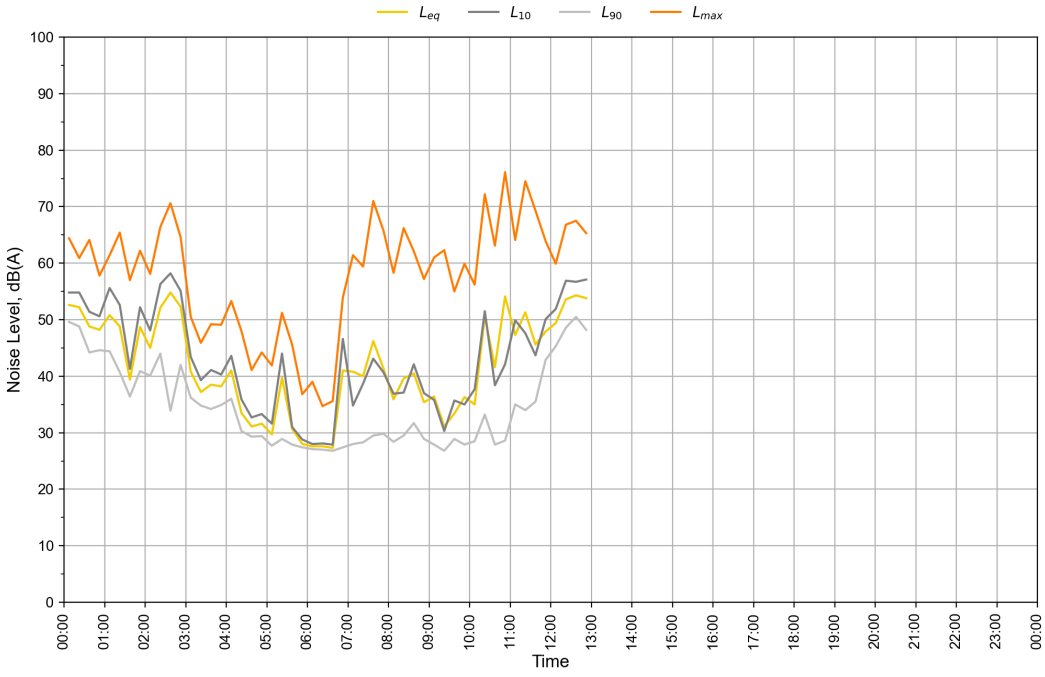

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APPENDIX F – UPDATED EQUIVALENT ANNUAL CO_2 CALCULATIONS

Noted. The incorrect unit of kL/day was used instead of L/day. This has been updated in the tables below (previously Tables 3-20 and 3-22 in the MLP). The changes are shown in red text. The reduced input for diesel use has resulted in significantly reduced CO2-e emissions for the Project.

All emissions estimations have been re-calculated using the Australian Government Clean Energy Regulator's Emissions and Energy Threshold Calculator for the 2019-2020 period, as was calculated at the time of writing the MLP.

Table 1 Energy usage and associated GHG emissions (annual)

Description	Power Requirements			
	Stage One construction	Stage One operation	Stage Two construction	Stage Two operation
Diesel use (~~k~~L/day)	9,800	6,400	6,400	6,400
LPG use (tonnes/day)	N/A	N/A	N/A	20
Diesel associated GHG emissions (tonnes CO_2-e per day)	~~72.75~~ 0.07	~~47.51~~ 0.05	~~47.51~~ 0.05	~~47.51~~ 0.05
LPG associated GHG emissions (tonnes CO_2-e per day)	N/A	N/A	N/A	0.04
Combined Diesel and LPG GHG emissions (tonnes CO_2-e per day)	N/A	N/A	N/A	~~47.56~~ 0.09

Equivalent annual CO_2 generated

Table 2 Greenhouse gas emissions for each stage

Stage	GHG emissions (t CO_2-e/annum)	SA emissions (Mt CO_2-e/annum)[1]	Australian emissions (Mt CO_2-e/annum)[2]	Proportion of SA emissions (%)	Proportion of Australian emissions (%)
Stage One construction	~~26,555~~ 27	24.2	528.7	~~0.11~~ 0.00	~~0.005~~ 0.00
Stage One operation	~~17,342~~ 17	24.2	528.7	~~0.07~~ 0.00	~~0.003~~ 0.00
Stage Two construction	~~17,342~~ 17	24.2	528.7	~~0.07~~ 0.00	~~0.003~~ 0.00
Stage Two operation (diesel and LPG running concurrently)	~~17,358~~ 33	24.2	528.7	~~0.07~~ 0.00	~~0.003~~ 0.00
Stage Two operation	16	24.2	528.7	0.00007	0.000003

Source: (1) DISER, 2020a (2) DISER, 2020b

APPENDIX G – ACID AND METALLIFEROUS DRAINAGE ASSESSMENT

ANDROMEDA METALS LTD

Great White Kaolin Project

Acid and Metalliferous Drainage Assessment

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Executive Summary

An Acid and Metalliferous Drainage Assessment was undertaken by Andromeda Metals Ltd (Andromeda) under the supervision of Dr. Brett Thomas from the University of Adelaide's Acid Sulfate Soils Centre. The study examined the geochemical characteristics of 86 drill samples selected to be representative of the overburden and ore from the Great White Deposit.

The region of the Proposed Development is naturally varied in relation to acidity. The formation of high purity of the Great White kaolin resulted from natural low pH conditions (acidic) that existed during the Tertiary tropical weathering process. More recently, during the drier Pleistocene, environmental changes have introduced calcrete which has an effect of increasing near surface soil pH (alkaline).

Over the long-term formation of the kaolin, most of the mobile elements have previously leached out and the zone of oxidisation (to the base of the decomposed granite below the kaolin) system is stable with low potential for acid and/or metalliferous seepage.

Key Findings

Although samples with pH 4.5–4.6 were identified, the potential for material to be net acid producing was considered to be overall low. Test work shows the potentially acidic and acidic material has a low capacity to release potential or actual acidity as the acidity is bound up in low permeability clay (Thomas 2020). Although saline conditions may accelerate acidification and leaching of metals, calcrete is readily available across the Proposed Development area to aid neutralisation of potential acidic soils.

This was confirmed by Acid Base Accounted (ABA) of samples, which indicated that all samples have a low capacity to generate further acidity through the oxidation of pyrite, as reduced inorganic sulfur contents were below the Acid Sulfate Soil (ASS) action criteria of 0.03% Chromium Reducible Sulfur method (CRS) for Total Potential Sulfidic Acidity (TPS). The ABA results show that the low pH of samples can be attributed to the existing acidity of the samples, which can be expected in an oxidising environment.

The results of the geochemical analysis of the overburden and ore zone indicate that no elements occur at average or peak concentrations above Health based Investigation Levels (HILs) for commercial and industrial sites as described under Schedule B(1) of the National Environmental Protection Council (NEPC) Guideline on Investigation Levels for Soil and Groundwater.

Overall, there is not considered to be a credible source of acidity, nor receptor to be able to be impacted by acid and/or metalliferous seepage from overburden stockpile.

Recommendations

It is recommended that a Conceptual Acid and Metalliferous Drainage Management Plan (CAMDMP) be prepared that considers the geological model, mine plan in addition to the existing geochemical data and AMD risk profile for the Year 1-2 pit works.

Following MLA approval, the CAMDMP will need to be updated for inclusion in the Program of Environmental Protection and Rehabilitation (PEPR), to ensure that best practice AMD management

measures are adopted in the mine design, operation, mine closure and rehabilitation stages of the project.

The CAMDMP needs to be a living document that will need to be updated as new AMD information becomes available and as the development of the mining operation is refined.

Glossary

AMD – Acid and Metalliferous Drainage – A low pH, metal-laden, sulfate-rich drainage that occurs during land disturbance where sulfides are exposed also known as acid rock drainage (ARD).

ABA – Acid Base Accounting – An analytical technique applied to mine wastes and geologic materials that determines the potential acidity from sulfur or sulfides, which produce acid when oxidised. Acid can also be present as acid sulfates or generated by their weathering, produced originally from oxidation or sulfides.

AC – Acid Consuming – Material that contains a large proportion of carbonate minerals with excess acid neutralising capacity

ANC – Acid Neutralising Capacity – Neutralising potential determined by titration expressed as kg H_2SO_4/t

ANP – Acid Neutralisation Potential – The amount of alkaline or basic material in rock or soil materials that is estimated by acid reaction followed by titration to determine that capability of neutralising acid from exchangeable acidity

ASS – Acid Sulfate Soil – Naturally occurring soils, sediments, or organic substrates (e.g. peat) that are formed under waterlogged conditions. These soils contain iron sulfide minerals (predominantly as the mineral pyrite) or their oxidation products. In an undisturbed state below the water table, potential acid sulfate soils are benign. However, if the soils are drained, excavated or exposed to air by a lowering of the water table, the sulfides react with oxygen to form sulfuric acid

AASS – Actual Acid Sulfate Soil – Actual acid sulfate soils have already undergone oxidation to produce acid with a pH of 4 or less

CAMDMP – Conceptual Acid and Metalliferous Drainage Management Plan

DFS – Definitive Feasibility Study – Is an evaluation of a proposed mining project to determine whether to proceed with the project or not.

DSO – Direct Shipping Ore – Product of a mining activity that is bulk ore that ships from mine site directly to refinery to extract commodity

EC – Electrical Conductivity – Indicated the concentration of ionized constituents in a water sample or soil matrix

EPA SA – Environmental Protection Agency – Government of South Australia

Ferrolysis – The term ‘ferrolysis’ was coined by Brinkman (1970) to describe a ‘hydromorphic soil forming process’ involving the seasonally alternating cycles of oxidation and reduction of iron due to waterlogging and drying of the soil profile

Groundwater Parameters – List of analyses required may include pH, EC, TDS, alkalinity, major ions, and metals/metalloids

IOL – Integrated Overburden Landform / Waste Stockpile – A structure constructed to contain all waste in perpetuity

MPA – Maximum Potential Acidity – Total sulfur expressed in kg H_2SO_4/t

NATA – National Association of Testing Authorities – Standard methods for Australia

NAG – Net Acid Generation – Analytical test using peroxide to rapidly oxidise all reactive minerals in a sample and test resulting pH of solution for ultimate determination of acid potential. Does not take into account different rates of oxidation of minerals

NAPP – Net Acid Production Potential – The difference between the maximum potential acidity (MPA) and the neutralisation capacity (ANC) of a rock or soil sample (i.e. NAPP = MPA-ANC)

NMD – Neutral Mine Drainage – A near neutral pH, metal-laden, sulfate-rich drainage that occurs during land disturbance where sulfur or metal sulfides are exposed to atmospheric conditions. It forms under natural conditions from the oxidation of sulfide minerals and where the alkalinity equals or exceeds the acidity

NAF – Non- Acid Forming – Material that contains a greater proportion neutralising mineral than acid-forming minerals

Podzol – A 'podzol' profile has a highly leached whitish-grey lower 'A' horizon and there is accumulation of minerals and/or organic in the 'B' horizon as evidenced by stronger colours. This process may be driven by ferrolysis (iron hydrolysis)

PAF – Potentially Acid Forming – Material that contains a greater proportion of acid-forming minerals than neutralising minerals

PAF - LC – Potentially Acid Forming - Low Capacity – Material that contains a marginally greater proportion of acid-forming minerals than neutralising minerals

PASS – Potential Acid Sulfate Soil – Potential acid sulfate soils are soils containing iron sulfides (commonly pyrite) which have the potential to produce sulfuric acid if they are drained or excavated, resulting in a pH of 4 or less

Redox – Shorthand for reduction-oxidation. Describes all chemical reactions in which atoms have their oxidation number (oxidation state) changed, most commonly through the transfer of electrons.

ROM – Run of Mine – Relating to ore that is crude or ungraded, etc.

SS – Scoping Study – Exploratory projects that systematically: map the literature available on a topic, identifying key concepts, theories, sources of evidence and gaps in the research

Sediment – Any particulate matter that can be transported by fluid flow, and which eventually is deposited

Static Testing – Series of short-term tests for acid potential, total elements and leaching potential

TDS – Total Dissolved Solids – The mass of both organic and inorganic matter, in solution in a volume of water. The amount of dissolved solids should be determined by filtering water through a 0.2µm filter, drying 180°C and weighing the residue remaining.

TPS – Total Potential Sulfidic Acidity – potential acidity from reduced sulfur or sulfides, which produce acid when oxidised, expressed in kg H_2SO_4/t

Toxicity – A property of a substance that indicated its ability to cause physical and/or physiological harm to an organism (plant, or animal), usually under particular condition and above a certain concentration limit, below which no toxicity effects have been observed

UC – Uncertain – Material classification is unclear, and depending on the magnitude of NAPP and the NAG pH further testing may be required to determine the potential for AMD production

1. Introduction

Andromeda Metals Ltd (ADN, Andromeda) is the Operator of the Great White Deposit which is situated on the Tootla tenement Exploration Licence 5814 (EL 5814) within the Great White Kaolin Project. Great White is located approximately 635 km west by road from Adelaide and 65 km east of Streaky Bay on the Eyre Peninsula, South Australia, see Figure 1. The topography of the work site is generally flat, comprising of low undulating landforms. Much of the land has been cleared for sheep grazing and cereal crops, with some remnant patches of mallee open scrub vegetation.

Andromeda proposes to excavate a series of open pits to remove overburden and extract halloysite kaolin ore. The initial stage of mining is anticipated to take 2 years. During this phase of mining, waste material will be brought to the surface and stored, Following on from year 2 all waste material will be relocated into the existing mine-void.

The Acid and Metalliferous Drainage (AMD) data presented in this report has been modelled and assessed by Dr. Brett Thomas from the University of Adelaide's Acid Sulfate Soils Centre.

Detailed characteristics of the work site are described in Andromeda Metals (2020) Pre-Feasibility Study Report "Pre-Feasibility Study Further Improves Poochera Halloysite-Kaolin Project Economics" dated 10 June 2020.

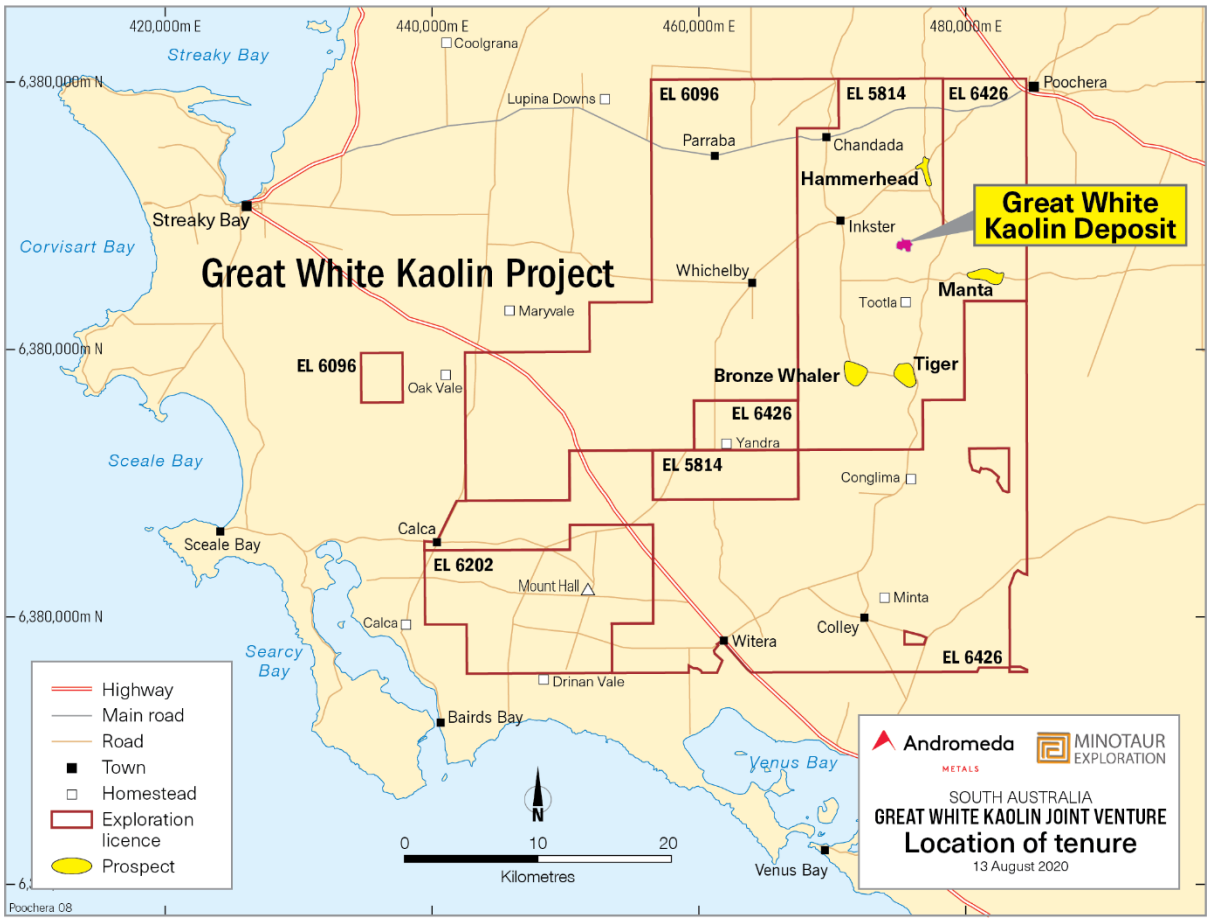

Figure 1: Great White Kaolin Project location

2. Existing Environment

2.1. Local Geology

The Great White Kaolin Deposit developed in-situ due to deep, lateritic weathering of Hiltaba Suite granite during the tropical Tertiary period (66 Ma to 2.6 Ma). Humic acid-bearing groundwater converted microcline feldspar to kaolin minerals with remnant silica grains, producing sub-horizontal zones of kaolinised granite overlying unweathered granite. The kaolinised granite zones vary in thickness from a few metres to over 25 m and are separated from each other by areas of outcropping or near-surface granite. The kaolinised unit is overlain by 8-27 m of loosely consolidated Quaternary sediments (refer to Figure 2 and Table 1).

The granite, where irregularly exposed at surface, is typically coarse grained and comprises predominantly microcline feldspar and quartz with minor plagioclase and biotite. The zone of bright white kaolinised granite at Great White Deposit has a northeast strike around 2,000 m long and is 500-1200 m wide. The deposit occupies an apparent palaeo-valley filled with Quaternary aeolian sediments. In-situ, the kaolin resource is unusually white and when processed the clay platelets separate and disperse leaving a very fine-grained product. Importantly, in addition to micron size kaolinite platelets, kaolin is also present in parts of the deposit as halloysite, a nano-tubular form, which is a highly desirable form of kaolin in industrial markets.

The kaolinised granite consists of approximately equal amounts of kaolin and medium-to coarse-grained quartz with very small amounts of white mica and anatase. The kaolinised granite can be divided into Upper and Lower saprolite with remnant feldspars more predominant in the lower, less kaolinised zone. Irregular patches of secondary iron oxides staining occur through the kaolinised granite becoming more prevalent near the base of the kaolinised zone.

Kaolinised granite is preserved beneath and protected by Quaternary calcrete, clay, silt and sand. It is directly capped on the Western half of the deposit by a thin silcretised sands unit unconformably overlying a silcretised kaolin horizon with a combined thickness of 1-5m.

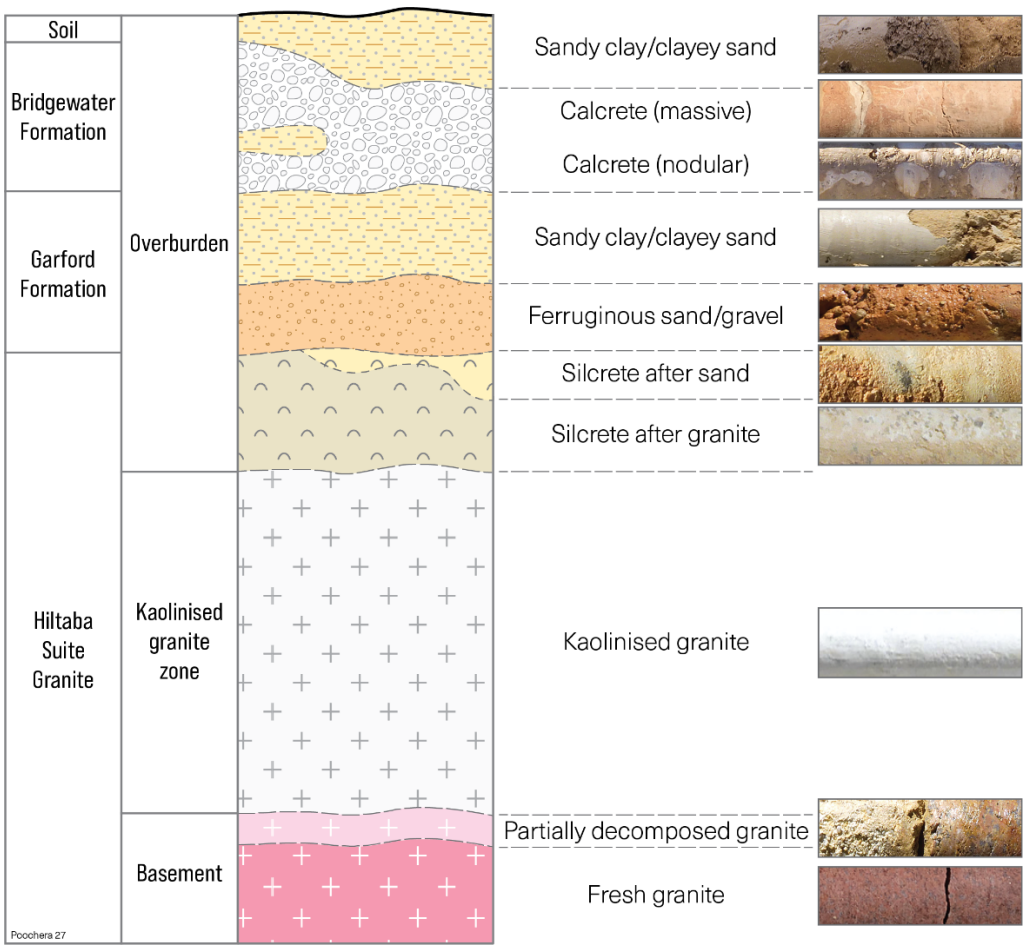

Figure 2: Main Geological units

Table 1: Main Geological units

Geological units	Description
Soil	B3: Shallow sandy loam on calcrete and shallow sand on calcrete. In some areas a 'podzol' profile may form where iron oxyhydroxides have been mobilised from the topsoil (A Horizon) and accumulated in the subsoil (B horizon) (Podsolization)
Bridgewater Formation (Qpew):	Orange yellow-orange quartz sand and sand containing soft blocky calcrete – equivalent of Bridgewater Formation
Garford Formation (Tig) Miocene-Pliocene:	Oxidised lacustrine, fluvial and colluvial sediments comprising fine to coarse grained orange, pale yellow, red and purple angular to well-rounded silty sand; (khaki) to grey-green and brown silty clay and black carbonaceous clay and silt. Silcreted and ferricreted horizons common
Gawler Craton: Hiltaba Granite (Mh) (Mesoproterozoic):	Pink to reddish, fine to medium grained leucocratic granite, granodiorite and adamelite with veins of microgranite, aplite, and pegmatite. Minor biotite, muscovite, and hornblende. Accessory minerals; zircon, allanite, sphene, magnetite and fluorite. Mh5 and Mh4 units of the Hiltaba Granite may contain up to 3% pyrite.

2.2. Hydrogeology

A hydrogeology assessment was carried out by Aldam Geoscience in 2020. The investigation targeted the two aquifers, the upper Garford Formation, and the lower Hiltaba Granite. The groundwater level varies between 18-24 metres below the surface.

The Garford Formation was observed to be dry over most of the proposed pit area and to the east of it, with saturation occurring only in a narrow trough like area to the east section of the proposed pit. Groundwater was brackish to saline, with an EC as low as 6.9mS/cm (3,795 TDS) and 12.57mS/cm (6,913 TDS), suitable for industrial use. The pH is neutral to acidic with a pH of 6 to 7.5. Well yields were low, with only seepage flows being recorded. The hydraulic conductivity and transmissivity were also low, with the direction of groundwater movement observed to be north, northeast with measured hydraulic gradient of approximately 0.004.

Groundwater was not encountered in the kaolinised granite. Laboratory permeability values are very low, indicating that this unit functions as an aquitard. Groundwater was not encountered in the partially decomposed granite (PDG) however, groundwater might occur in places.

Deep drilling below the planned final pit design intersected minor groundwater in the unweathered Hiltaba granite. Although a high yield was produced by air-lift development, lower yields were obtained during the test pumping. Significant downdraw was recorded during the test pumping, and recovery was observed to be slow. This indicated that the fractured rock aquifer is compartmentalised, with fractures not uniformly connect. This means that significant amounts of water could occur at some locations but not others, and were present, could be rapidly depleted.

Water quality in the Hiltaba Granite aquifer is suitable for industrial purposes but is marginal for stock and unsuitable for human consumption, with an EC between 10mS/cm (5,500 TDS) and more than 20mS/cm (11,000 TDS). The pH was observed to be neutral to alkaline with a pH 7.9 to 8.1. Groundwater flows approximately west to east in the granitic basement under a hydraulic gradient of 0.0125.

2.2.1. Possible origins of the acidic groundwater

Generation of acidic groundwaters at the site is an existing condition that is likely due to landscape processes, which have directly or indirectly involved sulfide oxidation over time. These processes include:

- Oxidation of diagenetic pyrite, ammonium nitrogen, and iron in former marine and lacustrine sediments and soils
- Oxidation of sulfide minerals in the Hiltaba Granite
- Podzilic to lateritic profile weathering involving ferrolysis (described as a ‘hydromorphic soil forming process’ involving the seasonally alternating cycles of oxidation and reduction of iron and aluminium due to waterlogging and drying of the soil profile (iron and aluminium hydrolysis).

- Clearing of native vegetation that resulted in a rise in water tables bringing; i) acid saline waters from the deeper subsurface to near-surface environments and / or ii) neutral to alkaline groundwater into contact with acidic sediment or soil layers.

The oxidation of diagenetic hydrogen sulfide (H2S) was considered as potential source of acidity, however it is considered unlikely due to the low organic matter content of Quaternary and Tertiary sediments. Alternatively, under certain hydrological conditions gypsum in aeolian deposits (e.g. dunes and lunettes) can be altered to calcite releasing acidity.

Results for pH, suspended solids, salinity as electrical conductivity (EC) and total dissolved solids, cations, anions, alkalinity, hardness and nutrients are presented in Table 2, whilst metals concentrations are in Table 3 and the location of the bores are shown on Figure 3.

The results indicate that in the basement unit samples, groundwater is of neutral to slightly alkaline pH, and is of moderate to high salinity. Salinities of the Garford Formation samples are similarly brackish to high, but pH is acidic. Metal concentrations in all samples are low. Nutrient concentrations in all samples are low, with the exception of CW20WB002.

Table 2. Groundwater laboratory results – standard analysis

			Sample ID and result					
			CW20MB003	CW20MB004	CW20WB002	CW20WB005	CW20WB006	CW20WB003
Sample type			Primary	Duplicate of CW20MB003	Primary	Primary	Primary	Primary
Aquifer			granite basement	granite basement	Garford Formation	Garford Formation	granite basement	granite basement
Analyte	**Unit**	**LOR[1]**						
pH	Unit	0.01	7.05	7.05	5.57	6.04	7.20	6.99
Electrical Conductivity @ 25°C	µS/cm	1	12800	12800	9190	15900	13300	32000
Total Dissolved Solids	mg/L	1	8320	8320	5970	10300	8640	20800
Suspended Solids (SS)	mg/L	5	16	17	10	28	18	47
Calcium	mg/L	1	73	74	62	145	76	355
Magnesium	mg/L	1	130	130	103	215	134	873
Sodium	mg/L	1	2320	2300	1580	2840	2350	5020
Potassium	mg/L	1	56	54	46	93	55	159
Sulfate as SO_4	mg/L	1	831	822	462	917	834	1700
Chloride	mg/L	1	4060	3950	3050	5240	4160	10900
Fluoride	mg/L	0.1	8.1	7.9	0.9	0.3	7.4	3.8
Phosphorus as P	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulfide as S^{2-}	mg/L	0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
Ammonia as N	mg/L	0.01	0.25	0.23	0.13	0.08	0.12	0.32
Nitrite as N	mg/L	0.01	0.01	0.01	0.04	0.02	0.01	<0.01
Nitrate as N	mg/L	0.01	1.44	1.37	15.4	2.65	1.38	<0.01

			Sample ID and result					
			CW20MB003	CW20MB004	CW20WB002	CW20WB005	CW20WB006	CW20WB003
Nitrite + Nitrate as N	mg/L	0.01	1.45	1.38	15.4	2.67	1.39	<0.01
Total Kjeldahl Nitrogen as N	mg/L	0.1	0.6	0.3	0.6	0.6	0.2	0.3
Total Nitrogen as N	mg/L	0.1	2.0	1.7	16.0	3.3	1.6	0.3
Total Phosphorus as P	mg/L	0.01	<0.01	<0.01	<0.01	0.02	0.02	<0.01
Total Hardness as $CaCO_3$	mg/L	1	718	720	579	1250	742	4480
Hydroxide Alkalinity as $CaCO_3$	mg/L	1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as $CaCO_3$	mg/L	1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as $CaCO_3$	mg/L	1	167	170	5	23	174	197
Total Alkalinity as $CaCO_3$	mg/L	1	167	170	5	23	174	197
Sodium Adsorption Ratio		0.01	37.7	37.3	28.6	35.0	37.5	32.6
Total Anions	meq/L	0.01	135	132	95.8	167	138	347
Total Cations	meq/L	0.01	117	116	81.5	151	118	312
Ionic Balance	%	0.01	7.34	6.50	8.06	5.19	7.69	5.28

[1]LOR denotes limit of reporting

Table 3 Groundwater laboratory results – metals analytical results

			Sample ID and result					
			CW20MB003	CW20MB004	CW20WB002	CW20WB005	CW20WB006	CW20WB003
Sample type			Primary	Duplicate of CW20MB003	Primary	Primary	Primary	Primary
Aquifer			granite basement	granite basement	Garford Formation	Garford Formation	granite basement	granite basement
Analyte	Unit	LOR[1]						
Antimony	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Beryllium	mg/L	0.001	0.005	0.005	<0.001	<0.001	0.005	0.003
Barium	mg/L	0.001	0.028	0.028	0.055	0.038	0.024	0.028
Cadmium	mg/L	0.0001	<0.0001	<0.0001	0.0001	0.0002	<0.0001	<0.0001
Chromium	mg/L	0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001
Cobalt	mg/L	0.001	0.008	0.008	0.011	0.053	0.005	<0.001
Copper	mg/L	0.001	0.028	0.072	0.028	0.007	0.007	0.038
Lead	mg/L	0.001	0.002	0.004	0.004	<0.001	0.003	0.002
Manganese	mg/L	0.001	1.26	1.29	0.045	0.319	1.32	1.40
Nickel	mg/L	0.001	0.013	0.010	0.010	0.024	0.010	0.003
Selenium	mg/L	0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
Silver	mg/L	0.001	0.002	<0.001	<0.001	0.001	<0.001	<0.001
Thorium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tin	mg/L	0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001
Uranium	mg/L	0.001	0.003	0.003	0.006	0.002	0.002	0.004
Vanadium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	0.113	0.174	1.35	0.403	0.048	0.161
Boron	mg/L	0.05	3.09	2.99	2.26	3.11	2.96	2.93
Iron	mg/L	0.05	1.70	2.36	0.36	0.09	1.43	6.83
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

[1]LOR denotes limit of reporting

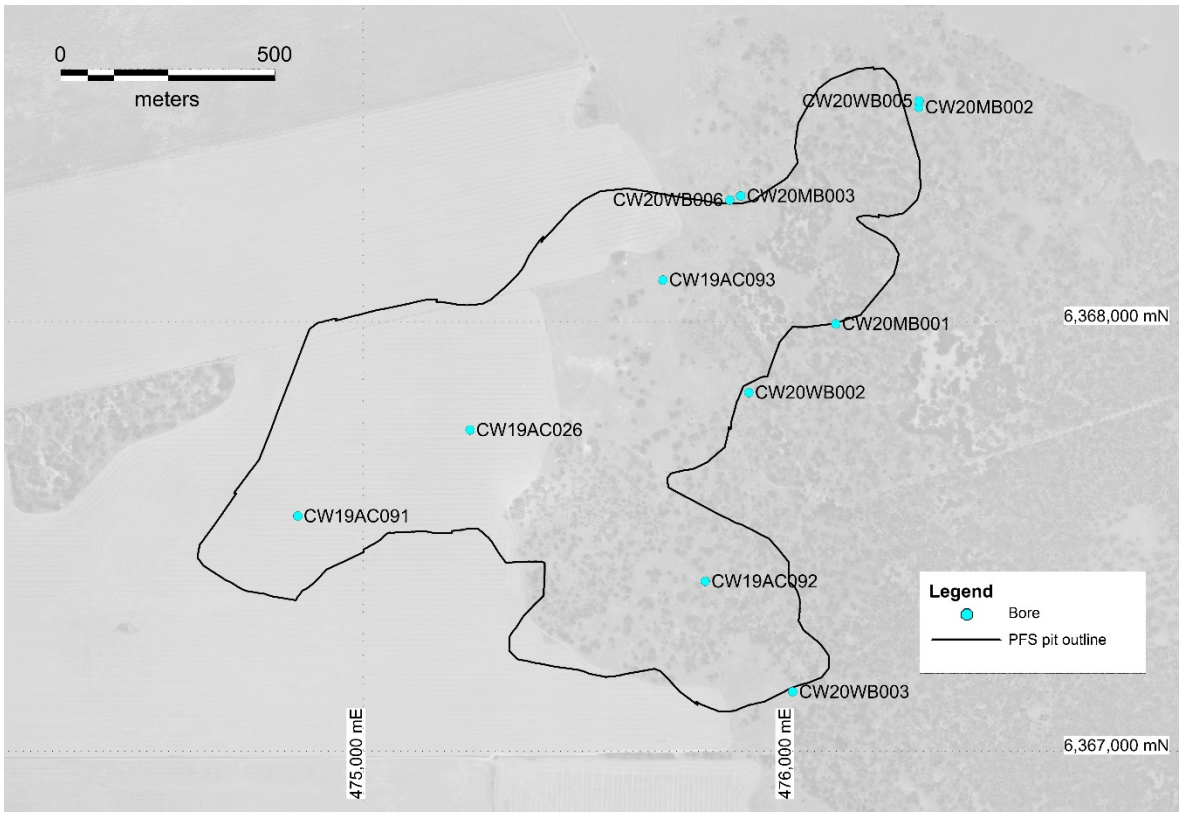

Figure 3: Water bore locations and 2020 PFS pit outline

2.3. Geochemistry of the overburden

A waste-rock characterisation study was undertaken that examined the geochemical characteristics of both the mineralisation and the overburden The results of the geochemical analysis of the overburden and ore zone indicate that no elements occur at average or peak concentrations above Health based Investigation Levels (HILs) for commercial and industrial sites as described under Schedule B(1) of the National Environmental Protection Council (NEPC) Guideline on Investigation Levels for Soil and Groundwater. Sample analyses summaries in Table 4 were undertaken by ALS using inductively coupled plasma mass spectrometry (ICPMS) and by Andromeda staff using handheld x-ray fluorescence (HHXRF). ALS analysed 55 samples from 6 holes and Andromeda analysed 1184 samples from 47 holes as shown on Figure 4.

Table 4. **Commercial/industrial HILs compared to GW overburden and ore zone**

Element	Commercial/ industrial HIL (mg/kg)	Peak HHXRF assay (mg/kg)	Average HHXRF Whole rock (mg/kg)	Peak ICPMS assay (mg/kg)	Average ICPMS Whole rock (mg/kg)
Arsenic	3,000	35.23	2.04	17.6	2.3
Beryllium	500	NA*	NA*	1.54	0.45
Boron	300,000	NA*	NA*	25**	8.1**
Cadmium	800	45.94	2.10	0.057	0.036
Chromium	3000	319.47	15.73	100.5	23.9
Cobalt	4000	718.51	3.83	7.6	2.7
Copper	250,000	57.81	3.82	16.2	5
Lead	1500	405.66	15.43	393	26.1
Manganese	40,000	597.78	46.49	192	71
Mercury	200	11.5	0.07	NA*	NA*
Nickel	4,000	113.78	13.77	41.9	13.3
Selenium	10,000	11.08	0.06	5.45	0.46
Zinc	400,000	78.74	8.60	67.6	14.8

*NA Not analysed

**Boron by Rayment & Lyons 2011 - 12C2 (Hot CaCl2)

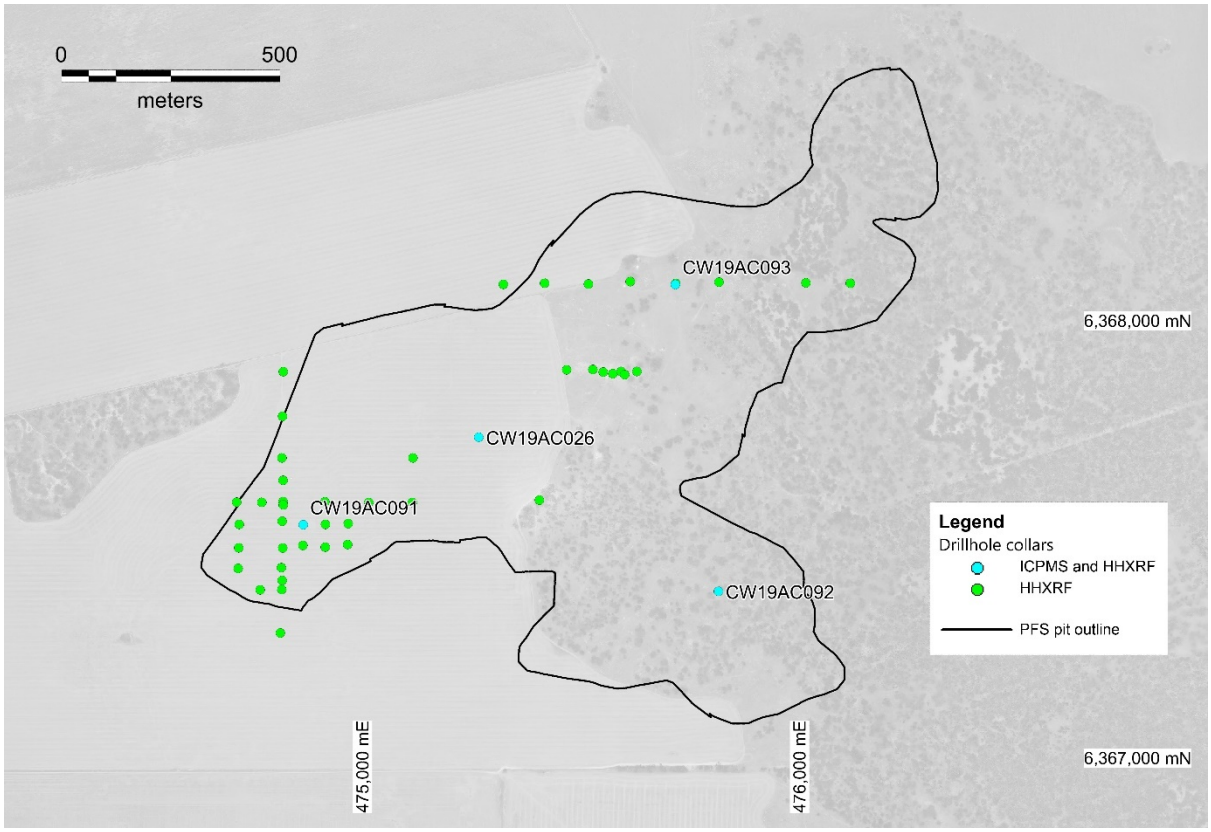

Figure 4: Collar locations of drillholes sampled for ICPMS and HHXRF analyses (GDA94 MGA Zone 53)

3. Great White Kaolin Project

The Project is proposed to comprise of a series of shallow connecting open pits, located close to the processing plant, to be mined sequentially in annual stages, Figure 5. Mining is planned to proceed sequentially in 200m by 200m cutbacks over 26 years from west to eastern. The pit design is very simple due to the shallow resource, with geometry being amenable to a manual interactive pit design .

The Project area is a greenfield development with the following site infrastructure items proposed to be constructed:

- Site and internal access roads
- Water control drains
- Area for run of mine (ROM) ore stockpiles
- Mining operations, administration, and maintenance facilities: office buildings, process plant workshop, store, reagent stores, assay laboratory, fuel stores, water supply pipeline, power station

3.1.1. Year 1 – 2 Pit

During years one and two the overburden will be deposited into the Integrated Overburden Landform (IOL). The dimensions of the Year 1-2 pit will be approximately 400 x 300m with a maximum depth below surface of 30m with the overburden waste rock estimated to be around 2,000,000 tonnes.

Based on the current mine schedule, a summary of estimated ore and overburden (waste rock) in the first two years of mining is shown in Table 5.

Table 5: GW Materials Balance

Year	Triangulation	Volume	Density	Tonnage
1	Soil	174,000	1.60	279,000
	Calcrete (Bridgewater Fm)	128,000	1.87	239,000
	Sand (Garford Fm)	388,000	1.54	597,000
	Ore	439,000	1.47	646,000
	Pit	1,129,000		1,761,000
2	Soil	104,000	1.60	167,000
	Calcrete (Bridgewater Fm)	103,000	1.87	192,000
	Sand (Garford Fm)	225,000	1.54	347,000
	Ore	505,000	1.47	742,000
	Pit	937,000		1,448,000

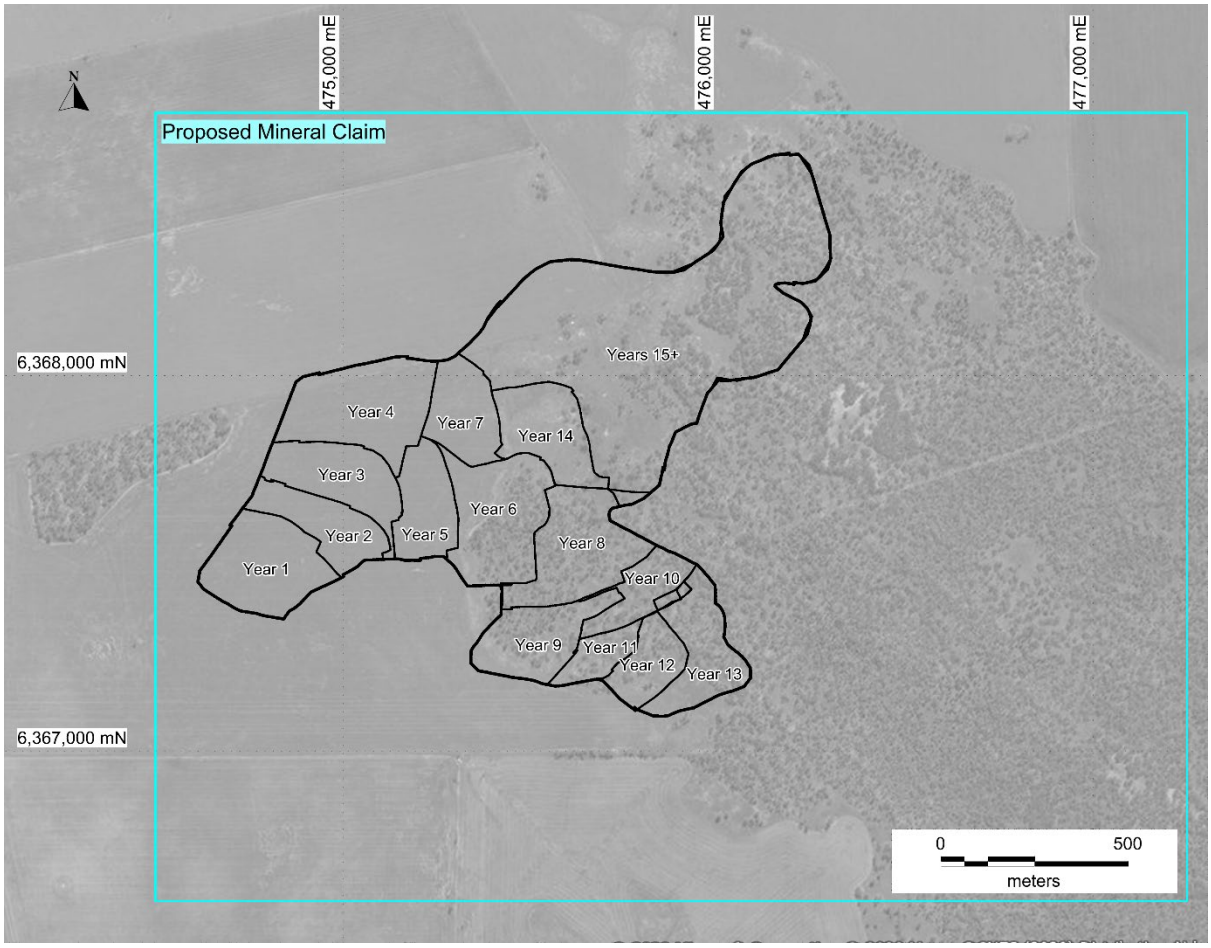

Figure 5: Great White annual sequence of pits to be mined (GDA94 MGA Zone 53)

The over overburden from the Year 1 and Year 2 pits will be formed into an integrated overburden landform (IOL), shown in Figure 6, Figure 7 and Figure 8.

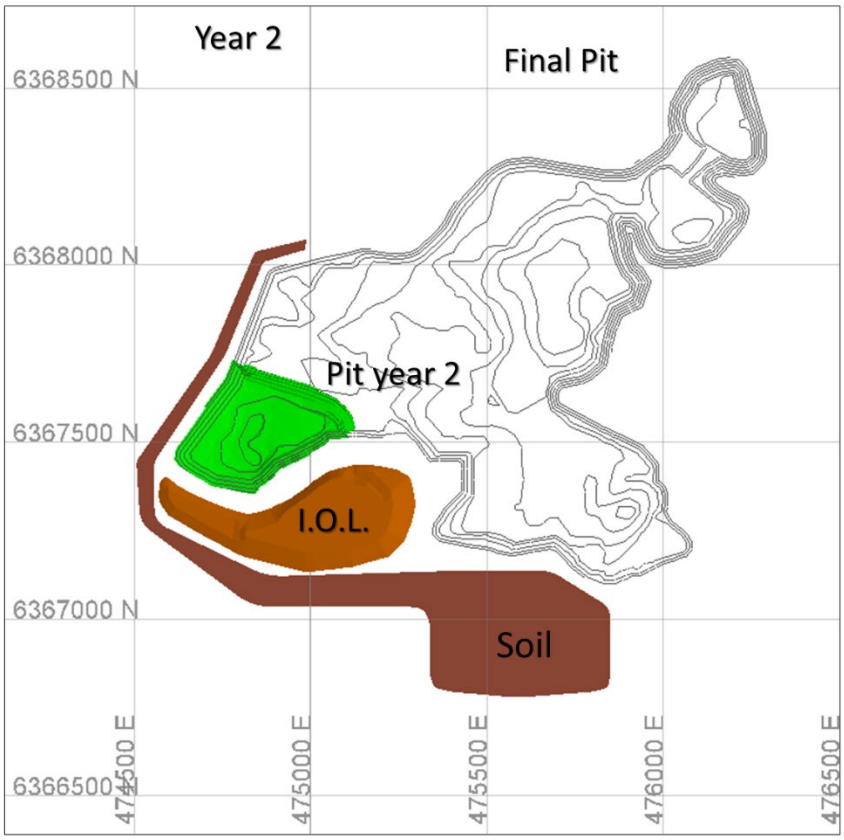

Figure 6: Year 2 design showing Year 1 and 2 pit, I.O.L. and soil stockpiles.

After year 2, overburden and extracted sands from the process plant are to be relocated into the existing mine-void progressively backfilling the mine void as shown in Figure 7 and Figure 8.

Production is envisaged to be managed by Andromeda and undertaken by an earthmoving contractor using excavators and trucks to haul ore and waste to respective stockpiles. It is envisaged that the in-situ material will be free digging, with exception of thin bands of calcrete rock near the surface and silcrete rock just above the kaolinized granite that may both require limited blasting.

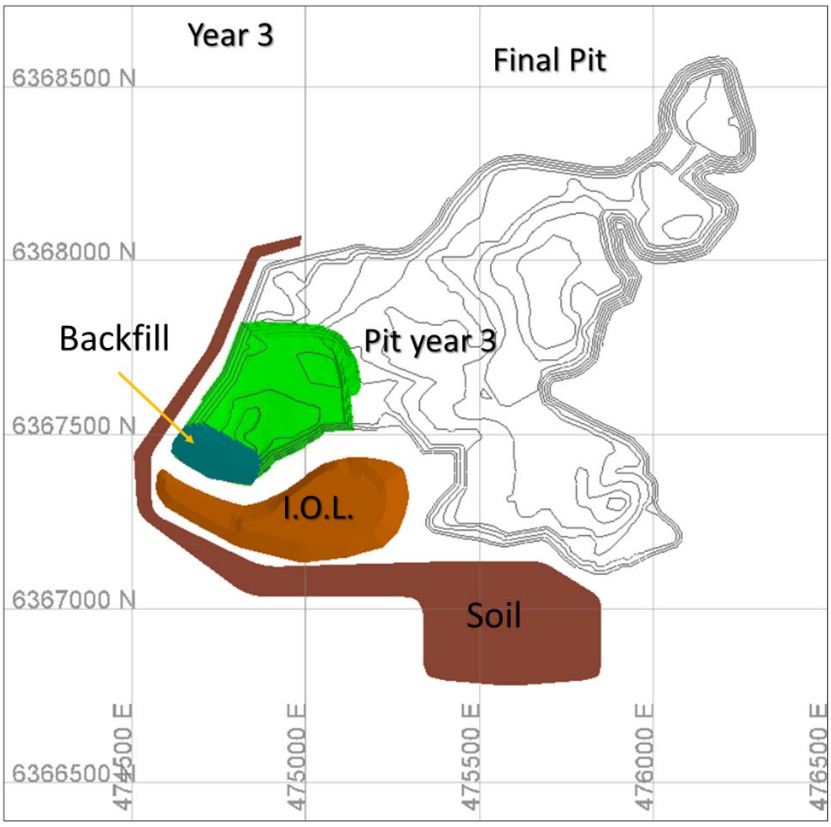

Figure 7: Year 3 surface disturbance and commencement of backfilling of mine void

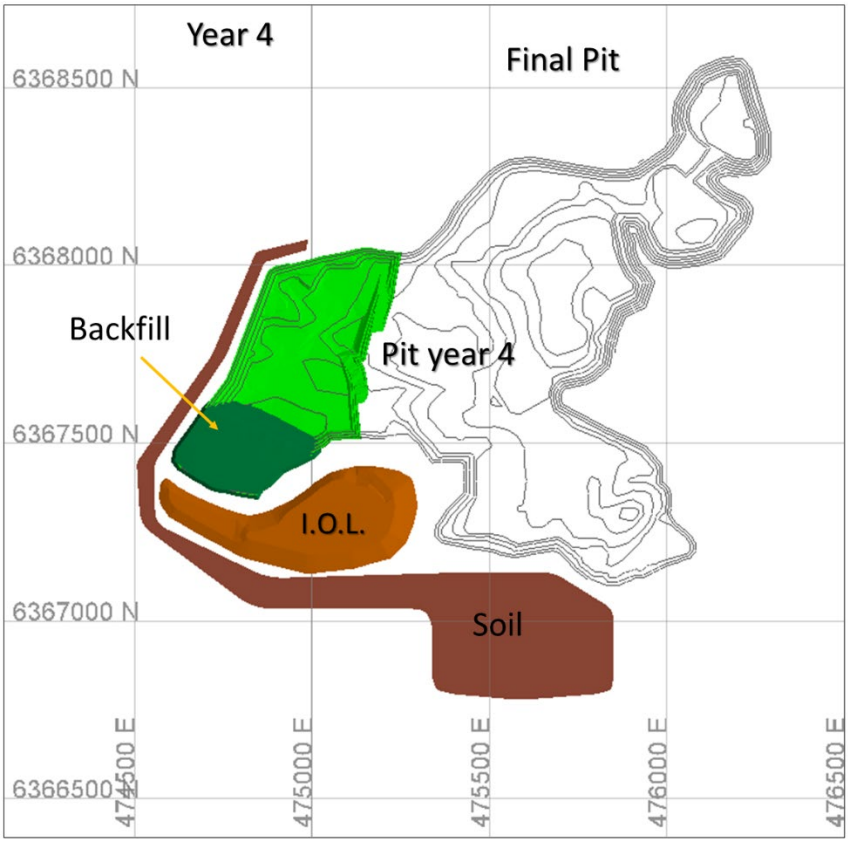

Figure 8: Year 4 surface disturbance showing progressive rehabilitation of mine void

4. Objectives and Methodology

4.1. Acid and Metalliferous Drainage Potential

Where sulfide minerals such as pyrite occur in mined rocks, there is potential for the generation of AMD. To assess the AMD possibility, a study was carried out to assess the potential for the creation of AMD.

The process of sulfide oxidation can result in the generation of sulfuric acid and can liberate metals, metalloids and salts into mine water. As a consequence, acidic mine waters are usually associated with elevated concentrations of sulfate, and one or more metals and metalloids.

When excess neutralising capacity is present in the oxidising environment, near-neutral pH values may be observed. However, concentrations of some metals and salinity may remain elevated, resulting in near-neutral metalliferous drainage (NMD).

This allows the PAF and NAF characteristics of country rock to be considered during mine planning and to ensure waste rock storage facilities will manage AMD risks.

4.2. Investigation Guidelines

The AMD assessment and analysis of laboratory results was conducted with reference to the following guiding documents:

- Department of Industry Tourism and Resources (2016) Leading Practice Sustainable Development Program for the Mining Industry. Preventing Acid and Metalliferous Drainage. Australian Government.
- EPA SA (2007) Site contamination - Acid Sulphate Soil materials. Publication EPA 638/07
- Environment Protection and Heritage Council and the Natural Resource Management Ministerial Council (2018) National guidance for the management of acid sulfate soils. Canberra, ACT. https://www.waterquality.gov.au/issues/acid-sulfate-soils/a-synthesis
- The International Network for Acid Prevention (INAP), 2009. Global Acid Rock Drainage Guide (GARD Guide)

4.3. AMD Characterisation Methods

The key aim of AMD classification is to enable the development of block models showing the distribution of AMD risk through the waste, ore and surrounding materials and groundwater. Characterisation of AMD involves a variety of screening and acid base accounting (ABA) techniques to determine the acidification hazard for material to be mined or disturbed during mining. At the screening stage the acidification hazard is presented by the pH of soil (or water) and by the net acid production potential (NAPP).

The NAPP is the difference between the maximum potential acidity (MPA) and the neutralisation capacity (ANC) of a rock or soil sample.

The MPA is determined by the stoichiometry and molar mass of pyrite oxidation in the presence of oxygen and water producing ferric hydroxide compounds and is typically calculated using the total

sulfur (Total S%) of a sample. The MPA assumes that all sulfur is present as pyrite (or an acidic oxidation product) and therefore generally represents a worst case estimate of the samples acid producing potential, as not all sulfide or sulfate minerals produce acid when oxidised dissolve, and not all sulfate minerals are a source of acidity.

Rock samples with a Total S%<0.1 would generally be classified as 'barren', and samples with Total S%<0.3 would generally be considered to present a low potential acidification risk, if managed appropriately during mining.

However, soil and groundwater acidification has been attributed in environments with extremely poor buffering capacity to very low reduced inorganic sulfur contents (S%<0.01), such as the Bassendean sands that surround Perth).

The ANC refers to the capacity of a rock or soil sample to keep the pH stable as acid is produced during oxidation of pyrite. The ANC of a rock or soil is determined by its carbonate content (calcium and magnesium), and to lesser extent aluminosilicate minerals. A negative NAPP indicates that the sample has a net neutralising capacity. A positive NAPP indicates the sample has a net acid-generating capacity.

The pH (pH of soil-water 1:5 solution or 1:2 paste) of a sample provides an indication of the acid-base nature of the sample. Samples having a slightly acidic pH (generally <5.5) is an indication that the sample has begun to oxidise, has limited ANC, and may contain absorbed/readily available acidity or stored acidity in the form of acidic oxidation products (e.g. secondary Fe/Al hydroxy sulfate minerals, such as jarosite, natrojarosite, schwertmannite, alunite and basaluminite).

Net acid generation (NAG) testing is used to measure the acid generation of a sulfidic sample by adding a strong oxidising agent (such as hydrogen peroxide) to a laboratory prepared sample, which is then allowed to react to completion before measuring the pH of the NAG liquor (final NAG pH).

If a sulfidic sample contains sufficient ANC that is readily available for buffering any sulfuric acid generated, the final NAG pH (or oxidised pH) will be circum-neutral or alkaline and the material is considered to be non-acid forming (NAF). A final NAG pH of 4.5 or less would confirm that sulfide oxidation would generate an excess of acidity (positive NAPP) and the material is therefore considered to be potentially acid forming (PAF).

At the initial stage of an AMD investigation, the MPA and final NAG pH (or oxidised pH) of a sample can be used to provide a preliminary AMD classification. The pH results can be used to screen samples for further ABA testing required to refine the AMD classifications and risk profile.

In this AMD assessment, the following assumptions have been used to classify the samples:

- NAG testing was not undertaken on the Great White samples as all samples were considered to be oxidised (are from an intense lateritic weathering profile) as they were from above the groundwater table. Under these oxidised conditions pHKCl or $pHCaCl_2$ is considered to be representative of the acidification hazard (for screening purposes).
- The MPA (calculated from Total S%) provides a worst-case estimate of the NAPP

- The ANC of all samples is negligible or in-effective on samples with a pH of less than 6.5 (assumed as a conservative measure in accordance with ASS Guidelines).

4.4. AMD Classification

The standard, static AMD testing methods used enable preliminary classification of samples as either:

- Potential acid forming (PAF)
- Potential acid forming – low capacity (PAF-LC)
- Non-Acid Forming (NAF)

Preliminary AMD testing methods may not always differentiate between PAF-LC and NAF material. Where this is the case materials are classified as 'uncertain (UC).

Soil samples with a pH1:5<4.0 would likely classify as actual ASS (AASS) or potential ASS (PASS) material.

4.5. Acid Base Accounted (ABA)

When acidic (sulfuric) or sulfidic AMD and ASS material are disturbed the acidity, they contain can cause leaching and mobilisation of oxidation by-products and metals to down gradient environments, in the presence of a hydraulic gradient. Therefore, for the assessment and management of AMD and ASS materials the hazard of most concern is usually the acidification hazard. Acid neutralising capacity can be present in the soil and may buffer against acidification (typically if fine limestone/calcareous material is present), however it is not always present in a readily available form. Therefore assessment criteria for AMD and ASS is based on an Acid Base Accounting (ABA) approach that subtracts a soils effective neutralising capacity from the total sources of acidity using Equation 1:

Equation 1 - Acid Base Accounting (ABA) approach:

$$\text{Net Acidity} = \text{Potential Sulfidic Acidity} + \text{Actual Acidity} + \text{Retained Acidity}^{\#} - \text{Acid Neutralising Capacity}^{*}$$

Best practice requires a precautionary, staged approach to determine the acidification hazard and management requirements. Net Acidity does not include ANC. Verification of the effectiveness of the ANC must be supported by other data before being considered for ABA classification and management. ANC is considered unavailable for any sample with a pH_{KCl}<6.5.

The ABA results are also used to classify ASS material types, which ultimately define the hazards associated with their disturbance.

5. AMD Sampling and Analysis Program

A total of 86 samples were selected by Andromeda for analysis from five drillholes completed in 2019 (prefixed CW19) and ten drillholes completed in 2020 (prefixed CW20). The intention of the sampling program was to obtain representative samples of country rock that; (i) reflected (as close as possible) the waste rock that would be generated during the mine life by targeting the depth intervals that intersect with the underground mine plan, and (ii) represent zones of potential AMD risk, highlighting areas to avoid or manage during mine planning (Table 6).

Table 6: Summary of sampling programs

Formation	Lith	Desc	pH average	CW19	CW20	All
Bridgewater Fm	CALC	Calcrete	8.4	6	1	7
Garford Fm	CL	Clay	6.5	1		1
	SACL	Sandy clay	6.4		3	3
	SILT	Silt	8.3	7		7
	SA	Sandy clay	7.1	10		10
	HAEM	Haematite nodules	5.5		1	1
	GRAV	Gravel	4.5	1		1
	SLCR	Silicified Garford Fm	7.9	2	1	3
Hiltaba Granite	SLKG	Silicified granite	7.7	3	3	6
	NPDG	Upper partially decomposed granite	7.3		9	9
	KG	Kaolinised granite	5.6	24	12	36
	PDG	Partially decomposed granite	5.4	1	1	2
Total				**55**	**31**	**86**

The CW20 drillhole samples are representative of material to be encountered in the Year 1 and Year 2 pits, and samples were selected to characterise material from these pits that will go into the Integrated Overburden Landform (IOL). All other waste (overburden) will be put back into the mining void. The CW20 sample testing was focused mainly on the waste material which is largely above the ore zone (kaolinised granite). Samples of ore grade white kaolinised granite and samples of internal waste (colour) kaolinised granite were also analysed. Full acid base accounting methods (Full Chromium Reducible Sulfur Suite) testing was undertaken for the CW20 samples in addition to Total S%. The CW19 samples are located are spread over a broader area than the CW20 samples as shown in Figure 9. AMD testing of CW19 samples, initially collected for geochemistry, was limited to Total S%, pHCaCl and Conductivity for AMD screening.

All samples were analysed by ALS Global who are National Association of Testing Authorities (NATA) accredited for the AMD analysis undertaken.

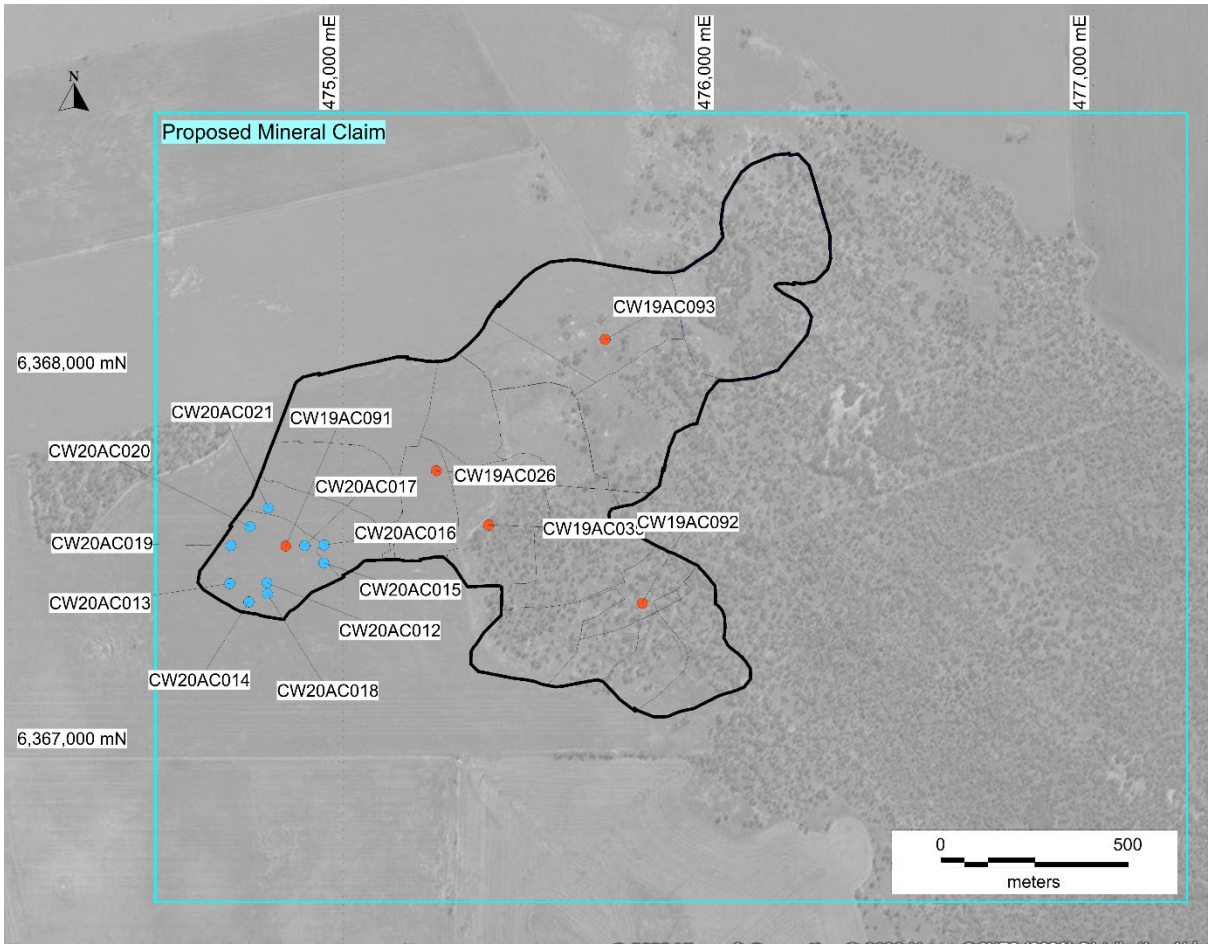

Figure 9. Collar locations drillholes sampled for AMD test work, orange 2019, blue 2020.

6. AMD Assessment

Results from field observation and AMD screening are summarised below. Complete results tables and laboratory reports are provided in Appendix 1.

6.1. Desktop Assessment

The National Acid Sulfate Soils Atlas (ASRIS) identifies near surface soils in the area as having an Extremely Low Probability of Acid Sulfate Soils occurrence, however the mapping confidence level is low and the ASS dataset does not typically consider conditions below 2 m depth. In some areas a 'podzol' profile may form where iron oxyhydroxides have been mobilised from the topsoil (A Horizon) and accumulated in the subsoil (B horizon) (Podsolization), which is an acid producing process.

6.2. AMD Screening Assessment

6.2.1. Existing Acidification Hazard

Surface soils at the site are typically shallow sandy loam on calcrete and shallow sand on calcrete. Near surface conditions from all boreholes tested were alkaline with pH results (Figure 10) ranging from 7.0 to 8.5) due to the calcareous landscape, indicating there is a very low risk of encountering actual ASS or acidic AMD within soils or calcareous material of the Bridgewater Formation.

CW20 samples from the Year 1 and Year 2 pit ranged from moderately acidic (pH 4.8) to strongly alkaline (pH 9.2) (Figure 10).

CW19 samples located more broadly in the Year 3 to Year 15+ pit contained a number of acidic (pH<4.5) samples that are likely to contain absorbed/readily available acidity or stored acidity in the form of acidic oxidation products (e.g. secondary Fe/Al hydroxy sulfate minerals).

Proportionally, the majority of acidic samples were from the finer textured, saline material (clay after granite) from below 15 m depth, where they are associated with saline acidic groundwater, however acidic material also occurs within sandy sediments of the Garford Formation.

The pH results indicate that moderately acidic materials from within the Year 1 to Year 2 pit may present an existing acidity hazard if unmanaged during mining.

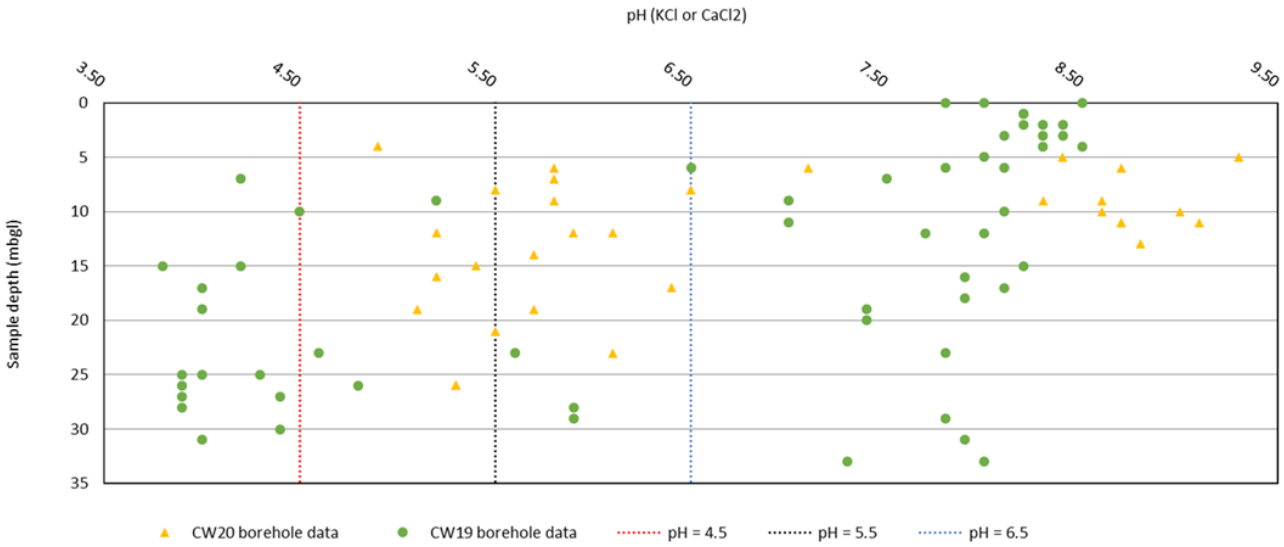

Figure 10: Sample depth vs pH results for all soil and rock samples tested

6.2.2. Maximum Potential Acidity (MPA)

Total S% results ranged from 0.01%S to 1.11%S, with an average of 0.11%S for the CW20 samples (Year 1 and Year 2 pit), and an average of 0.04%S for CW19 samples, which indicates a low to very low potential for the samples to acidify further, based on AMD and ASS classification criteria (Figure 11).

Rock and sediment samples with Total S<0.1% would generally be classified as 'barren' and samples with Total S<0.3% would generally be considered to present a low AMD risk, if managed appropriately during mining.

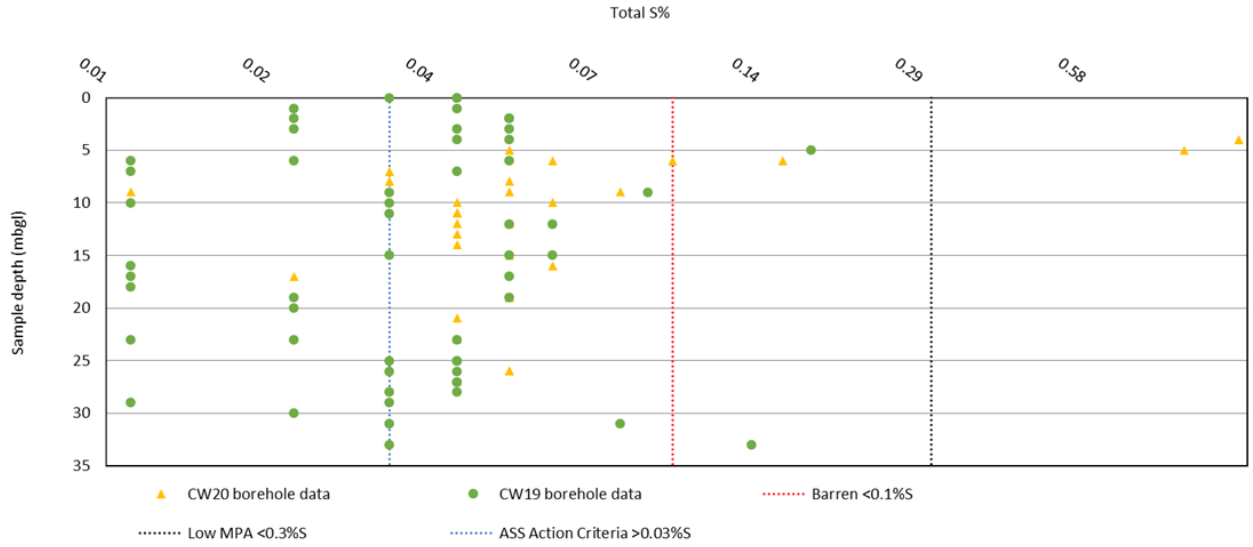

Figure 11: Maximum potential acidity hazard (MPA) with depth for all samples tested

When compared to sample depth, the MPA results in Figure 11 suggest the S% values (highest potential acidity risk) is present in near surface calcareous soils and sediments, however the sulfur is most likely to be present as gypsum (non-acid forming) in the soils and Bridgewater Formation.

MPA does not account for all forms of existing and stored acidity (e.g. acidic cations), or for the leaching of sulfur from the soil/regolith profile over time, which is why the MPA results do not correlate with the pH screening results. These additional forms of acidity are accounted for by acid base accounting (ABA) testing, which was undertaken on all CW20 samples.

6.2.3. Net Acid Producing Potential and AMD Classification

Net Acid Producing Potential (NAPP) is based on the difference between the MPA and ANC of a sample, expressed in units of kilograms of sulfuric acid per tonne (kg H_2SO_4/t). The potential for a sample to be NAPP positive (i.e. acid producing) or NAPP negative (acid consuming) is shown in (Figure 12). Not shown on the graph is the calcrete sample from CW20AC014 5-6m which has a NAPP value of -565.

All CW20 samples with a pH<6.5 plotted left of the NAPP=0 line and are therefore expected to be non-acid forming (NAF). The CW20 samples that plotted right of the NAPP=0 line plot in the upper right quadrant are classified as Uncertain (UC). UC samples with a pH 4.5>6.5 are likely to classify as PAF (upon further ABA analysis), but would be expected to have a 'low capacity' to release potential or actual acidity. Therefore, further ABA tests and sulfur speciation was undertaken to confirm the acid forming characteristics of CW20 samples (refer to Acid Base Accounting section below).

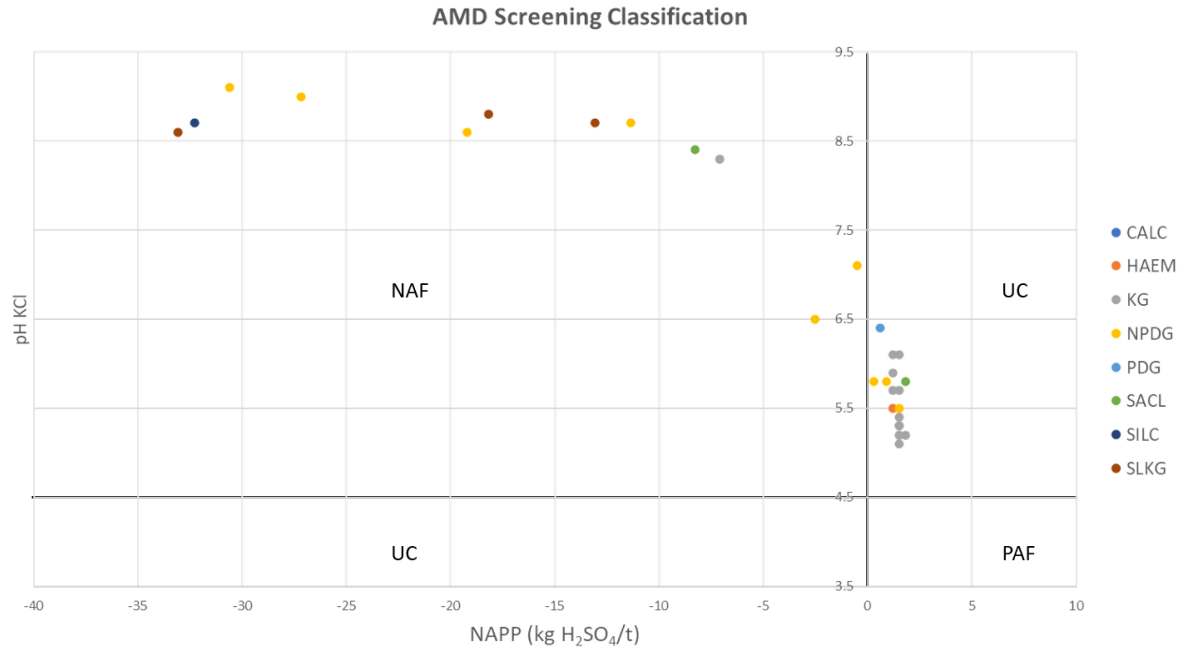

Figure 12: Classification plot showing pH KCl and estimated NAPP values based on available MPA – ANC data.

In order to provide an estimate of NAPP for CW19 samples in the absence of ANC results, could be assumed that ANC is negligible (worst case scenario) and therefore ANC = MPA. This assumption is supported for samples with a pH<6.5 where ANC is unlikely to effectively buffer acidity, however, this assumption has caused CW19 samples with a pH>6.5 to plot in the upper right UC quadrant.

Near-neutral and alkaline CW19 samples that plot in the UC quadrant would be expected to re-classify as NAF if ANC values were available for classification of CW19 samples, Figure 13. All slightly acidic to acidic samples (i.e. pH <6.5) are likely to have a 'low capacity' to release potential or actual acidity.

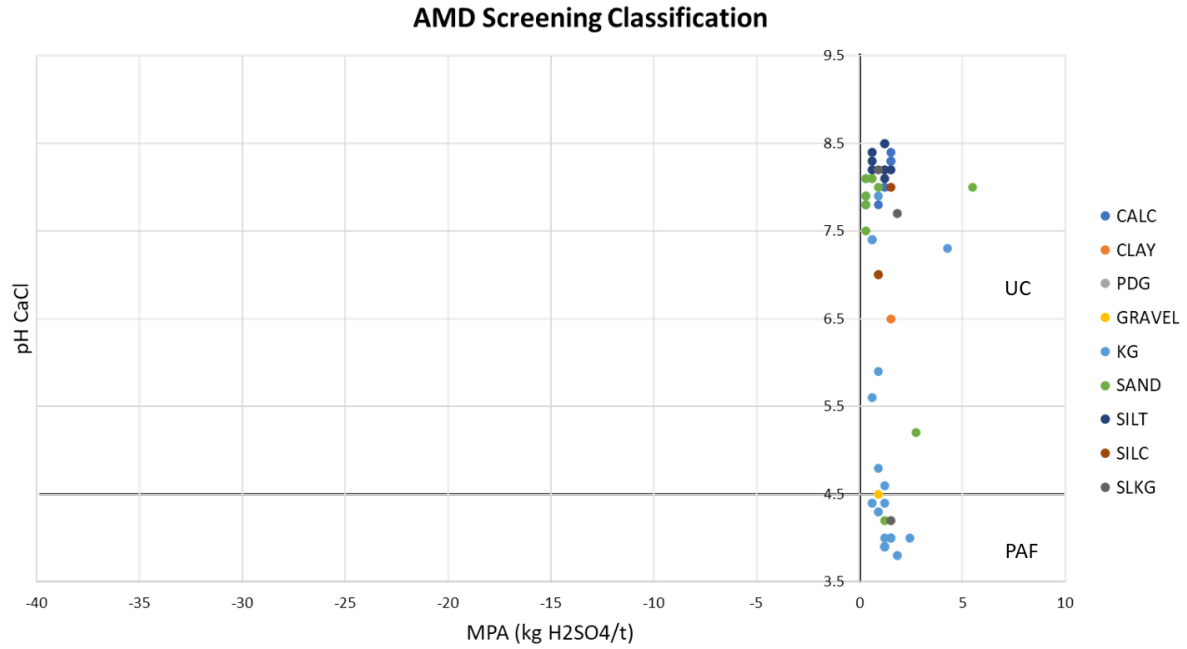

Figure 13: Classification plot showing pH (based on pH CaCl) and estimated NAPP values based on available MPA – ANC data.

6.3. Acid Base Accounted (ABA) Results – Year 1 and Year 2 Pit

ABA analysis (Chromium Reducible Suite) was undertaken on CW20 samples to refine the preliminary AMD classifications and identify the source of acidic rock and groundwater at the site.

The ABA results indicate that all samples have a low capacity to generate further acidity through the oxidation of pyrite, as reduced inorganic sulfur contents were below the ASS action criteria of 0.03%CRS for Total Potential Sulfidic Acidity (TPS) (Figure 14 and Figure 15). The ABA results show that the moderate acidity of some samples can be attributed to the Existing Acidity. Although only one sample exceeded the 0.3%CRS action criteria, it is likely that additional acidity (in the form of Retained Acidity) is present in moderately acidic samples.

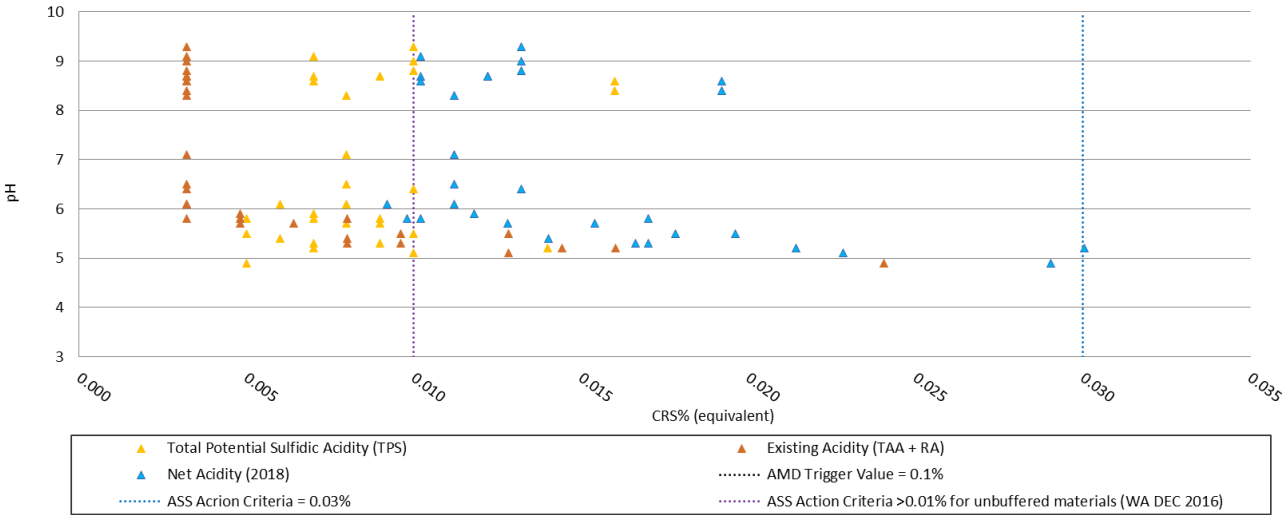

Figure 14: ABA analytical results vs bimodal distribution of pH (as pHKCl), compared to ASS and AMD assessment criteria

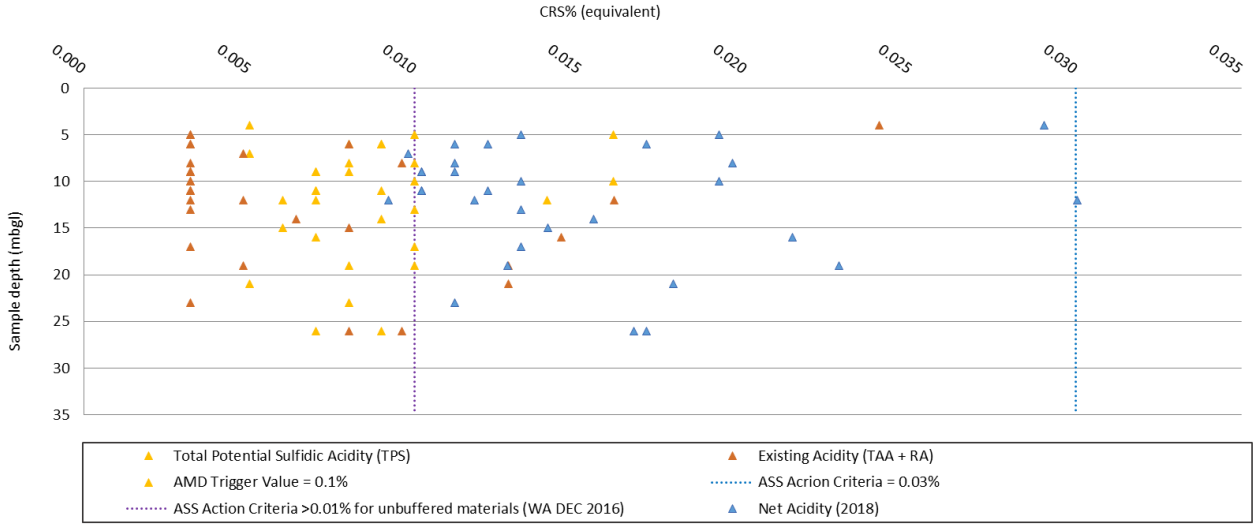

Figure 15: ABA analytical results vs depth compared to ASS and AMD assessment criteria

If analysis for Retained Acidity is undertaken, iron stained (Garford Formation) samples with a pHKCl<6.5 are likely to marginally exceed the 0.03%CRS assessment criteria. In naturally-occurring acidic soils, rock and groundwater acidity is not considered an environmental hazard that requires management, but represent acidophilic ecosystems whose health depends on maintaining the acidic environment.

6.4. Saline and Neutral Metalliferous Drainage (NMD) Potential

Neutral metalliferous drainage (NMD) refers to drainage that contains elevated dissolved and/or total metal concentrations and (sulfate) salinity. The relationship between sample EC and depth is shown in Figure 16 indicating the more saline samples are associated with the slightly acidic samples of the Garford Formation and kaolinised granite.

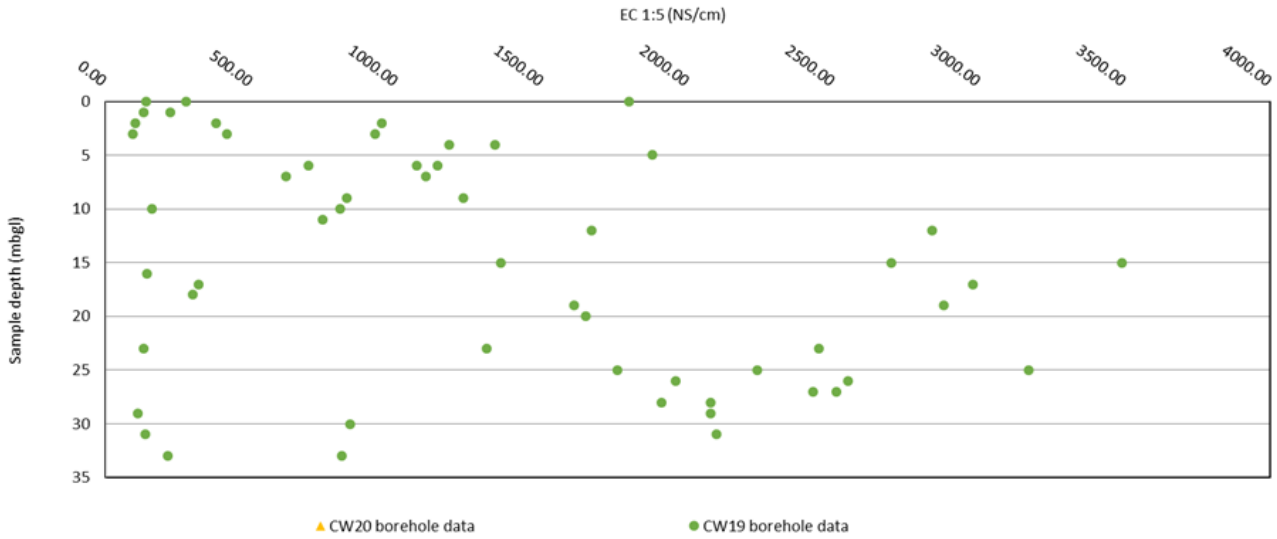

Figure 16: Relationship between sample EC and depth (CW20 samples were not tested for salinity)

7. Conclusion

The following conclusions are based on the AMD assessment undertaken:

- The surface soils across the site are typically shallow sandy loam on calcrete and shallow sand on calcrete, with a very low potential to generate AMD or NMD conditions
- Calcareous subsoils and calcrete materials of the Bridgewater Formation could provide a source of alkalinity for acid neutralisation and utilised to construct hard-stand pads beneath overburden and ROM stockpiles, bunds around overburden stockpiles and water storage dams
- The Year 1-2 Pit works at the Carey's Well site are unlikely to generate AMD materials; with all CW20 samples expected to be non-acid forming (NAF) or to have a 'low capacity' to release potential or actual acidity (PAF LC);
    - PAF LC materials primarily occur below 15 m depth in association with moderately acidic saline material of the Garford Formation and Hiltaba Granite
    - ABA analysis of PAF LC material from the Year 1-2 pit contain low Total Potential Sulfidic Acidity (TPS) which only marginally exceeded assessment criteria in one sample tested, however all moderately acidic saline material of the Garford Formation and Hiltaba Granite will require management to prevent leachate from impacting sensitive receptors
- Screening assessment results (CW19 samples) indicate that Post Year 1-2 pit works are likely to intercept acidic saline PAF material associated with the Garford Formation and Hiltaba Granite, and groundwater that will require management to prevent leachate from impacting sensitive receptors
- Retained Acidity was not determined during ABA analysis for this assessment because the pH <4.5 trigger value was not exceeded, but should be specifically requested during any future ABA analysis undertaken.

Overall, there is not considered to be a credible source of acidity, nor receptor to be able to be impacted by acid and/or metalliferous seepage from overburden stockpile.

8. References

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Appendix 1. 2019 ICPMS data

Hole ID	From	To	Lith	Sample ID	As (ppm)	Be (ppm)	Cd (ppm)	Co (ppm)	Cr (ppm)	Cs (ppm)	Mn (ppm)	Ni (ppm)	Pb (ppm)	Se (ppm)	Zn (ppm)	S (%)
CW19AC026	2	3	CALC	CW1001	3.72	0.54	0.048	5.67	20.4	1.23	154.5	11.45	6.25	0.218	28.2	0.05
CW19AC026	3	4	CALC	CW1002	3	0.47	0.047	5.3	18.4	1.03	127	9.65	5.5	0.17	33.6	0.05
CW19AC026	4	5	CALC	CW1003	3.95	0.41	0.042	7.1	15.3	0.88	102	8.12	4.87	0.154	29.6	0.05
CW19AC026	5	6	SA	CW1004	2.88	0.86	<0.005	1.77	15.4	1.52	58.9	8.8	30.7	0.317	67.6	0.18
CW19AC026	6	7	CL	CW1005	4.55	0.51	<0.005	3.77	30.9	1.82	59.8	10.75	11.6	0.917	15.1	0.05
CW19AC026	7	8	SA	CW1006	6.53	0.27	<0.005	3.85	37.7	1.67	48.9	9.3	6.28	0.637	10.4	0.04
CW19AC026	9	10	SA	CW1007	17.6	0.3	<0.005	2.65	100.5	0.93	24.1	9.25	11.7	2.08	7.3	0.09
CW19AC026	10	11	GRAV	CW1008	1.59	0.22	<0.005	2.06	28.3	0.68	44.3	18.75	11.95	0.258	8	0.03
CW19AC026	11	12	SLCR	CW1009	2.06	0.22	0.015	3.24	60.7	0.87	48.7	41.9	6.64	0.213	11.1	0.03
CW19AC026	12	13	SLCR	CW1010	2.51	0.34	<0.005	2.5	21.9	0.46	47.7	7.46	5.34	0.339	65	0.05
CW19AC026	15	16	SLKG	CW1011	0.37	0.39	<0.005	0.603	13.8	0.3	35.7	10.75	4.37	0.069	9.1	0.05
CW19AC026	17	18	KG	CW1012	0.44	0.4	<0.005	0.787	17.1	0.25	45	13.35	2.57	0.076	7.6	0.05
CW19AC026	19	20	KG	CW1013	0.37	0.38	<0.005	0.671	14	0.31	43.7	11.3	3.77	0.225	9.8	0.05
CW19AC026	25	26	KG	CW1014	0.21	0.44	<0.005	0.466	14.3	0.76	47	13.25	11.35	0.78	8	0.04
CW19AC026	26	27	KG	CW1015	0.29	0.46	<0.005	0.651	19.5	0.94	48.8	16.5	15.4	0.803	8.4	0.04
CW19AC026	30	31	KG	CW1016	0.39	0.33	<0.005	1.02	34.8	1.01	59.7	31.6	12.75	0.224	7.3	0.02
CW19AC035	0	1	SILT	CW1017	2.13	0.54	0.034	3.52	16	0.98	100.5	9.91	12.9	0.212	14.9	0.04
CW19AC035	4	5	CALC	CW1018	5.48	0.46	0.02	5.11	17.2	0.89	68.4	8.31	7.8	0.112	8.5	0.04
CW19AC035	6	7	SA	CW1019	2.55	0.16	<0.005	1.745	18.4	0.79	42.3	6.31	3.04	0.516	6.9	0.02
CW19AC035	9	10	SA	CW1020	7.24	0.21	<0.005	1.545	35.5	0.72	36.2	6.79	5.19	0.829	7.3	0.03
CW19AC035	15	16	SLKG	CW1021	1.93	0.53	<0.005	2.47	35.5	0.67	50.9	24.1	16.1	0.212	24.2	0.03
CW19AC035	23	24	KG	CW1022	0.41	0.6	<0.005	0.809	21.8	0.98	67.9	16.85	14.1	0.131	12.4	0.04
CW19AC035	25	26	KG	CW1023	0.66	0.58	<0.005	0.341	10.5	1.07	54.8	7.69	28.6	0.267	6.2	0.03
CW19AC035	26	27	KG	CW1024	0.53	0.53	<0.005	0.775	23.8	1.15	71.5	18.85	25	0.351	8.7	0.03
CW19AC035	27	28	KG	CW1025	0.62	0.6	<0.005	0.586	12.2	1.17	65.3	8.68	24	0.592	7.2	0.04

Hole ID	From	To	Lith	Sample ID	As (ppm)	Be (ppm)	Cd (ppm)	Co (ppm)	Cr (ppm)	Cs (ppm)	Mn (ppm)	Ni (ppm)	Pb (ppm)	Se (ppm)	Zn (ppm)	S (%)
CW19AC035	28	29	KG	CW1026	0.52	0.71	<0.005	0.329	11.1	1.28	45	8.71	27.6	1.14	16.8	0.03
CW19AC035	29	30	GRAN	CW1027	0.5	1.54	<0.005	0.532	13.6	1.1	48.5	9.71	26	5.45	17.3	0.03
CW19AC091	12	13	SLKG	CW1028	0.75	0.27	<0.005	1.21	8.1	0.18	50.4	3.84	71.4	0.608	18.7	0.06
CW19AC091	15	16	KG	CW1029	1.31	0.46	<0.005	1.48	25.7	0.21	35.8	22.4	393	0.36	21.9	0.06
CW19AC091	25	26	KG	CW1030	0.63	0.36	<0.005	1.06	27.3	0.3	94.4	19.05	11.2	0.2	5.9	0.04
CW19AC091	27	28	KG	CW1031	0.55	0.5	<0.005	0.968	24.2	1	84.1	17.8	26.2	0.094	6.1	0.04
CW19AC091	28	29	KG	CW1032	0.46	0.45	<0.005	0.434	15.6	1.3	78.4	13	40.2	0.089	7.5	0.04
CW19AC091	31	32	KG	CW1033	0.58	0.41	<0.005	0.732	22.9	0.8	97.2	17.55	67	0.251	11.7	0.08
CW19AC092	0	1	CALC	CW1034	4.22	0.69	0.031	7.6	27	1.77	192	14.6	7.66	0.156	40.8	0.03
CW19AC092	1	2	SILT	CW1035	2.31	0.2	0.017	2.64	10.5	0.4	49	4.18	2.53	0.058	8.3	0.02
CW19AC092	2	3	SILT	CW1036	2.5	0.16	0.016	2.69	11.2	0.28	60.4	4.27	3.01	0.064	7.2	0.02
CW19AC092	3	4	SILT	CW1037	2.17	0.23	0.012	2.81	15.2	0.5	53.7	4.17	3.01	0.057	17.2	0.02
CW19AC092	6	7	SA	CW1038	4.68	0.58	<0.005	5.67	37.4	1.83	44	13.8	7.26	0.097	11.7	0.01
CW19AC092	7	8	SA	CW1039	6.76	0.6	<0.005	6.55	48.7	2.5	38.8	17.9	8.53	0.122	12.5	0.01
CW19AC092	19	20	KG	CW1040	0.54	0.47	<0.005	1.7	20.4	0.22	46.4	14.35	112.5	0.095	16.6	0.02
CW19AC092	20	21	KG	CW1041	0.93	0.6	<0.005	1.94	46.1	0.46	59.2	35.3	123	0.112	15.5	0.02
CW19AC092	23	24	KG	CW1042	0.99	0.57	<0.005	1.36	29.3	0.29	50.3	19.2	53.8	0.125	12.6	0.02
CW19AC092	33	34	SA	CW1043	1.13	0.52	<0.005	1.205	20.5	0.84	77.7	13.2	37.8	0.302	9.9	0.03
CW19AC093	0	1	CALC	CW1044	2.73	0.3	0.035	4.57	14.8	0.64	113.5	8.99	4.58	0.132	13.5	0.04
CW19AC093	1	2	SILT	CW1045	2.99	0.27	0.043	3.83	16.4	0.51	88.4	7.64	3.41	0.128	14.6	0.04
CW19AC093	2	3	SILT	CW1046	3.82	0.2	0.046	2.87	14.7	0.35	54.4	4.11	2.63	0.095	29	0.05
CW19AC093	3	4	SILT	CW1047	3.14	0.14	0.031	2.55	9.9	0.25	37.2	3.1	1.86	0.081	15.6	0.04
CW19AC093	10	11	SA	CW1048	5.82	0.26	<0.005	2.3	42.6	0.86	32.8	9.47	5.41	0.421	7.2	0.01
CW19AC093	16	17		CW1049	0.53	0.08	<0.005	0.835	10.6	0.19	50.7	4.85	1.72	0.084	4.6	0.01
CW19AC093	17	18		CW1050	1.18	0.43	<0.005	2.12	24.4	0.43	28	12.85	31.7	0.239	20.1	0.01
CW19AC093	18	19		CW1051	0.6	0.42	<0.005	1.675	23	0.31	46.3	14.1	21.1	0.134	15.2	0.01
CW19AC093	23	24		CW1052	0.26	0.52	<0.005	1.465	18.7	0.16	51.5	12	47.2	0.087	14.9	0.01

Hole ID	From	To	Lith	Sample ID	As (ppm)	Be (ppm)	Cd (ppm)	Co (ppm)	Cr (ppm)	Cs (ppm)	Mn (ppm)	Ni (ppm)	Pb (ppm)	Se (ppm)	Zn (ppm)	S (%)
CW19AC093	29	30		CW1053	0.21	0.79	<0.005	0.744	32.6	0.26	37.7	22.9	73.6	0.241	5.9	0.01
CW19AC093	31	32	KG	CW1054	0.81	0.51	<0.005	1.415	54.8	0.48	60.7	39.5	95.9	2.02	4.9	0.03
CW19AC093	33	34	KG	CW1055	0.99	0.63	<0.005	1.06	48.5	0.66	60.2	35.3	38.6	3.06	4.1	0.14

Appendix 2. CW19 AMD analyses

Hole ID	From	To	Sample ID	Lith code	Lith	*Compound CAS Number LOR Unit*	EA001: pH in soil using 0.01M CaCl extract	EA010: Conductivity (1:5) Electrical Conductivity @ 25°C
	(m)	(m)					0.1 pH Unit	1 NS/cm
CW19AC026	2	3	CW1001	CALC	Calcrete	EM2006699-001	8.3	949
CW19AC026	3	4	CW1002	CALC	Calcrete	EM2006699-002	8.4	926
CW19AC026	4	5	CW1003	CALC	Calcrete	EM2006699-003	8.3	1180
CW19AC026	5	6	CW1004	SA	Sand	EM2006699-004	8.0	1880
CW19AC026	6	7	CW1005	CL	Clay	EM2006699-005	6.5	1140
CW19AC026	7	8	CW1006	SA	Sand	EM2006699-006	4.2	1100
CW19AC026	9	10	CW1007	SA	Sand	EM2006699-007	5.2	1230
CW19AC026	10	11	CW1008	GRAV	Gravel	EM2006699-008	4.5	807
CW19AC026	11	12	CW1009	SLCR	Silcrete	EM2006699-009	7.0	746
CW19AC026	12	13	CW1010	SLCR	Silicified granite	EM2006699-010	8.0	1670
CW19AC026	15	16	CW1011	SLKG	Clay after granite	EM2006699-011	4.2	3490
CW19AC026	17	18	CW1012	KG	Clay after granite	EM2006699-012	4.0	2980
CW19AC026	19	20	CW1013	KG	Clay after granite	EM2006699-013	4.0	2880
CW19AC026	25	26	CW1014	KG	Clay after granite	EM2006699-014	3.9	3170
CW19AC026	26	27	CW1015	KG	Clay after granite	EM2006699-015	3.9	2550
CW19AC026	30	31	CW1016	KG	Clay after granite	EM2006699-016	4.4	841
CW19AC035	0	1	CW1017	SILT	Silt	EM2006699-017	8.5	1800

Hole ID	From	To	Sample ID	Lith code	Lith	*Compound CAS Number LOR Unit*	EA001: pH in soil using 0.01M CaCl extract	EA010: Conductivity (1:5) Electrical Conductivity @ 25°C
	(m)	(m)					0.1 pH Unit	1 NS/cm
CW19AC035	4	5	CW1018	CALC	Calcrete	EM2006699-018	8.5	1340
CW19AC035	6	7	CW1019	SA	Sand	EM2006699-019	8.1	1070
CW19AC035	9	10	CW1020	SA	Sand	EM2006699-020	7.0	830
CW19AC035	15	16	CW1021	SLKG	Silicified granite	EM2006699-021	8.2	1360
CW19AC035	23	24	CW1022	KG	Clay after granite	EM2006699-022	4.6	2450
CW19AC035	25	26	CW1023	KG	Clay after granite	EM2006699-023	4.3	1760
CW19AC035	26	27	CW1024	KG	Clay after granite	EM2006699-024	4.8	1960
CW19AC035	27	28	CW1025	KG	Clay after granite	EM2006699-025	4.4	2510
CW19AC035	28	29	CW1026	KG	Clay after granite	EM2006699-026	5.9	2080
CW19AC035	29	30	CW1027	GRAN	Granite	EM2006699-027	4.3	1880
CW19AC091	12	13	CW1028	SLKG	Silicified granite	EM2006699-028	7.7	2840
CW19AC091	15	16	CW1029	KG	Clay after granite	EM2006699-029	3.8	2700
CW19AC091	25	26	CW1030	KG	Clay after granite	EM2006699-030	4.0	2240
CW19AC091	27	28	CW1031	KG	Clay after granite	EM2006699-031	3.9	2430
CW19AC091	28	29	CW1032	KG	Clay after granite	EM2006699-032	3.9	1910
CW19AC091	31	32	CW1033	KG	Clay after granite	EM2006699-033	4.0	2100
CW19AC092	0	1	CW1034	CALC	Calcrete	EM2006699-034	7.8	278
CW19AC092	1	2	CW1035	SILT	Silt	EM2006699-035	8.2	223
CW19AC092	2	3	CW1036	SILT	Silt	EM2006699-036	8.4	382

Hole ID	From	To	Sample ID	Lith code	Lith	*Compound CAS Number LOR Unit*	EA001: pH in soil using 0.01M CaCl extract	EA010: Conductivity (1:5) Electrical Conductivity @ 25°C
	(m)	(m)					0.1 pH Unit	1 NS/cm
CW19AC092	3	4	CW1037	SILT	Silt	EM2006699-037	8.3	419
CW19AC092	6	7	CW1038	SA	Sand	EM2006699-038	7.8	699
CW19AC092	7	8	CW1039	SA	Sand	EM2006699-039	7.5	621
CW19AC092	19	20	CW1040	KG	Clay after granite	EM2006699-040	7.4	1610
CW19AC092	20	21	CW1041	KG	Clay after granite	EM2006699-041	7.4	1650
CW19AC092	23	24	CW1042	KG	Clay after granite	EM2006699-042	5.6	1310
CW19AC092	33	34	CW1043	SA	Sand	EM2006699-043	8.0	813
CW19AC093	0	1	CW1044	CALC	Calcrete	EM2006699-044	8.0	141
CW19AC093	1	2	CW1045	SILT	Silt	EM2006699-045	8.2	131
CW19AC093	2	3	CW1046	SILT	Silt	EM2006699-046	8.2	105
CW19AC093	3	4	CW1047	SILT	Silt	EM2006699-047	8.1	95
CW19AC093	10	11	CW1048	SA	Sand	EM2006699-048	8.1	162
CW19AC093	16	17	CW1049	SA	Sand	EM2006699-049	7.9	145
CW19AC093	17	18	CW1050	KG	Clay after granite	EM2006699-050	8.1	321
CW19AC093	18	19	CW1051	KG	Clay after granite	EM2006699-051	7.9	300
CW19AC093	23	24	CW1052	KG	Clay after granite	EM2006699-052	7.8	133
CW19AC093	29	30	CW1053	KG	Clay after granite	EM2006699-053	7.8	111
CW19AC093	31	32	CW1054	KG	Clay after granite	EM2006699-054	7.9	137
CW19AC093	33	34	CW1055	KG	Clay after granite	EM2006699-055	7.3	214

Appendix 3. CW20 AMD analyses

CW20 analyses				*EA033-A: Actual Acidity*			*EA033-B: Potential Acidity*		*EA033-C: Acid Neutralising Capacity*		
				pH KCl (23A)	Titratable Actual Acidity (23F)	sulfidic - Titratable Actual Acidity (s-23F)	Chromium Reducible Sulfur (22B)	acidity - Chromium Reducible Sulfur (a-22B)	Acid Neutralising Capacity (19A2)	acidity - Acid Neutralising Capacity (a-19A2)	sulfidic - Acid Neutralising Capacity (s-19A2)
Hole	From (m)	To (m)	Lith 1	pH Unit	mole H+ / t	% pyrite S	% S	mole H+ / t	% CaCO3	mole H+ / t	% pyrite S
				0.1	2	0.02	0.005	10	0.01	10	0.01
CW20AC012	8	9	NPDG	6.5	<2	<0.02	0.008	<10	0.35	71	0.11
CW20AC012	12	13	KG	5.2	10	<0.02	0.014	<10	----	----	----
CW20AC012	19	20	KG	5.1	8	<0.02	0.010	<10	----	----	----
CW20AC012	26	27	KG	5.3	5	<0.02	0.009	<10	----	----	----
CW20AC013	12	13	KG	6.1	<2	<0.02	0.006	<10	----	----	----
CW20AC013	15	16	KG	5.4	5	<0.02	0.006	<10	----	----	----
CW20AC014	5	6	CALC	9.3	<2	<0.02	0.010	<10	60.4	12100	19.4
CW20AC014	11	12	SLKG	8.7	<2	<0.02	0.009	<10	1.46	291	0.47
CW20AC014	17	18	PDG	6.4	<2	<0.02	0.010	<10	----	----	----
CW20AC015	10	11	NPDG	9.0	<2	<0.02	0.010	<10	2.96	591	0.95
CW20AC015	11	12	NPDG	9.1	<2	<0.02	0.007	<10	3.25	649	1.04
CW20AC015	23	24	KG	6.1	<2	<0.02	0.008	<10	----	----	----
CW20AC016	9	10	NPDG	5.8	<2	<0.02	0.007	<10	----	----	----
CW20AC016	13	14	SLKG	8.8	<2	<0.02	0.010	<10	1.98	396	0.63
CW20AC016	26	27	KG	5.3	6	<0.02	0.007	<10	----	----	----
CW20AC017	7	8	NPDG	5.8	3	<0.02	<0.005	<10	----	----	----

CW20 analyses				*EA033-A: Actual Acidity*			*EA033-B: Potential Acidity*		*EA033-C: Acid Neutralising Capacity*		
				pH KCl (23A)	Titratable Actual Acidity (23F)	sulfidic - Titratable Actual Acidity (s-23F)	Chromium Reducible Sulfur (22B)	acidity - Chromium Reducible Sulfur (a-22B)	Acid Neutralising Capacity (19A2)	acidity - Acid Neutralising Capacity (a-19A2)	sulfidic - Acid Neutralising Capacity (s-19A2)
Hole	From (m)	To (m)	Lith 1	pH Unit	mole H+ / t	% pyrite S	% S	mole H+ / t	% CaCO3	mole H+ / t	% pyrite S
				0.1	2	0.02	0.005	10	0.01	10	0.01
CW20AC017	11	12	SILC	8.7	<2	<0.02	0.007	<10	3.42	683	1.10
CW20AC017	19	20	KG	5.7	3	<0.02	0.008	<10	----	----	----
CW20AC018	6	7	SACL	5.8	5	<0.02	0.009	<10	----	----	----
CW20AC018	10	11	SLKG	8.6	<2	<0.02	0.016	<10	3.50	698	1.12
CW20AC018	16	17	KG	5.2	9	<0.02	0.007	<10	----	----	----
CW20AC019	6	7	NPDG	8.7	<2	<0.02	0.009	<10	1.47	293	0.47
CW20AC019	9	10	NPDG	8.6	<2	<0.02	0.007	<10	2.21	442	0.71
CW20AC019	12	13	KG	5.9	3	<0.02	0.007	<10	----	----	----
CW20AC019	21	22	HAEM	5.5	8	<0.02	<0.005	<10	----	----	----
CW20AC020	4	5	SACL	4.9	15	0.02	<0.005	<10	----	----	----
CW20AC020	6	7	NPDG	7.1	<2	<0.02	0.008	<10	0.55	109	0.18
CW20AC020	8	9	NPDG	5.5	6	<0.02	0.010	<10	----	----	----
CW20AC021	5	6	SACL	8.4	<2	<0.02	0.016	<10	1.00	200	0.32
CW20AC021	9	10	KG	8.3	<2	<0.02	0.008	<10	0.88	175	0.28
CW20AC021	14	15	KG	5.7	4	<0.02	0.009	<10	----	----	----

CW20 analyses				*EA033-E: Acid Base Accounting*							*ED042T: Total Sulfur by LECO*
				ANC Fineness Factor	Net Acidity (sulfur units)	Net Acidity (acidity units)	Liming Rate	Net Acidity excluding ANC (sulfur units)	Net Acidity excluding ANC (acidity units)	Liming Rate excluding ANC	Sulfur - Total as S (LECO)
Hole	From (m)	To (m)	Lith 1		% S	mole H+ / t	kg CaCO3/t	% S	mole H+ / t	kg CaCO3/t	%
				0.5	0.02	10	1	0.02	10	1	0.01
CW20AC012	8	9	NPDG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.03
CW20AC012	12	13	KG	1.5	0.03	18	1	0.03	18	1	0.05
CW20AC012	19	20	KG	1.5	0.02	14	1	0.02	14	1	0.05
CW20AC012	26	27	KG	1.5	<0.02	10	<1	<0.02	10	<1	0.05
CW20AC013	12	13	KG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.05
CW20AC013	15	16	KG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.05
CW20AC014	5	6	CALC	1.5	<0.02	<10	<1	<0.02	<10	<1	0.88
CW20AC014	11	12	SLKG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.04
CW20AC014	17	18	PDG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.02
CW20AC015	10	11	NPDG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.06
CW20AC015	11	12	NPDG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.04
CW20AC015	23	24	KG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.04
CW20AC016	9	10	NPDG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.01
CW20AC016	13	14	SLKG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.04
CW20AC016	26	27	KG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.05
CW20AC017	7	8	NPDG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.03
CW20AC017	11	12	SILC	1.5	<0.02	<10	<1	<0.02	<10	<1	0.04
CW20AC017	19	20	KG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.05
CW20AC018	6	7	SACL	1.5	<0.02	11	<1	<0.02	11	<1	0.06
CW20AC018	10	11	SLKG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.04
CW20AC018	16	17	KG	1.5	0.02	13	1	0.02	13	1	0.06
CW20AC019	6	7	NPDG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.10
CW20AC019	9	10	NPDG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.08

CW20 analyses				*EA033-E: Acid Base Accounting*							*ED042T: Total Sulfur by LECO*
				ANC Fineness Factor	Net Acidity (sulfur units)	Net Acidity (acidity units)	Liming Rate	Net Acidity excluding ANC (sulfur units)	Net Acidity excluding ANC (acidity units)	Liming Rate excluding ANC	Sulfur - Total as S (LECO)
Hole	From (m)	To (m)	Lith 1		% S	mole H+ / t	kg CaCO3/t	% S	mole H+ / t	kg CaCO3/t	%
				0.5	0.02	10	1	0.02	10	1	0.01
CW20AC019	12	13	KG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.04
CW20AC019	21	22	HAEM	1.5	<0.02	<10	<1	<0.02	<10	<1	0.04
CW20AC020	4	5	SACL	1.5	0.02	15	1	0.02	15	1	1.11
CW20AC020	6	7	NPDG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.16
CW20AC020	8	9	NPDG	1.5	<0.02	12	<1	<0.02	12	<1	0.05
CW20AC021	5	6	SACL	1.5	<0.02	<10	<1	<0.02	<10	<1	0.05
CW20AC021	9	10	KG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.05
CW20AC021	14	15	KG	1.5	<0.02	<10	<1	<0.02	<10	<1	0.04

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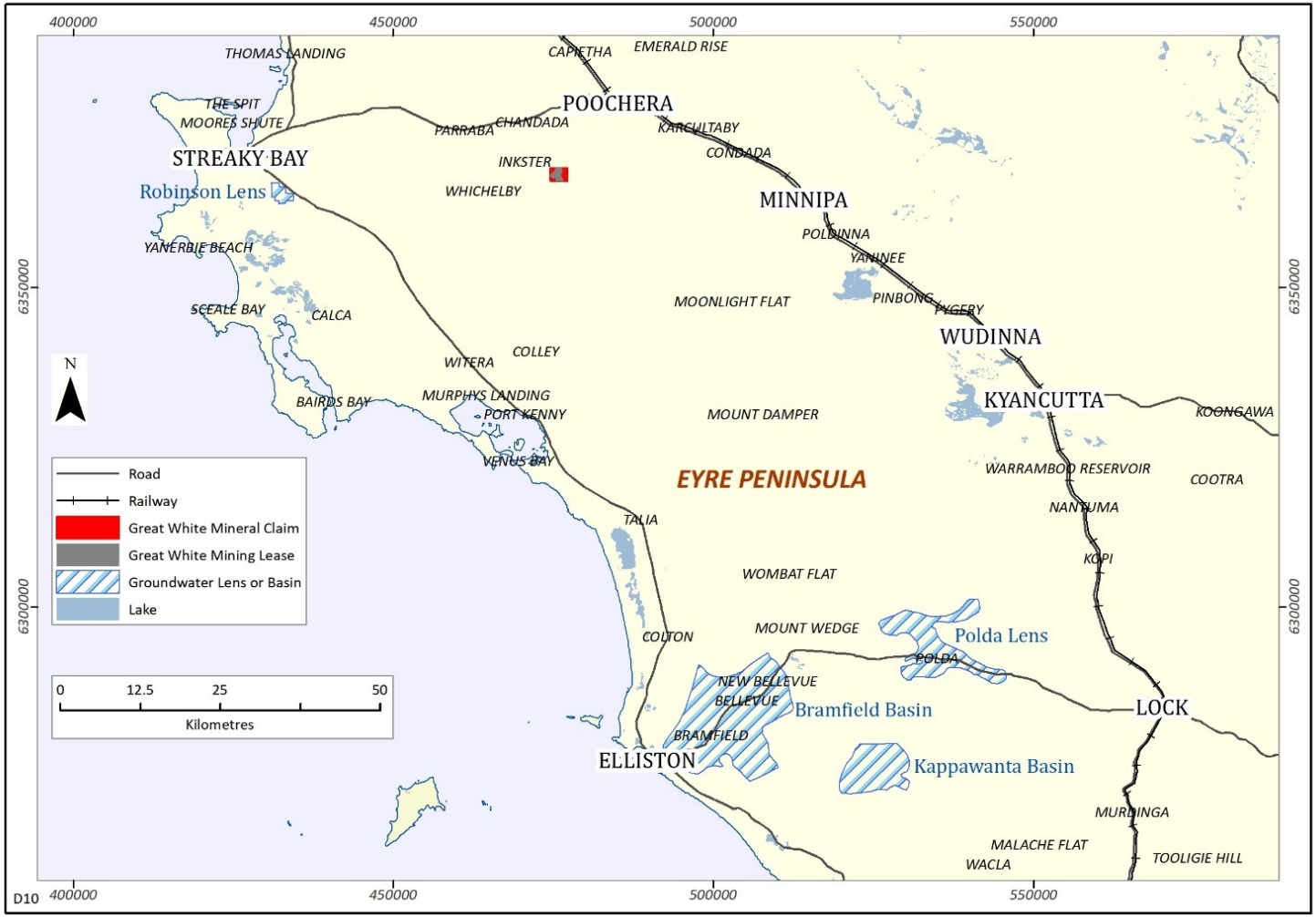
APPENDIX H – ADDITIONAL GROUNDWATER INFORMATION AND SENSITIVITY ANALYSIS

Contents

List of Tables

Attachment 1: location of water basins



Attachment 2: Shallow subsurface profile showing jointing in Bridgewater Formation

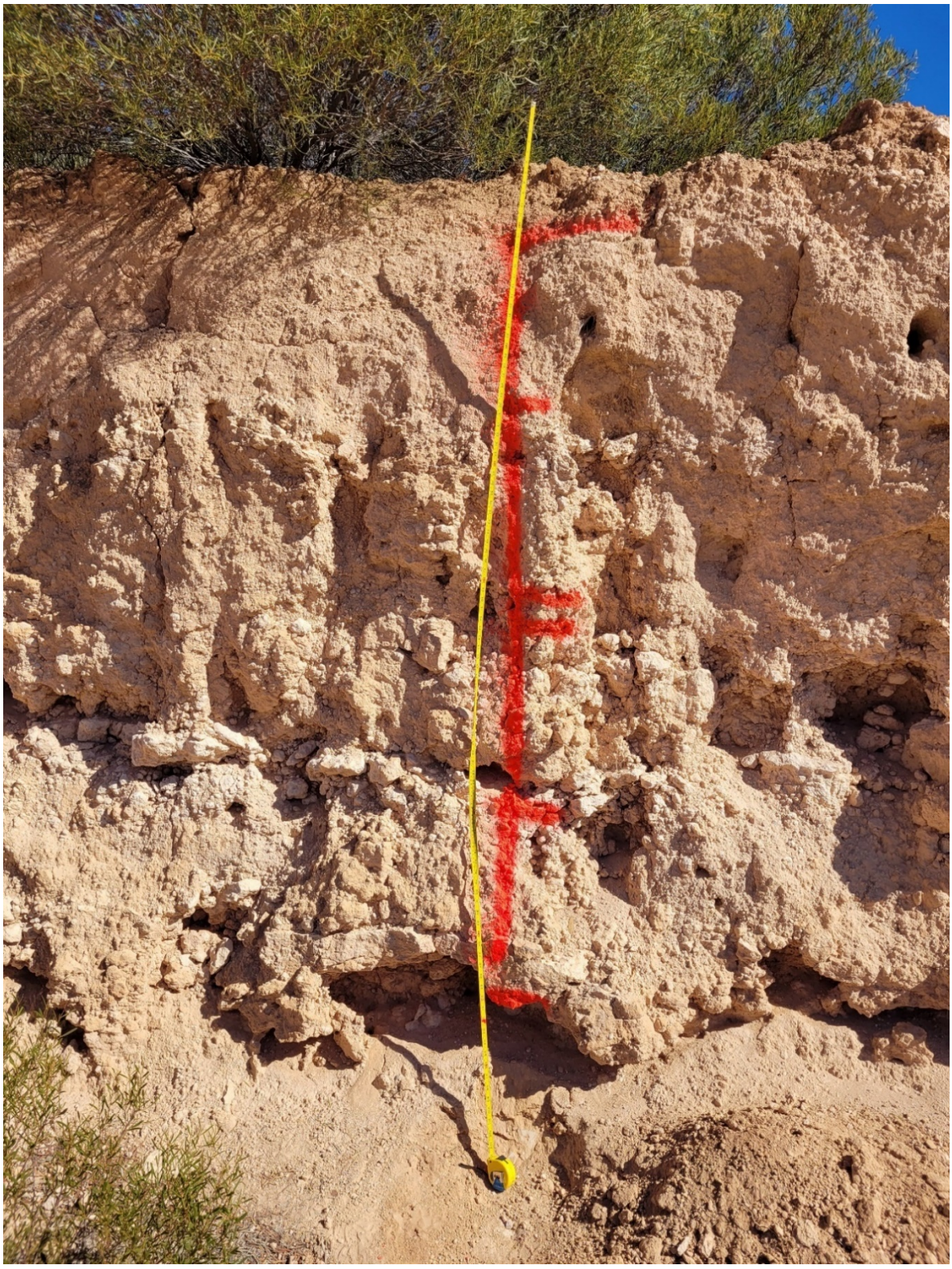
Photo of jointed calcrete (475520E 6367715N)

Attachment 3: Dissolution features in Bridgewater Formation

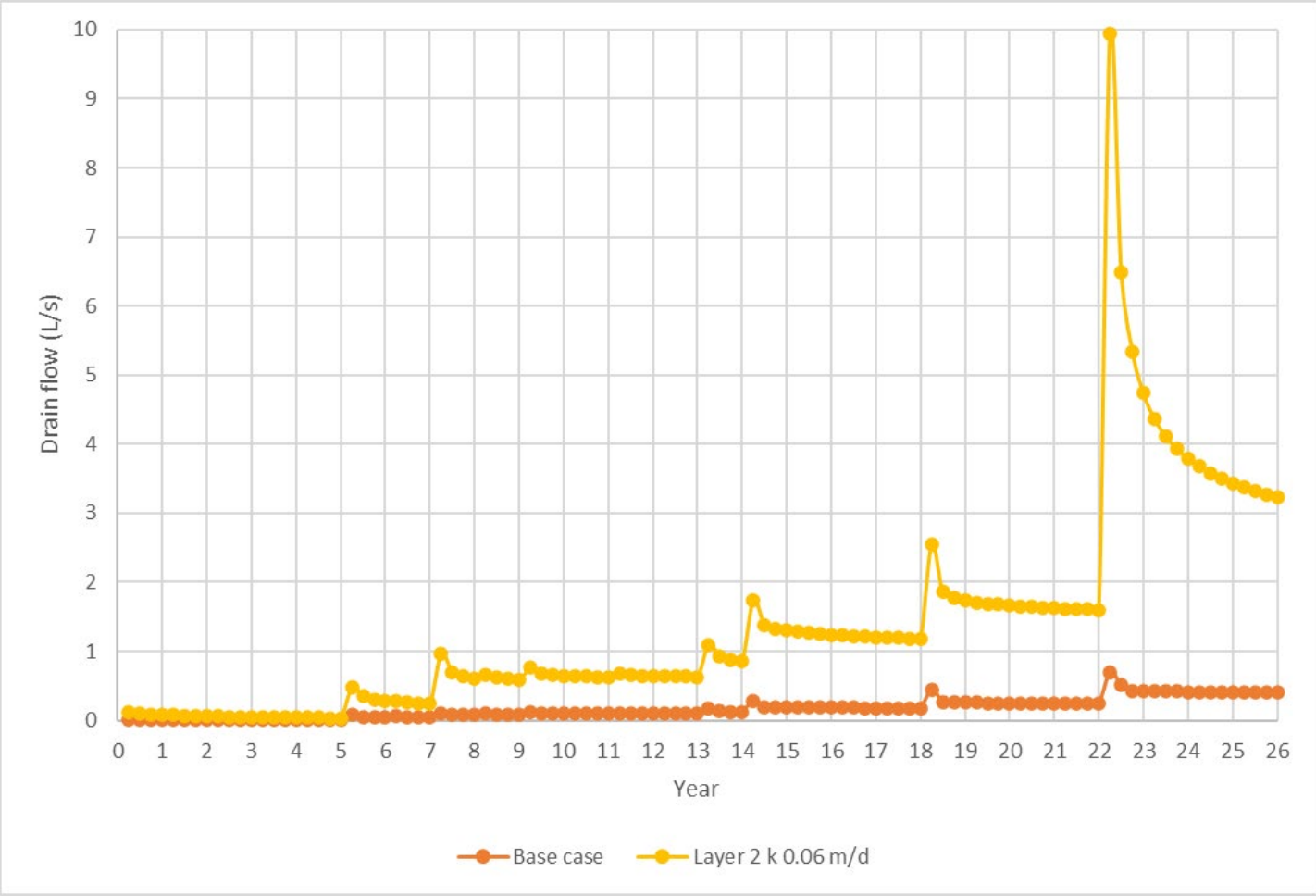
Dissolution features (76189 6367748N)

Attachment 4: Bridgewater Formation - Calcrete Horizon

Exposure in borrow pit (478220E 6368200N)



Attachment 5: Modelled drain flows for Layer 2 K = 0.06 m/d

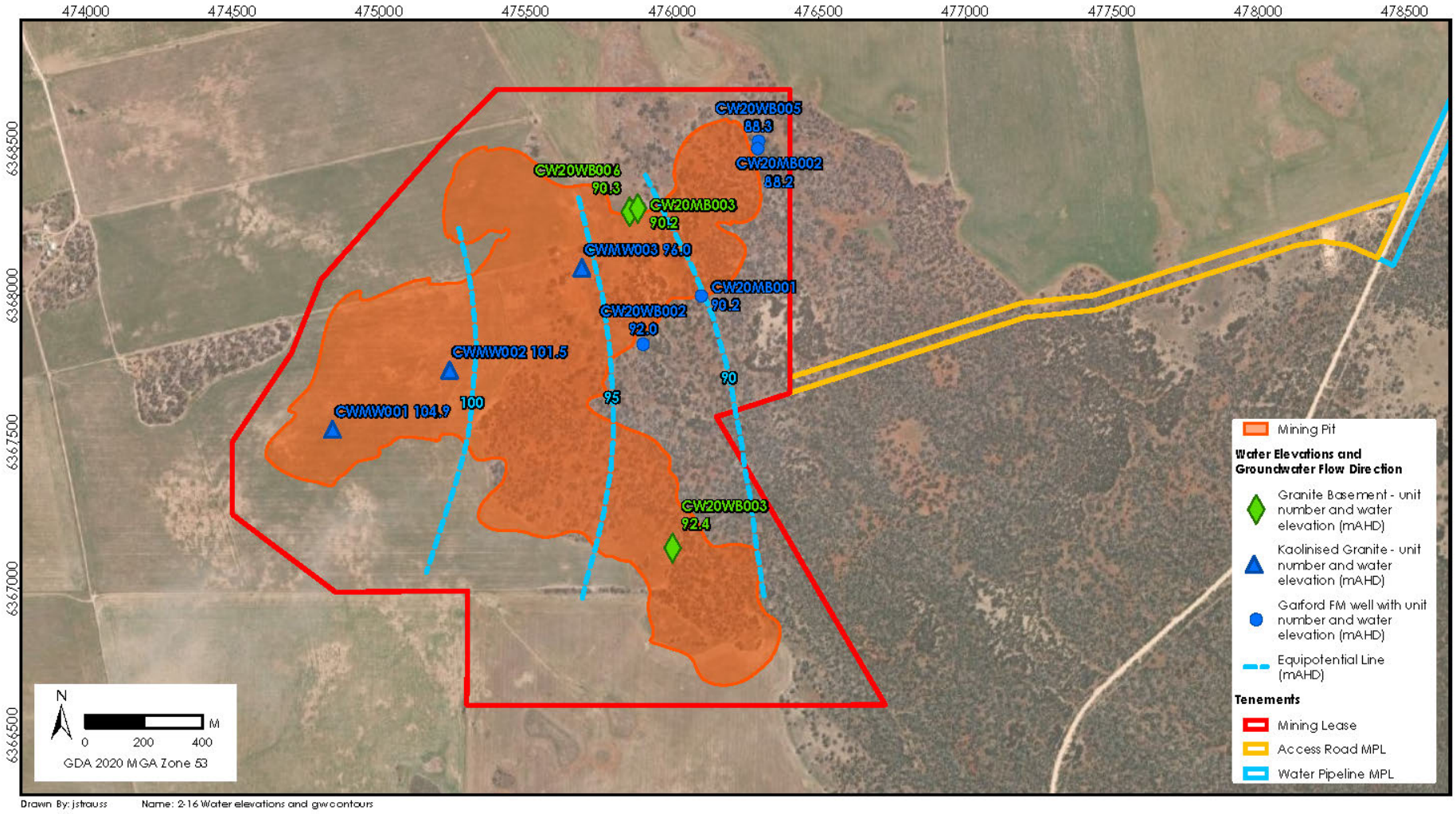


Base case Layer 2 k value = 0.0001 m/d

Attachment 6: Push tube sample from CW20MB003

at 16.1m which has a coefficient of permeability of 1.3E-09

Attachment 7: Water Elevations and Groundwater Contours



Attachment 8: Groundwater Model Sensitivity analysis

Great White Deposit, 26 Year Dewatering Design

Model Sensitivity Runs - Combinations of High K / Low Sy and Low K / High Sy

24 May 2021

An initial set of model sensitivity runs were undertaken in response to DEW review comment no. 25:

"There is no sensitivity and uncertainty analysis in Appendix J. These are integral part of any numerical model and should be completed to get a better appreciation about a range of outcomes. AGMG"

The objectives of the Stage 2 modelling reported in Aldam (2020a)[1] was to primarily provide initial estimates of the possible groundwater inflows into the excavated pits as mining progresses over the proposed 26 year timeframe, with a secondary objective being to estimate the expansion of drawdown impacts due to mining in proximity to the pit (with a few kilometres). This stage of modelling was consistent with Australian Groundwater Modelling Guidelines (Barnett, et al, 2012[2]) ***Guiding Principle 7.2:*** *Models should be constructed to address specific objectives, often well-defined predictions of interest. Uncertainty associated with a model is directly related to these objectives.*

The existing base case model includes geological layering (3 layers – Garford Formation, Kaolinised Granite and Granite Basement) and hydraulic parameters assigned to layers, and zones within layers, based on interpretations of regional data sets (e.g. geology, geophysics, groundwater data, climate) and the results of drilling and aquifer testing adjacent the proposed pit area and reported in Aldam Geoscience (2020b)[3]. Calibration of the base case model was targeted at site data, which is assigned a high level of confidence, with less weight placed on regional data away from the proposed pit, which is considered to have a low level of confidence. This approach was consistent with the model objectives described above.

An acceptable level of model calibration, for this stage of mine planning and primarily for groundwater inflow estimates, was achieved through a combination of adopting geological layering and hydraulic parameters with some confidence in and around the pit areas, together with semi-regional interpretations of geological layering and structures in the areas of the model domain away from the proposed pit (with significantly lower confidence).

The modelled pit inflows and drawdown expansion will vary with all assigned hydraulic parameters, with horizontal hydraulic conductivity (Kh)and specific yield (Sy) considered to be the dominant parameters on modelled outcomes. For comparison

[1] Aldam Geoscience (2020a). *Stage 2 Numerical Groundwater Model – Great White Deposit*, draft report, Andromeda Metals Ltd, November 2020).
[2] Barnett et al (2012). *Australian groundwater modelling guidelines*, Waterlines report, National Water Commission, Canberra.
[3] Aldam Geoscience (2020b). *Stage 2 Groundwater Investigations – Great White Deposit*. Final Report, Andromeda Metals Ltd, November 2020.

to the existing Stage 2 base case model results, the following model sensitivity runs were undertaken:

- Adopt **upper** range of hydraulic conductivity based on aquifer tests for Layers 1 and 3 and combine with **lower** range of specific yield based on aquifer test in layer 1 and an assumed estimate for layer 3. Layer 2 parameters were kept the same as for the base case.
- Adopt **lower** range of hydraulic conductivity based on aquifer tests for Layers 1 and 3 and combine with **upper** range of specific yield based on assumed estimates for layers 1 and 3. Layer 2 parameters were kept the same as for the base case.

It should be noted that the initial model was calibrated with a specific set of Kh values and significant modelling errors can be introduced if Kh is varied without model re-calibration, especially in later model time periods. This method is however typically used to provide some indication of model sensitivity to Kh. The model parameters adopted for the Stage 2 numerical modelling reported in Aldam (2020a) are shown in Table 1 together with ranges for each parameter based on aquifer testing, laboratory analysis or a plausible assumed value. The value ranges used for horizontal hydraulic conductivity and specific yield for layers 1 and 3 in the model sensitivity runs are indicated in Table 1.

This approach is consistent with the AGMG ***Guiding Principle 5.5:*** *Sensitivity analysis should be performed to compare model outputs with different sets of reasonable parameter estimates, both during the period of calibration (the past) and during predictions (in the future)*.

The effects of these changes on the predicted drawdown at the end of the 26 year mining period are shown on the following series of maps (Figure 1(a) to Figure 3(c)). It is important to note that changing Kh values from the calibrated steady state model will create errors in model computations, including areas of negative drawdown and potentially significant erroneous influences of the model boundary conditions. The modelled drawdown results should therefore be treated as broadly indicative only, and are presented to indicate the level of uncertainty of the model prediction, consistent with the AGMG ***Guiding Principle 7.1:*** *Because a single 'true' model cannot be constructed, modelling results presented to decision-makers should include estimates of uncertainty*.

The key outcomes of the model sensitivity analysis are:

- For the primary model objective of providing preliminary pit dewatering estimates, in no scenario did the average 3-monthly (model time step) drain flow exceed 1.5 L/s. Hence dewatering volumes are expected to remain very low regardless of parameters adopted.
- For the secondary model objective of estimating drawdowns associated with pit dewatering, the sensitivity analysis indicates that:
    - The base cases representing the 26 year pit dewatering scenario based on the parameters used in the initial calibrated steady state model produce a more radial cone of depression than the other scenarios

without negative drawdowns and significant boundary condition influences. The patterns of drawdown in all 3 layers in the south east of the model domain appear to be significantly influenced by the channel morphology within the surface of the kaolinised granite (layer 2) and the interpreted higher permeability fault zone in the granite basement (layer 3).

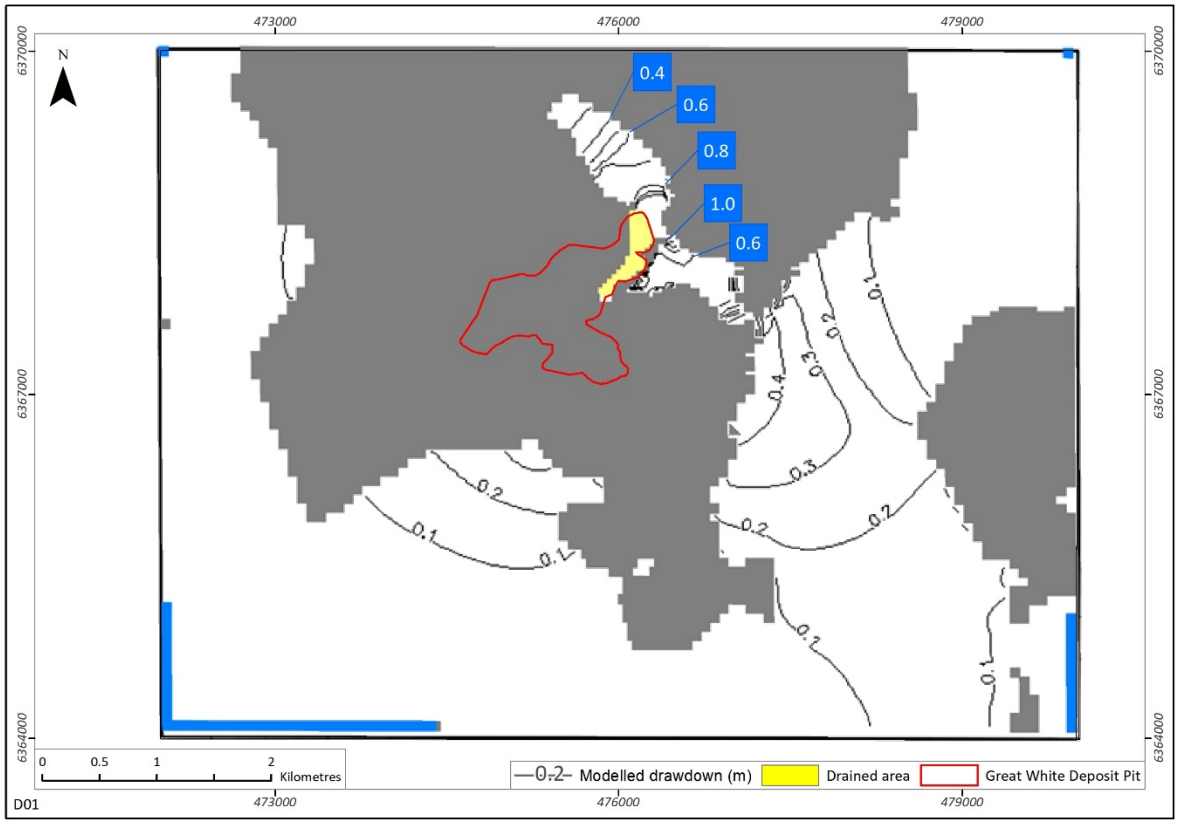
- Using Kh values that differ from the calibrated steady state model introduces errors and model instability which produced significant errors such as negative drawdowns and model boundary influences. The modelled drawdown extents should therefore be treated as indicative only.
- Drawdowns produced in the south east of the model domain are influenced by the model boundary cells in that area. The domain would need to be expanded and the model re-calibrated to better enable impacts on the Tomney wells to be assessed.

Further comments on each of the sensitivity scenarios are provided in the descriptions of Figures 1(a) to 4 below.

Table 1: Model hydraulic parameters and scenario combinations

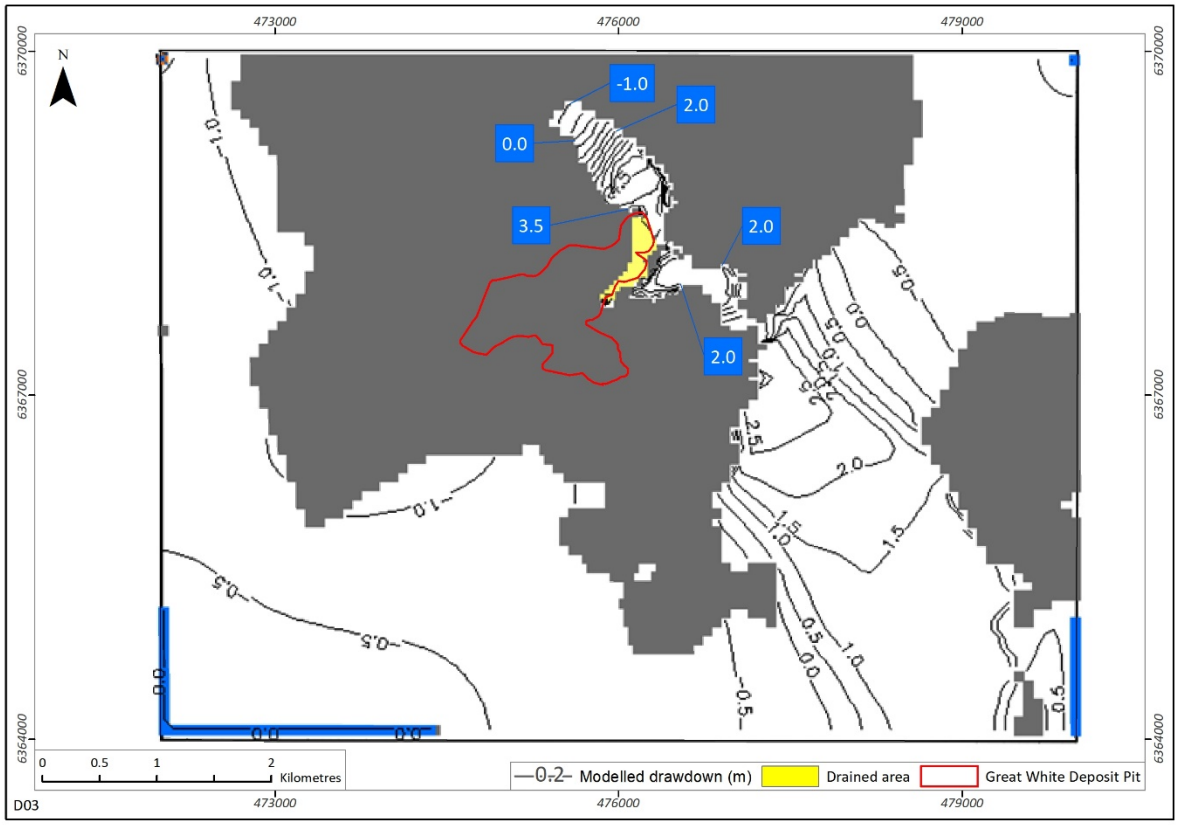
Measured and assumed range of key hydraulic parameters									
Parameter	**Garford Fm (Layer 1)**	**Lower**	**Upper**	**Kaolinised Granite (Layer 2)**	**Lower**	**Upper**	**Granite Basement (Layer 3)**	**Lower**	**Upper**
Horizontal hydraulic conductivity (K_h m/d)	0.1 regionally 2 in channel	0.05 2	0.4 2	0.0001	0.0001	0.0001	0.02 regionally 1 in channel	0.01 1	0.04 1
Vertical hydraulic conductivity (K_v m/d)	0.02	0.02	0.02	0.0001	0.0001	0.0001	0.02 regionally 1 in channel	0.02 1	0.02 1
Specific yield (S_y)	0.02	0.02	0.05	0.001	0.001	0.001	0.005	0.0025	0.01
Specific storage (S_s per m)	-	-	-	0.00001	0.00001	0.00001	0.00005	0.00005	0.00005
Adopted for Stage 2 model									
Aquifer test value									
Lab test value									
Range - assumed									

Figure 1(a): Layer 1 drawdown at 26 years - base case



This figure shows the drawdown in the Garford Formation (model layer 1) is steep near the pit where drain cells (shown in yellow) were used in the model to dewater this unit in the north east section of the pit. Drawdown then decreases gradually to the south east and south west. Large parts of the model domain are unsaturated (shown in grey), consistent with local groundwater data in and adjacent the pit and are considered broadly consistent with the possible semi-regional extent of saturated Garford Formation. The unsaturated extents are consistent with the steady state pre-mining extents. The trends of the 0.1 m drawdown contours in the south east are influenced by the topography of the underlying kaolinised granite (model layer 2) which indicates a channel morphology in this region. (Note that on the layer 1 maps the constant head boundary cells are shown in blue. Additional contour labels have been added in blue text boxes for clarity around the pit).

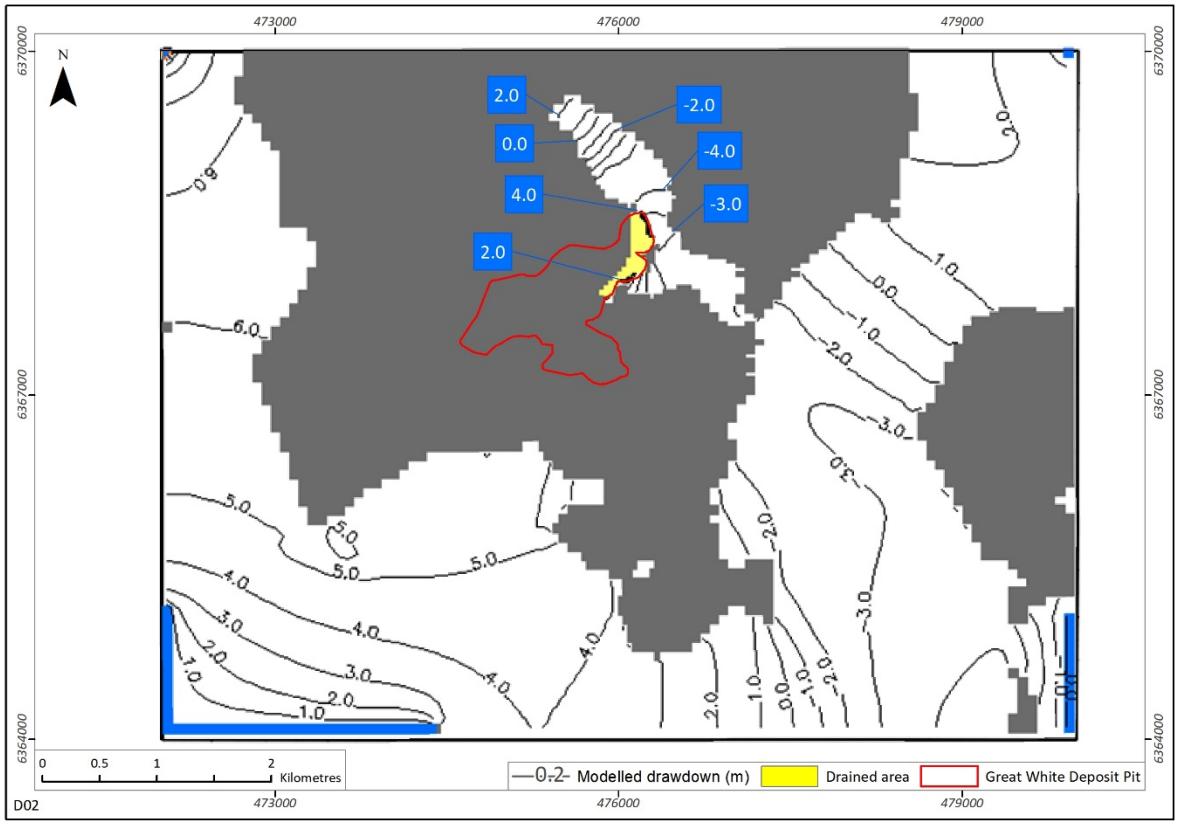
Figure 1(b): Layer 1 drawdown at 26 years – low K, high Sy



This figure shows that decreasing hydraulic conductivity and increasing specific yield leads to an increase in drawdown in the central east of the model domain, with a more pronounced flow field in the south - southeast. This is interpreted to be influenced by the channel morphology in the Garford Formation and the underlying higher permeability fault zone in the granite basement (model layer 3). Model instability is indicated by negative drawdowns to the west and northeast.

The failure of this sensitivity model, as demonstrated by the negative drawdown contours, supports the parameters used in the base case scenario.

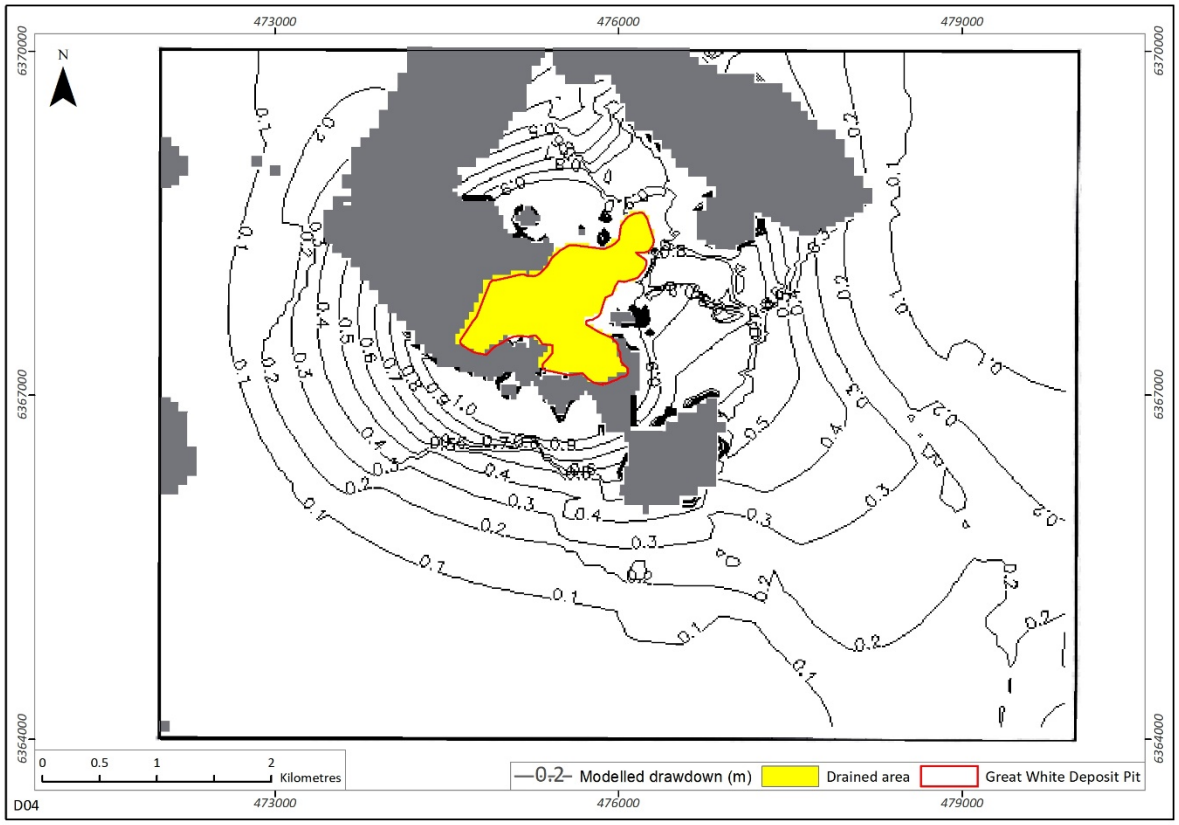
Figure 1(c): Layer 1 drawdown at 26 years – high K, low Sy



The high k, low Sy scenario produces areas with significant negative drawdown, including in the vicinity of the pit, caused by model instability due to the different k values introduced compared to the calibrated steady state model. Regional drawdowns are much higher to the west and south west consistent with a higher k.

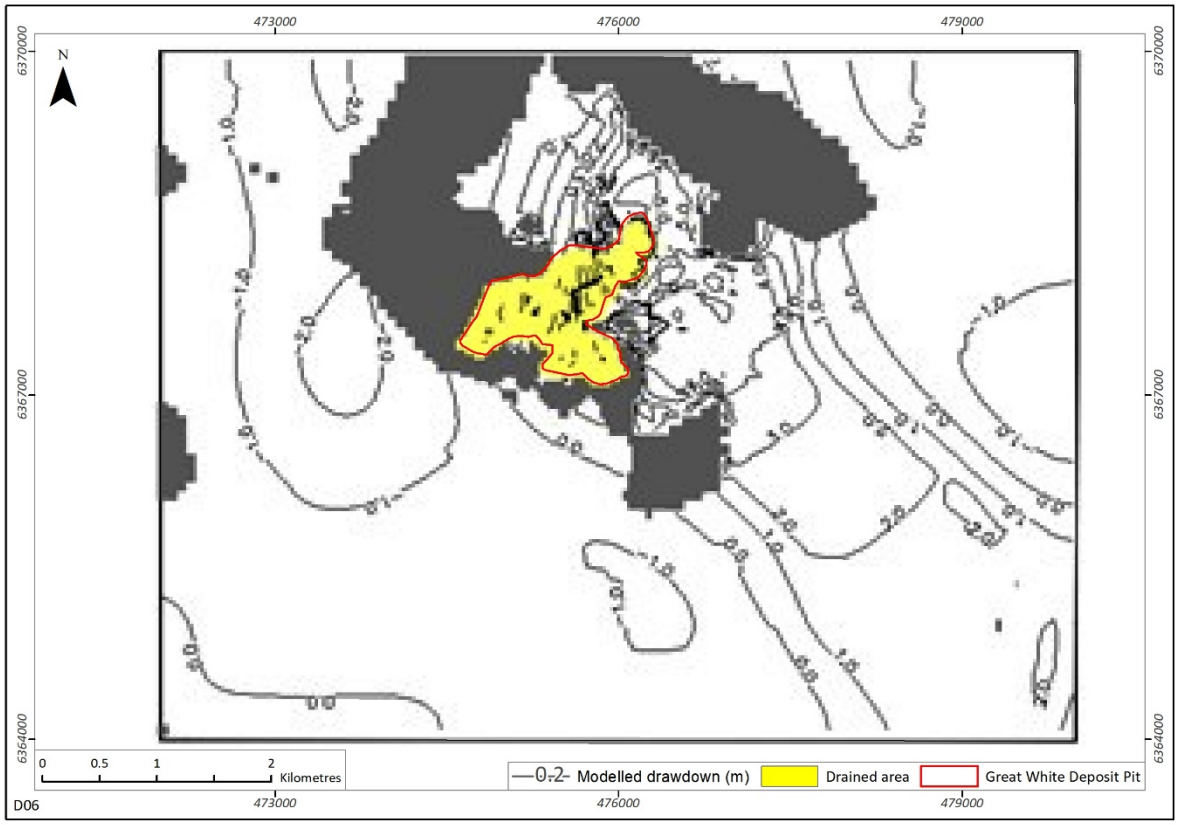
The failure of this sensitivity model, as demonstrated by the negative drawdown contours, supports the parameters used in the base case scenario.

Figure 2(a): Layer 2 drawdown at 26 years - base case



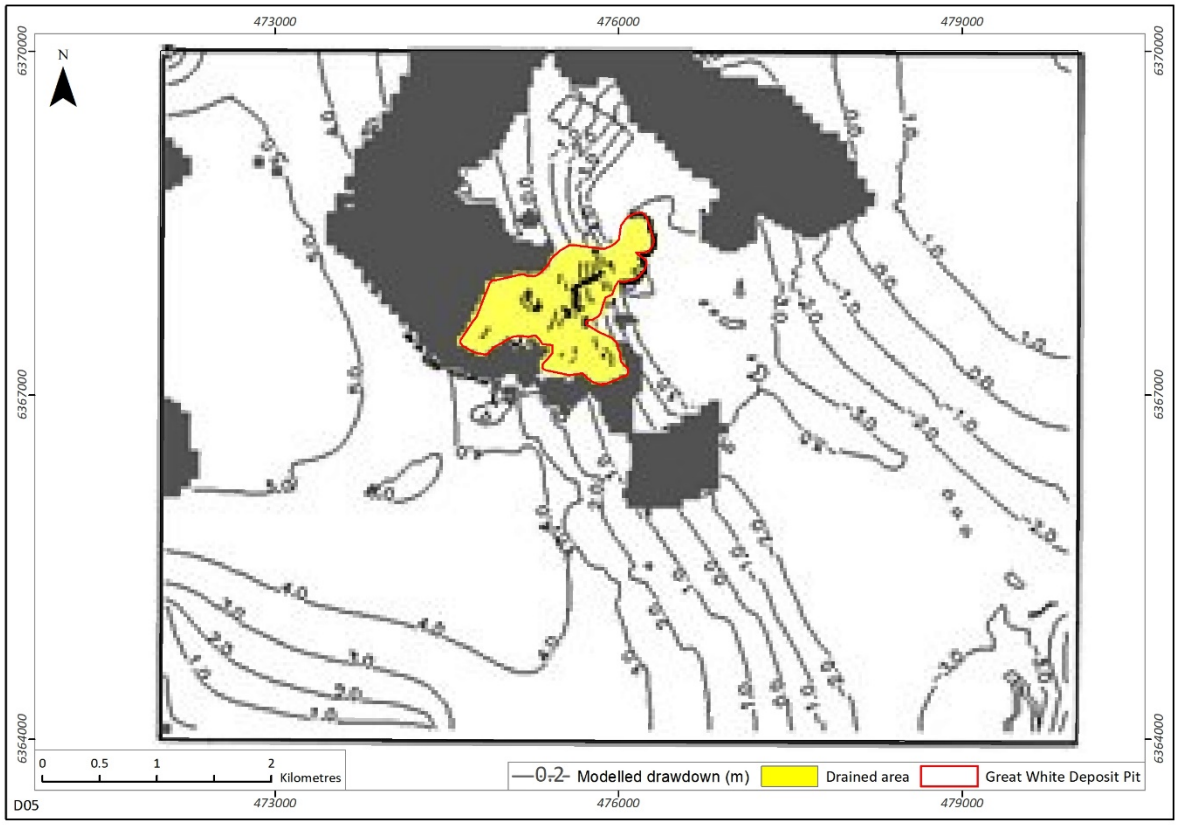
For Layer 2, the base case model run produces an almost radial cone of depression around the pit where model drain cells (shown in yellow) are used to dewater layer 2 to the pit floor design levels. Boundary cell influences are apparent at the south east. Unsaturated areas are shown in grey and, outside of the pit, these are consistent with the steady state pre-mining unsaturated extents. Pit dewatering also results in some areas becoming unsaturated within the pit extent.

Figure 2(b): Layer 2 drawdown at 26 years – low K, high Sy



The cone of depression is much less rounded in this scenario, with areas of closed contours occurring. Drawdown values are up 10 times higher than in the base case and areas of negative drawdown to the east and west indicate the errors introduced with changing the k values in layers 1 and 3 compared to the calibrated steady state model.

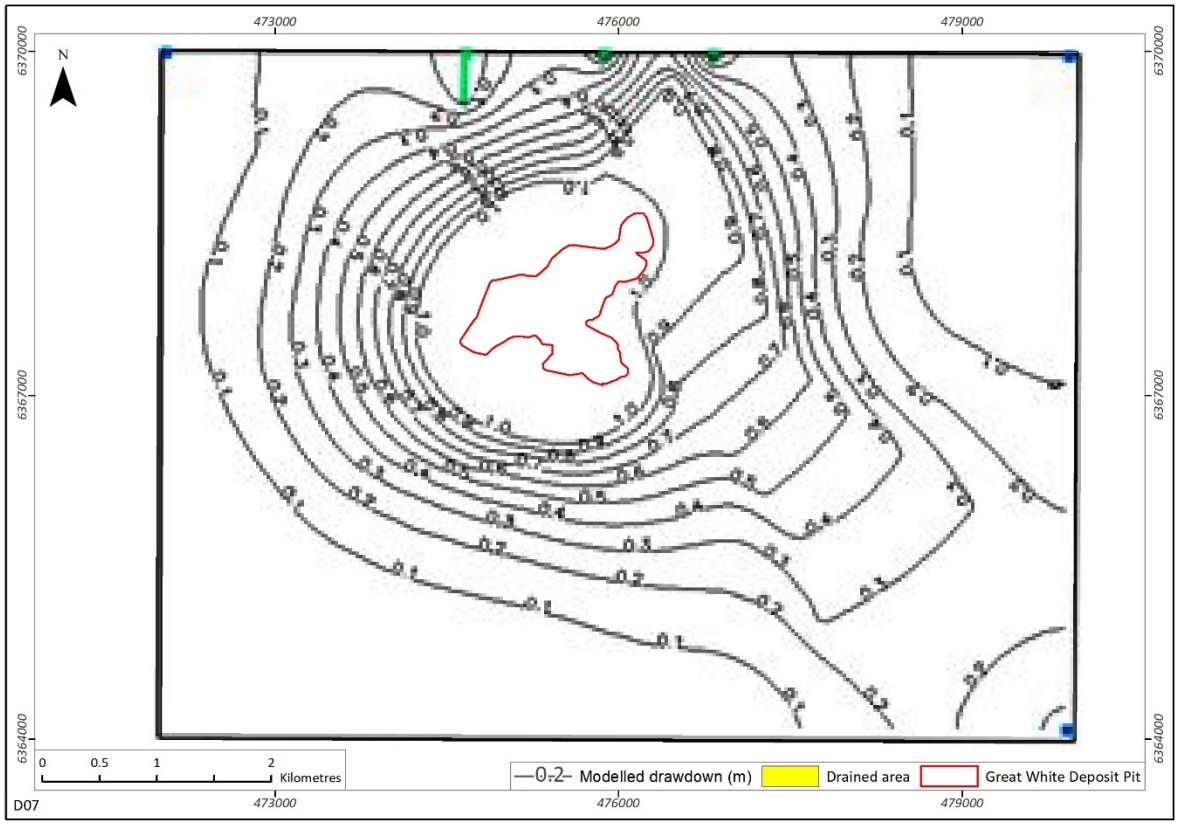
Figure 2(c): Layer 2 drawdown at 26 years – high K, low Sy



The high k scenario shows greater drawdown in the west of the domain. The contours are clearly skewed toward the constant head cells in layers 1 and 3 at that location and are probably influenced by the underlying higher permeability fault zone in the granite basement.

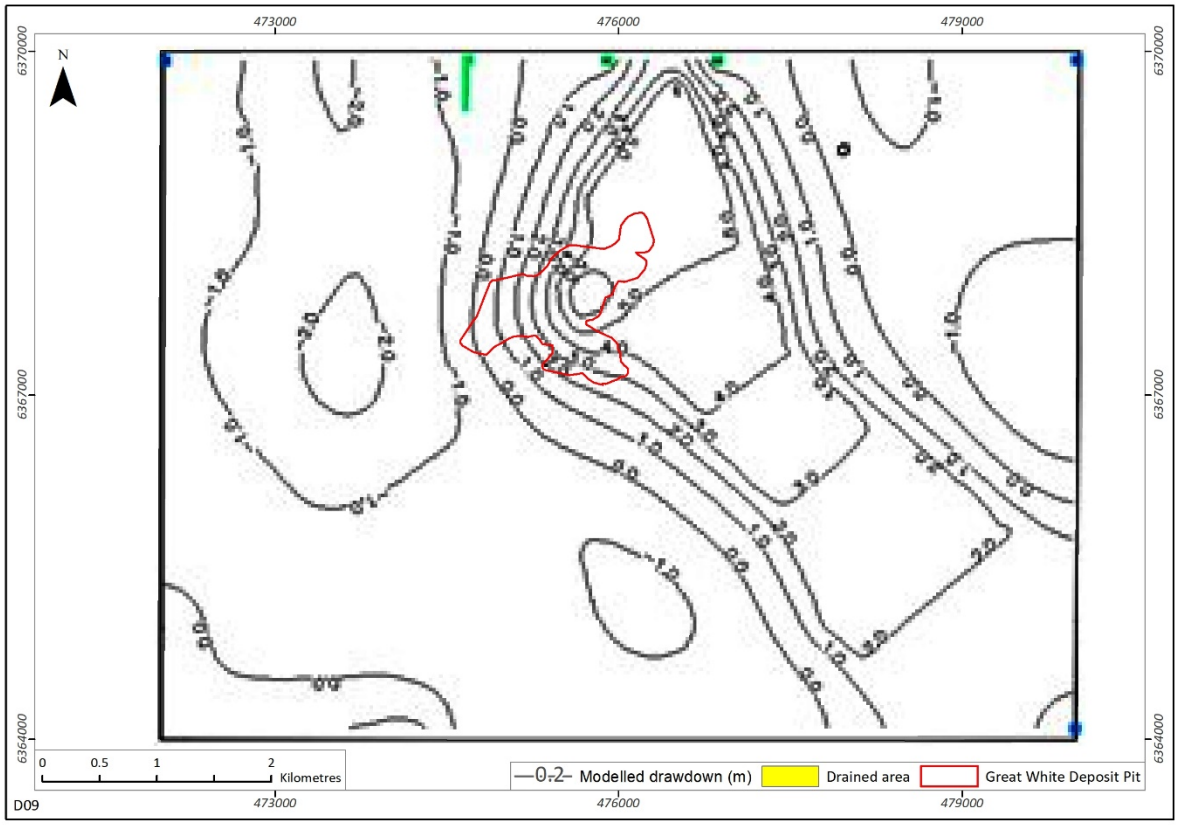
The failure of this sensitivity model, as demonstrated by the negative drawdown contours, supports the parameters used in the base case scenario.

Figure 3(a): Layer 3 drawdown at 26 years - base case



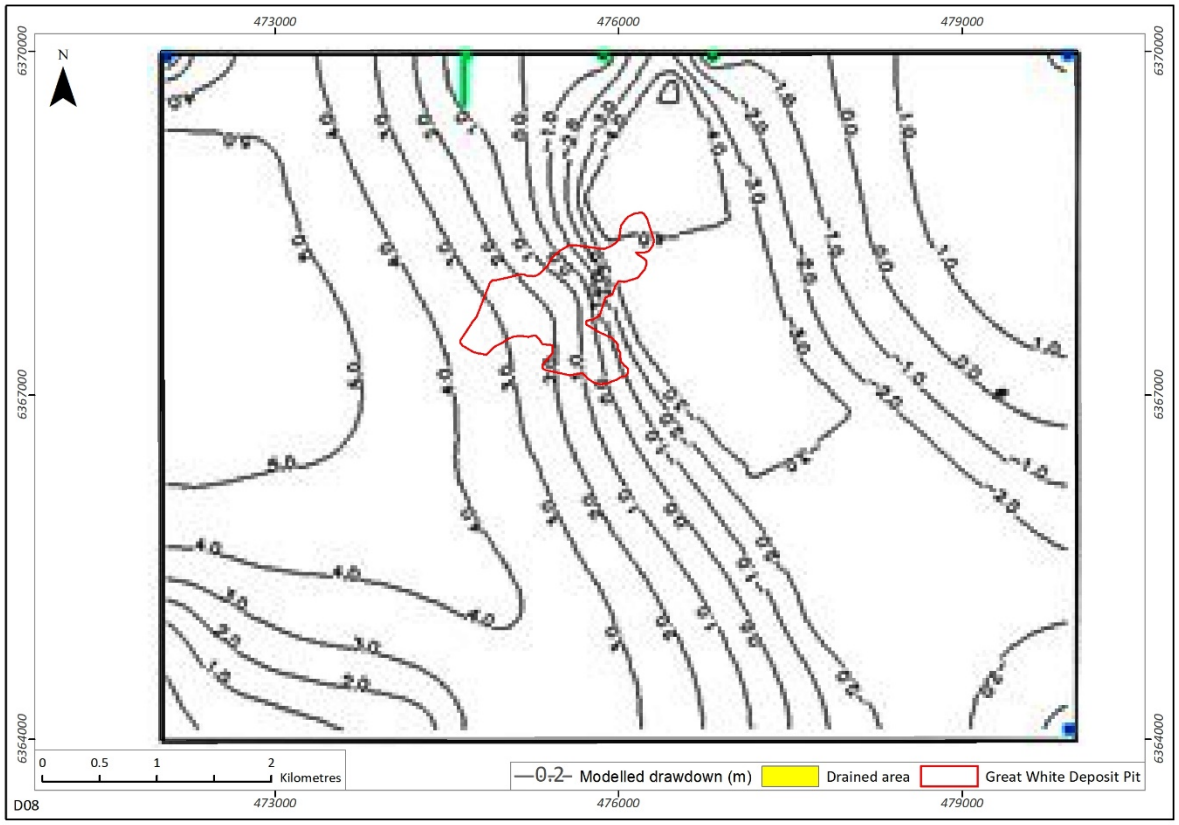
Layer 3 drawdowns in the base case form a fairly uniform cone of depression with drawdown of 0.3 m or less occurring in the south east. The 0.2 m contour in that area is likely influenced by the constant head cells in the south east corner of the model domain. The drawdown trend to the south east is heavily influenced by the inferred higher permeability fault zone in the granite basement. (Note that on the layer 3 maps general head boundary cells are shown in green and constant head cells in blue).

Figure 3(b): Layer 3 drawdown at 26 years – low K, high Sy



This scenario shows significantly increased drawdown around the pit and to the south east of it. The areas of closed negative contours in the west and east are a result of changing k values from the calibrated steady state model.

Figure 3(c): Layer 3 drawdown at 26 years – high K, low Sy

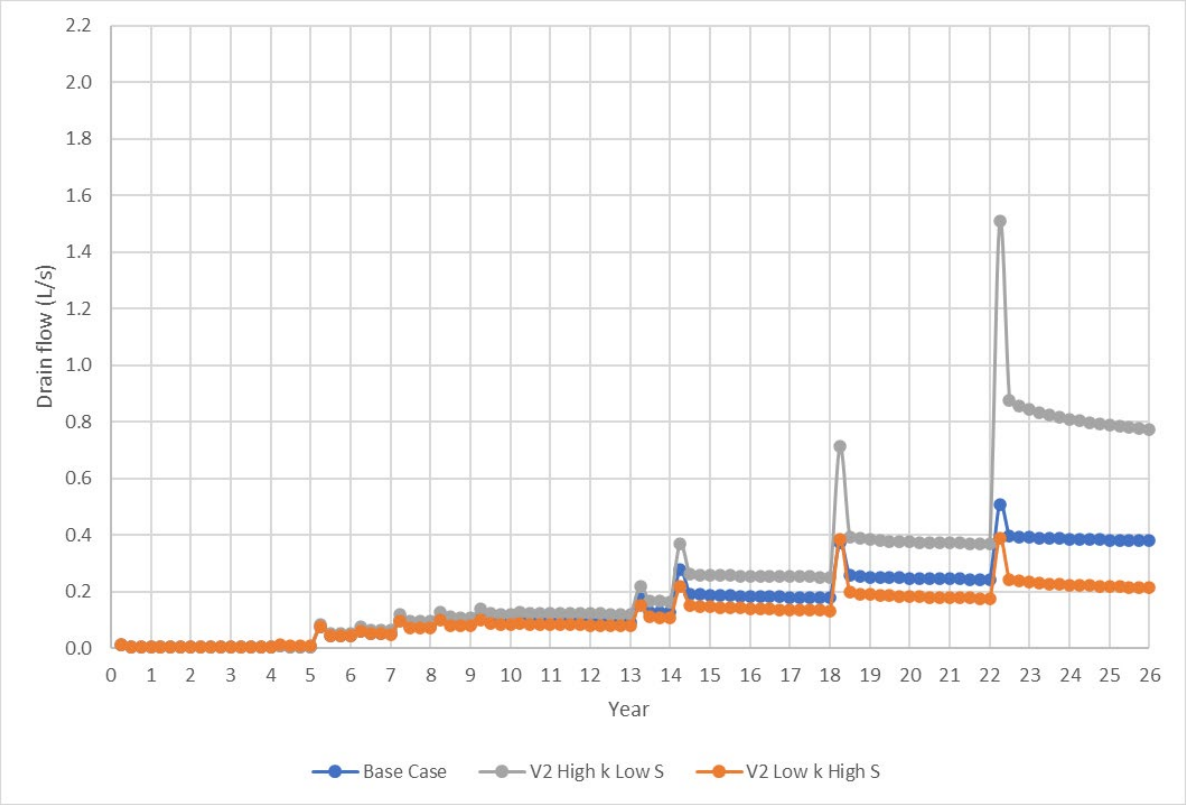


The layer 3 high k scenario also produces a trough like cone of depression but with somewhat lower drawdown than in the low k high Sy scenario. It also does not produce the closed negative contours to the west of the pit. The trend of the drawdown contours, including those near the pit, are clearly influenced by the inferred higher permeability fault zone.

The failure of this sensitivity model, as demonstrated by the negative drawdown contours, supports the parameters used in the base case scenario.

Figure 4: Modelled drain inflows over the proposed 26 year mining period

A graph comparing the modelled pit inflows for each of the scenarios over the proposed 26 year mining period is provided below.



As shown in this figure, lowering k and increasing Sy leads to a reduction in drain flows, whereas increasing k and reducing Sy leads to a modelled increase in flows from the drain cells of about 100 %. However, in all scenarios modelled, drain outflows (discharge from the pit) remains less than 1 L/s for almost all years. Such discharge will most likely occur by evaporation.