

10 October 2023

Ref: 2718_DA1_320_001

State Assessment and Referral Agency
Department of State development, Infrastructure, Local Government and Planning
Wide Bay Burnett Regional Office
PO Box 979
Bundaberg QLD 4670

Attention: Jackie Larrarte – Senior Planning Officer
Via: MyDAS2 System

Dear Jackie,

RESPONSE TO INFORMATION REQUEST

DEVELOPMENT APPLICATION FOR A MATERIAL CHANGE OF USE – DEVELOPMENT PERMIT FOR EXTRACTIVE INDUSTRY AND ASSOCIATED ENVIRONMENTALLY RELEVANT ACTIVITIES AT LAND LOCATED ON PARADISE ROAD, CORINGA QLD 4621, PROPERLY DESCRIBED AS LOT 17 CK1566

STATE ASSESSMENT AND REFERRAL AGENCY REFERENCE: 2303-33751

On behalf of Galilee Crushing & Civil Pty Ltd, the applicant for the abovementioned application, Groundwork Plus provides the following response to the Information Request issued by the State Assessment and Referral Agency ('SARA') on 29 May 2023.

In accordance with Section 13.2 of the Development Assessment Rules ('DA Rules') under Section 68(1) of the *Planning Act 2016*, this letter comprises a response to all items requiring additional information as requested by SARA. Each item raised in the Information Request letter has been re-stated below with a corresponding response.

State Transport Network

1. Issue:

Insufficient information has been provided in support of the proposed development for SARA to determine compliance with Performance outcome (PO)1 to PO3 of State code 6: Protection of state transport networks (State code 6) of the SDAP. Specifically, a Traffic Impact Assessment (TIA) has not been included in the application material.

While SARA acknowledges that no haulage of excavated material will occur on the state-controlled road network, the establishment of the extractive use will generate traffic that has neither been quantified or considered in the development application. As such, compliance with PO1 to PO3 of SDAP cannot be determined without further assessment of the traffic impacts from the proposed extractive industry use.

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Action:

It is requested that you provide a TIA, prepared by a suitability qualified traffic consultant in accordance with the Department of Transport and Main Roads' (DTMR) Guide to Traffic Impact Assessments December 2018 (GTIA).

The TIA should include the following, at a minimum:

- a) The number, types and frequency of traffic that will be generated by the proposed extractive industry use on a daily, AM Peak and PM Peak hour basis. This should include staff (to man and operate the extractive industry use), arrival and departure of unloaded haul vehicles to site, deliveries such as fuel, consumables and other extractive industry supplies, and any other traffic generated by the use.*
- b) Provide the distribution of the generated traffic at the state-controlled road intersection (Booyal-Dallarnil Road/ Grills Road intersection). You are requested to also include justification for assumptions used including, but not limited to, those for determining the origin/destinations for staff and /or deliveries required to support the use.*
- c) Identify the impact assessment year calculated in accordance with Table 6.5 of the GTIA. Please note that the impact assessment year refers to the opening year of the proposed development.*
- d) Consider existing traffic on the state-controlled road network and adopt appropriate traffic growth. Please note that the traffic accessing the Paradise Dam site or other land uses within the Grills Road catchment will also need to be taken into consideration.*
- e) Undertake a road safety assessment of the traffic impacts prepared in accordance with Section 9 of GTIA. In particular, consideration should be given to whether the increase in traffic movements generated by the proposal will have an impact on the safe operation of the state-controlled road intersection (Booyal-Dallarnil Road/ Grills Road intersection) or any other intersections where traffic exceeds 5% on base traffic volumes.*
- f) Where impacts are identified, you are requested to propose recommendations to mitigate the development's impact on the state-controlled road network. Recommendations involving roadwork upgrades on the state-controlled road must also include conceptual geometric design drawings to demonstrate the design of the road work upgrades can comply with the DTMR's Road Planning and Design Manual 2nd edition. Any road work upgrades must be contained wholly within existing road corridors.*

Response:

A response to Issue 1 has been prepared by McMurtrie Consulting Engineers (refer **Attachment 1 – Traffic Assessment**). The Traffic Assessment recommends that vegetation clearing on a section of Paradise Road is carried out to increase the available sightlines and improve the safety and function of the road. The clearing works will be carried out within road reserve and is classified as exempt clearing work in accordance with Schedule 21, Section 5 of the *Planning Regulation 2017*.

Environmentally Relevant Activities

Operational Matters

2. Issue:

It is unclear whether the take effect date, referenced in section 11 of the environmental authority application form, is referring to the take effect date of the development approval.

Action:

Please confirm whether the take effect date, referenced in section 11 of the environmental authority application form, is referring to the take effect date of the development approval. Please note that the take effect date refers to the date the land use is allowed to commence.

Response:

The take effect date for the Environmental Authority referenced in the Environmental Authority Application Form is the date that the proposed extractive industry commences operation. The Department of Environment and Science will be notified of the date for the Environmental Authority to take effect. Suggested wording for the take effect is as follows:

'The Environmental Authority takes effect on the date that your related development approval takes effect.'

This wording for the take effect date was recently issued by the Department as part of P-EA-100145071.

Rehabilitation

3. Issue:

SARA acknowledges that you have provided a rehabilitation plan as part of the environmental management plan. However, upon review, it is determined that the maximum footprint of the proposed disturbed area has not been provided.

Action:

Please provide information clarifying the maximum footprint of the disturbed area at any time.

Response:

It is possible that the entire proposed footprint will be disturbed at any one time (10 hectares). However, it is intended to progressively rehabilitate the areas of the quarry footprint where the available resource has been extinguished and site operations allow. The rehabilitation of the site will be responsive to the needs of the Paradise Dam Improvement Project including the construction timeline. Although the timeline for the Paradise Dam Improvement Project has not yet been confirmed, it is anticipated that the proposed quarry could be operational for up to four (4) years. At the cessation of the Paradise Dam Improvement Project the site will be rehabilitated in accordance with the requirements of the Environmental Authority.

Stormwater Basin

4. Issue:

Insufficient information has been provided regarding the impacts of proposed stormwater basin to the environment.

SARA acknowledges that you have provided a conceptual Quarry Stormwater Management Plan. However, upon review, following issues are identified:

- *No GPS coordinates of discharge locations have been identified.*
- *Insufficient details regarding stormwater releases and stormwater quality have been provided.*

Further information is requested to ensure that the proposed sediment basin is suitably located and designed to avoid environmental harm to the surrounding environment.

Action:

You are requested to provide the following information:

- a) *A map with GPS coordinates (Latitude and Longitude) for all discharge locations.*
- b) *Mechanisms used to control stormwater release*
- c) *Identity which of the below way(s) the release from the basins would occur:*
 - *Overflow*
 - *end of pipe release*

- *through an overland flow arrangement.*
- d) *The quality of settled/treated stormwater proposed to be released from the site. It is also requested that you to confirm the limit type for pH as recorded in Table 9 of the following plan:*
 - *Paradise Dam Quarry Environmental Management Plan, prepared by groundwork plus, dated April 2023, issue 0, reference number 2718_610_001.*
- e) *Provide information and details regarding whether stormwater releases from the basin will cause any adverse impacts on the environmental values.*

Response:

The Conceptual Quarry Stormwater Management Plan (Attachment 2 of the Environment Management Plan) has been amended in response to issue 4 (refer **Attachment 2 – Environmental Management Plan**).

Flooding mitigations

5. Issue:

Insufficient information has been provided regarding site mitigation actions ahead of a flood event.

SARA acknowledges that measures to avoid and manage flood risks have been included as part of the submitted Environmental Assessment Report. However, as stated in section 3.3 of the report, the proposed local creek catchment flood overlay mapping relevant to the site identifies the site would be affected by a 1% AEP flood event. As such, further information is requested to understand the management actions for flood events as there is risk of erosion and sediment release from the site during a flood event.

Action:

You are requested to provide the following information:

- a) *Management actions that would be undertaken to prepare the site in the event of a flood.*
- b) *Whether the stormwater basin is designed with consideration to flood events and to ensure contaminated water does not leave the site.*
- c) *How chemical storage areas are managed ahead of a flood event to ensure no contaminants would be released.*

Response:

The proposed quarry footprint has been located on a portion of the site that is not affected by a 1% AEP event. This is reflected in the Council's flood hazard and inundation mapping (refer to **Figure 1** below).

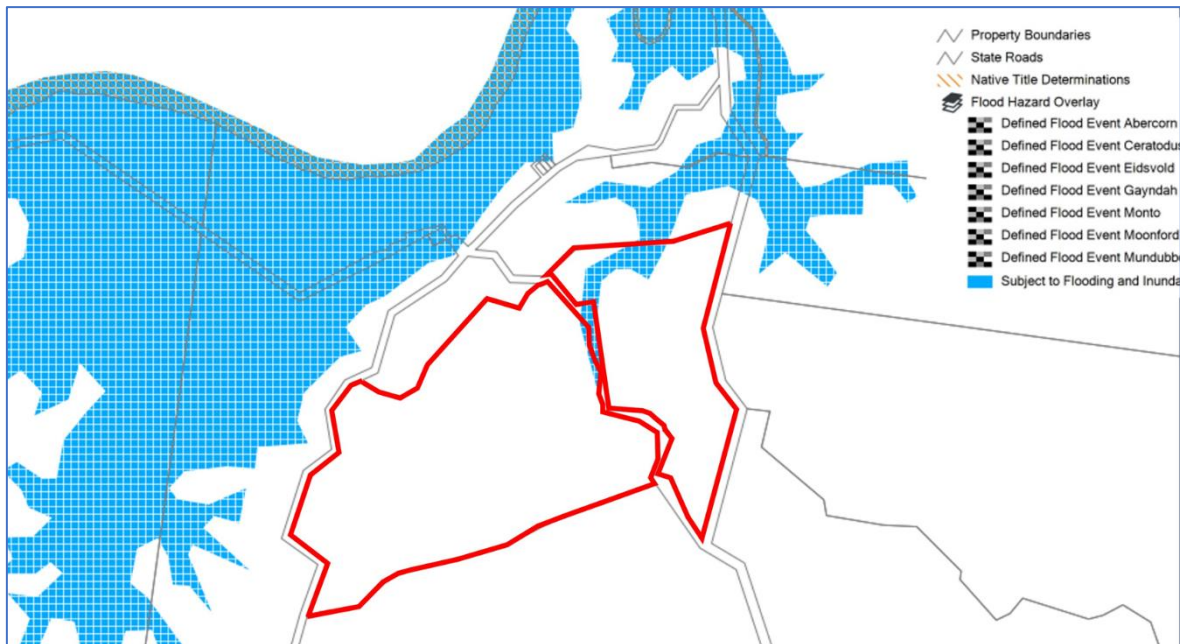


Figure 1 – Council's Flood Hazard and Inundation Mapping

Therefore, the proposed operation (including the stormwater devise and chemical storage areas) will be located outside of the mapped flood hazard area. The site will not be operational in heavy rainfall and all site personal can safely be evacuated from the site in the event of a flood.

Noise Impacts

6. Issue:

Insufficient information has been provided regarding the noise and blasting performance, as well as effects on the receiving environment.

SARA acknowledges that a Noise Management Plan has been provided as part of the Environment Management Plan (refer to Paradise Dam Quarry Environmental Management Plan, prepared by Groundwork Plus, dated April 2023, issue 0, reference number 2718_610_001). However, upon reviewing the plan, following issues have been identified:

- *The plan does not address the noise management hierarchy, environmental values, quality objectives and the management intent for the acoustic environment, as outlined in Environmental Protection (Noise) Policy 2019.*
- *The considerations are also part of regulatory requirements regarding noise, as stated in Chapter 4, Part 2 of the Environmental Protection Regulation 2019.*

As such, further information is requested regarding the noise and blasting performance, as well as effects on receiving environment.

Action:

You are requested to provide a noise assessment for the proposed development which includes the following, at a minimum:

- a) The individual point source emission characteristics (dB(A) for equipment, LAeq, adj, T and MaxLpA,T for cumulative site emissions).*
- b) Cumulative noise emissions resulting from the site area.*
- c) How noise emissions will be avoided, minimised or otherwise managed in accordance with the noise management hierarchy in the Environmental Protection (Noise) Policy 2019.*
- d) Whether the development will contribute to background noise creep in the local area.*

- e) *Whether the development can comply with the noise quality objectives of the Environmental Protection (Noise) Policy 2019 at all sensitive receptors. Residential and commercial sensitive receptors also must be included.*
- f) *Whether the development is conducive to the following environmental values of the Environmental Protection (Noise) Policy 2019:*
 - *The qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems.*
 - *The qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to sleep, study or learn, and be involved in recreation (including relaxation and conversation).*

Response:

As outlined in Section 2.5 of the Environmental Assessment Report (Attachment 4 of the Planning Assessment Report), it is anticipated that the default noise criteria specified in the *CCAA Guideline – Assessment and Control of Environmental Noise Emissions from Quarries – Queensland March 2015* will be applied to the proposed operation. However, more stringent noise criteria can be adopted if necessary.

AS3671 states approximate 10 dB(A) noise reduction through a façade with 10% open area. Thus approximately 7 dB(A) noise reduction through a façade with 20% open area. A typical 1200x1800 sliding window relates to approximately 10% open area. A large 2100x2300 sliding glass door represents approximately 20% open area. Thus, 7dB(A) noise reduction is conservatively adopted based upon a large sliding glass door in the affected façade. Openings larger than 20% open area are unlikely to be necessary for ventilation. For a typical sliding glass window in the open position a 10dB(A) noise reduction would be expected.

Considering the proposed operating hours and a noise attenuation of 7 dB(A) through an open window as described above, the most stringent Acoustic Quality Objectives assessed external to residential dwellings are:

- 7am to 6pm: LAeq (1 hour): 42 dB(A) external (35 internal + 7 sound transmission loss)
- 6am to 7am: LAeq (1 hour): 37 dB(A) external (30 internal + 7 sound transmission loss)

Therefore, for the proposed hours of operation, if the Department of Environment Science ('DES') are not inclined to follow the recommendations of the *CCAA Guideline* (which were developed in consultation with DES), the relevant noise limits to protect the existing noise environmental values for the area are:

- 37dBA LAeq adj,T for the period from 6:00am to 7:00am; and
- 42dBA LAeq adj,T for the period from 7:00am to 6:00pm.

It is our understanding that these noise limits were applied to a recently approved extractive industry operation (EA reference: P-EA-100380307). This operation had a separation distance of approximately 500m whilst the proposed operation has a separation distance of approximately 1.7km. Therefore, it is requested that the above mentioned noise limits are applied as part of EA conditions.

We confirm that pursuant to the DA Rules, this letter and the attachments provided comprise a full response to all of the items raised in the Information Request letter issued by SARA. It is therefore requested that SARA continue with their assessment of the application.

Yours faithfully

Groundwork Plus Pty Ltd



Sam Lyons
Senior Town Planner

Enc/s:

Attachment 1 – Traffic Assessment

Attachment 2 – Environmental Management Plan

Attachment 1

Traffic Assessment

Technical Memorandum

To:

Sam Lyons
Senior Town Planning Consultant
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From

Chris Hewitt
Associate Director/Principal Civil Engineer
McMurtrie Consulting Engineers
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1 Introduction

McMurtrie Consulting Engineers (MCE) has been engaged by Galilee Crushing to respond to information requests issued by both North Burnett Regional Council (NBRC) and the State Assessment and Referral Agency (SARA) with regards to a proposed quarry adjacent to Paradise Dam.

The site is located on Paradise Road, Coringa QLD 4621, on land described as Lot 17 on CK1566, which is adjacent to Paradise Dam. The intended use of the site is a quarry with a production of up to 1,000,000 tonnes per annum, which will service the upcoming Paradise Dam reconstruction.

Figure 1 shows the projected production rates for the operation of the quarry, as supplied by the quarry operator. As can be seen, a peak production rate of 80,000 tonnes per month is anticipated.

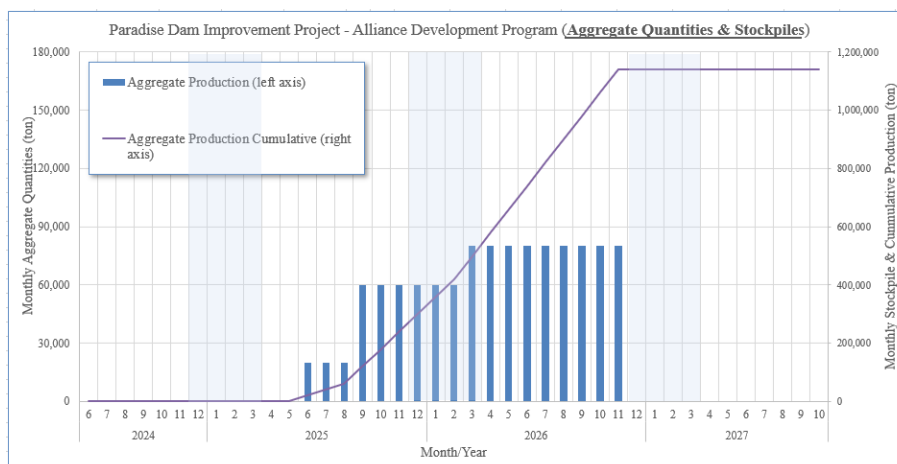


Figure 1 - Production projections

[Source: Blackwater Quarries]

2 Development Traffic

2.1 Traffic Generation

Based on the proposed 1,000,000 tonne/annum quarry production limit which is a 'worst case scenario' as material could potentially be delivered via conveyor and other means taking trucks off the road.

It is expected that approximately 87 truck movements in/out (assuming a 33 tonne payload via 4 axle truck and dog) per day will be generated. Over a 12 hour day, this equates to **15 heavy vehicle trips** (7 in and 7 out rounded up) generated per hour by the quarry export operations. To service 87 truck movements over a 12 hour working period, an estimated 8 staff are required, with an additional 6 support staff estimated to service the quarry operation. Conservatively assuming 2 employees per vehicle results in an additional **14 peak hour light vehicle trips** (7 in in AM peak and 7 out in PM peak), which are likely to occur in the same hour as the opening and closing hours of the quarry.

2.2 Impacts on the Road Network

It is understood that an overarching approval is in place for the reconstruction of Paradise Dam, which has allowed for the import of quarry materials to the site from external sources. With this in mind, it can be reasonably inferred that by sourcing quarry materials closer to the construction site, any impacts on the road (state and local) network originally covered by this overarching approval would be significantly reduced.

In any case work to address the impacts of external construction traffic has already commenced with the first package of works, which will include the upgrade of 10 kilometres of Paradise Dam Road which leads to the dam. Road construction activities will include pavement realignment, bitumen surfacing, widening of vertical crests, drainage enhancements, line marking and signage.

The second road upgrade package will replace a low-level crossing at Degilbo Creek with a higher-level bridge, improving its resilience to flood events, with the third package upgrading including the intersection of the Bruce Highway and Booyal-Dallarnil Road.

As such it can be reasonably concluded that analysis on roads and intersections external to the haul route are not required and assessment should only be limited to the haulage route itself, that is only between the quarry and the dam.

2.3 Impacts on the State Controlled Road Network

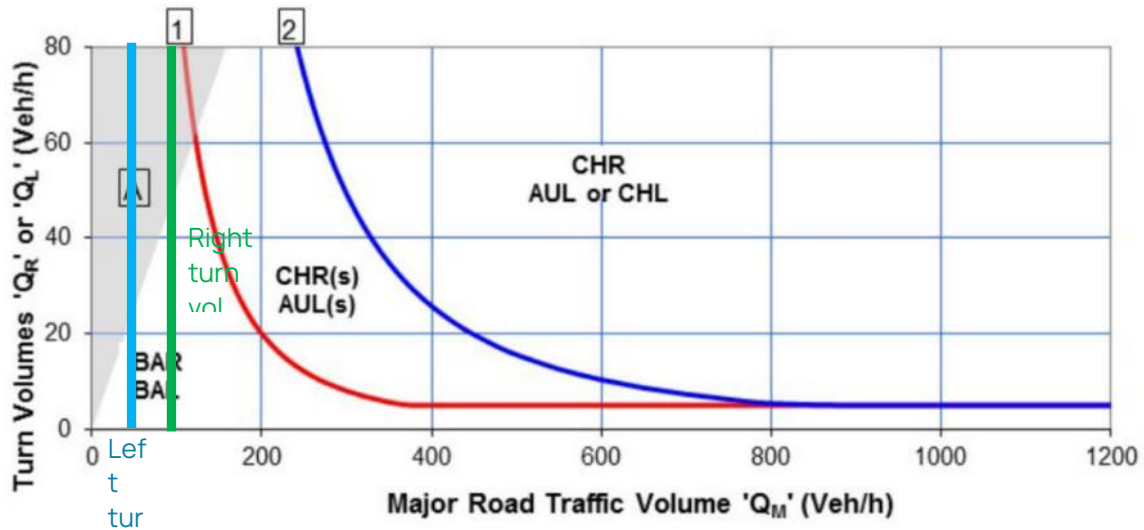
The nearest State Controlled Road that provides access to the site is Booyal – Dallarnil Road, some 16.77km distance from the site as determined by the NVHR Route Planner Tool. The below Table 1 presents the traffic census data for the nearest location to the intersection with Paradise Dam Road.

Table 1 - Future forecast background traffic

Site ID	AADT Segment		Base Data Year	Base Year (2021) AADT				10 Yr. GR %	Background AADT (2023)			
	Start (km)	End (km)		Gaz	% HV	A-Gaz	% HV		Gaz		A-Gaz	
									Total	HV	Total	HV
477 Booyal - Dallarnil Road												
120792	0	18.18	2021	402	28.9%	392	19.8%	4.5%	439	127	428	85

Given only the staff movements (7 in in AM and 7 out in PM peak hourly movements) will utilise the State Controlled Road network (arguably less with car-pooling), and conservatively assuming all in

movements are from the south (Biggenden or Childers via Isis Highway and Booyal-Dallarnil Road), turn warrant comparison has been completed – refer to Figure 2. The additional development volume on the State Controlled network accounts for less than 2% of the projected 2023 AADT. It is expected that this will be negligible in nature due to the relatively short duration of the project with the intersection capable of catering for turning traffic in excess of 80 vph as a BAR/BAL alone.



(a) Design Speed ≥ 100 km/h

Figure 2 - AM Turn Warrant Assessment – Paradise Dam Rd / Booyal – Dallarnil Rd Intersection

As shown in Figure 3, a BAR/AUL(s) is already available at the intersection and therefore no further turn treatments are required.



Figure 3 - Site layout plan & haul route

2.4 Traffic Distribution

All trips generated by the operation of the quarry will be new heavy vehicle trips to and from the reconstruction site traversing the haul route only.

It is expected that the only trips external to the reconstruction site will be that of the quarry operation staff and truck drivers, which are conservatively assumed to be 7 trips per peak period.

As discussed in Section 2.2, it is expected that the impacts of staff movements would be significantly reduced as compared to a case that assumes importing of quarry materials from an external source, as would be expected by the overarching approval and an additional 7 light vehicle movements in each peak is considered insignificant when compared with other construction traffic.

3 Haul Route

The proposed haul route between the quarry site access and the reconstruction site is shown below in Figure 4, consisting of 675m of rural unsealed two way single lane road and 658m of rural sealed two way two lane road. Both roads are local government owned.

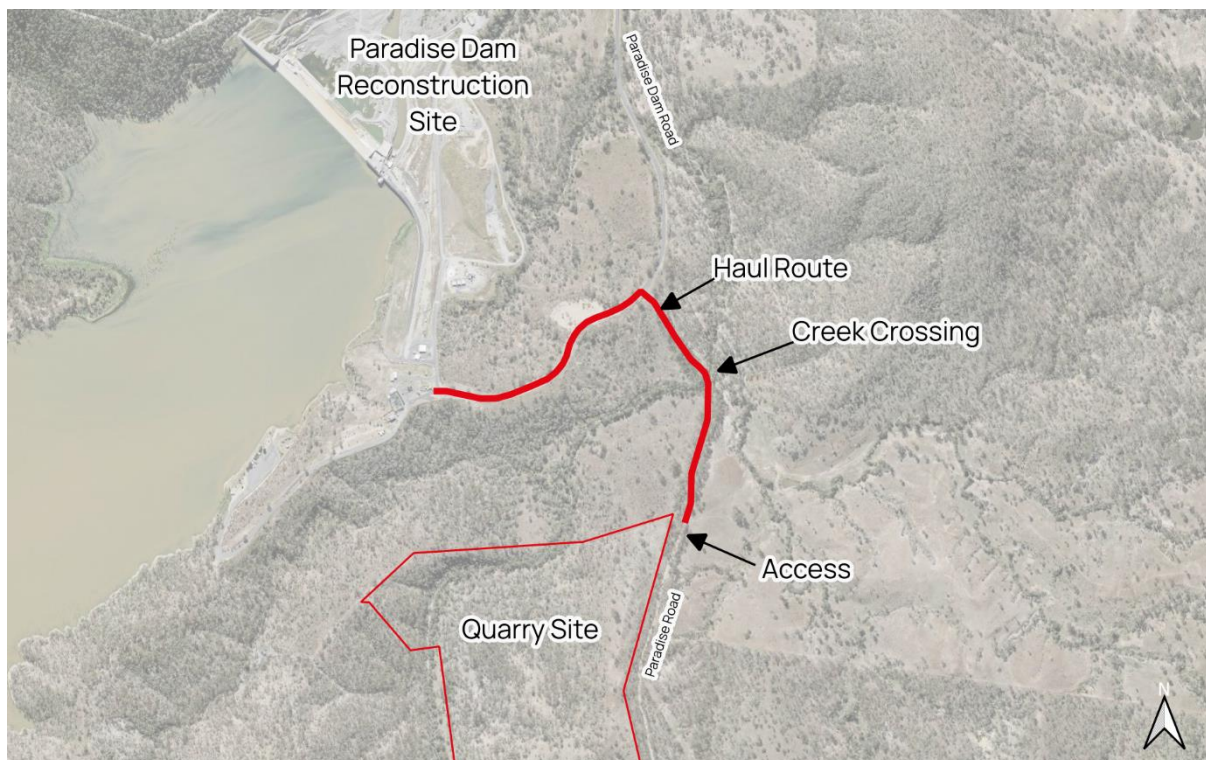


Figure 4 - Site layout plan & haul route

The section of Paradise Road north of the creek crossing has an unsealed travel lane (two way one lane) of 4m width on a 6m formation (i.e. 1m shoulder width). The section of Paradise Road south of the creek crossing has an unsealed travel lane (two way one lane) of 3.5m width on a 5m wide formation (i.e. 0.75m shoulders). The section of Paradise Road through the crossing has an unsealed (on rock) travel lane (two way one lane) of 3.5m width without shoulders.

The section of Paradise Dam Road utilised as part of the Haul Route has a sealed width of 7m width (two way two lane). It is expected that this section would fall under the purview of the overarching approval.

3.1 Intersection

The intersection of Paradise Dam Road and Paradise Road is a three-way priority (give way) controlled intersection, with priority given to the Paradise Dam Road approaches. One lane in each direction of travel is provided on each approach to the intersection, with no turn treatments provided on any leg of the intersection.

A Turn Warrant Assessment has been carried out and it is recommended that a Basic Right-Turn Treatment (BAR) and Rural Basic Left-Turn Treatment (BAL) be provided at the intersection in accordance with Austroads Guide to Road Design Part 4A Section 7.5.1 and Section 8.2.1 respectively (Guide to Road Design Part 4A: Unsignalised and Signalised Intersections, 2021). Further information can be provided as part of an Operational Works Application (Roadworks). Refer to Figure .

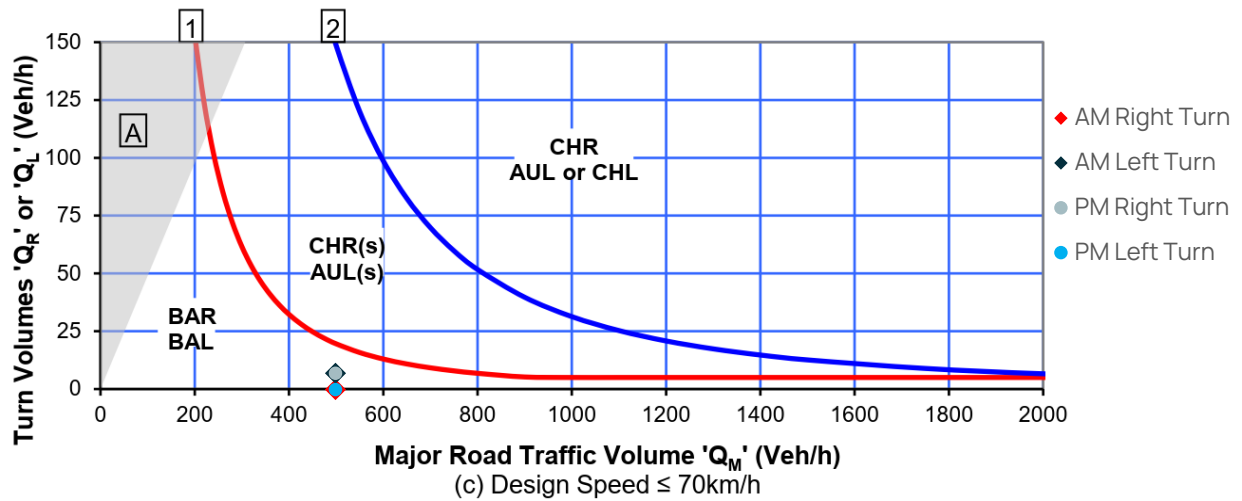


Figure 5 - Turn Warrant Assessment

Safe Intersection Sight Distance (SISD) has been assessed for this intersection, with the calculations provided in Appendix A. In order to provide for the existing vertical geometry of the road it is proposed that the posted speed limit be reduced to 60km/hr, with the resulting SISD being 126m on the northbound approach and 140m on the southbound approach, as shown in Figure .



Figure 6 - Safe Intersection Sight Distance (SISD)

Further information (e.g. signage details and speed reduction) can be provided as part of an Operational Works Application (Roadworks).

3.2 Creek Crossing

Vegetation clearing through the creek crossing is proposed to increase sight distances as shown in Figure , as well as installation of controls (give-way and storage bay holding northbound traffic) to manage vehicle movements through the crossing during construction. The amount of vegetation clearing is quantified in Figure 7 to provided Stopping Sight Distance (SSD). It is further noted that given the majority of traffic using this section will be trucks hauling between the reconstruction site and the quarry, significant mitigation of vehicle interaction hazards can be achieved through positive communications between vehicles.

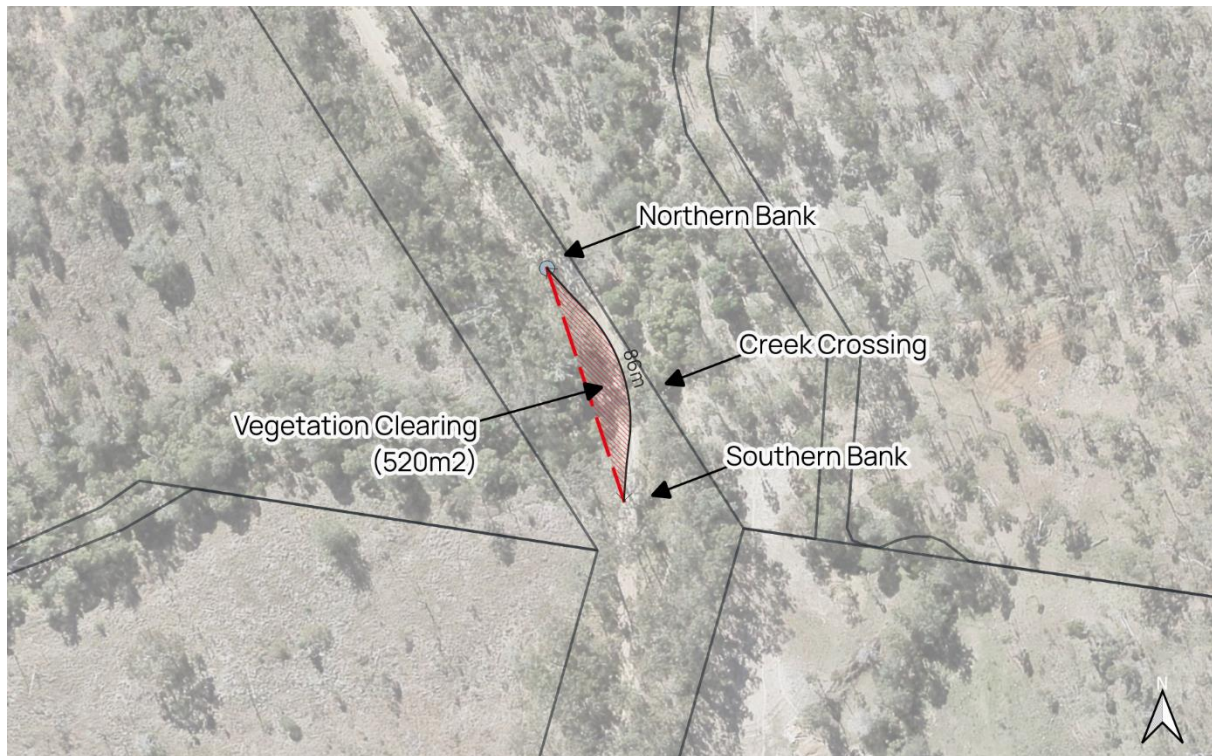


Figure 7 – Vegetation clearing through creek crossing

3.3 Paradise Road

Due to the limited width along the Paradise Road alignment, widening to an Unsealed Minor Rural Road standard as per NBRC R3004 Rev A is proposed to facilitate two-way traffic along all sections of the road (excluding the creek crossing). Improvement of the pavement will be required to facilitate the increased HV traffic throughout the construction period.

In lieu of a pavement impact assessment, it is recommended that the applicant enters into an infrastructure agreement with North Burnett Regional Council to complete upgrade/widening works as recommended by this report prior to commencement, with a pre-project dilapidation inspection (based on the newly upgraded works) and a post-project inspection to identify further works required to remediate the link to the pre-project standard.

Further information can be provided as part of an Operational Works Application (Roadworks), which will require pavement widening and strengthening by overlay to cater for the additional heavy vehicle volumes associated with the haulage task.

4 Summary

4.1 Conclusion

Based on the short duration and limited scope of the proposed development, it is expected that there will be minimal ongoing impact on the traffic operation of the surrounding road network. As discussed, the overarching assessment covering the reconstruction works has considered the impacts on the state road network due to the import of quarry materials, and therefore Sub-Items 2, 3, 4, 5 and 6 of Item 1 of the SARA Information Request are considered to be addressed by proxy.

The impacts of the proposed development on the haul route, which only includes local government roads, are seen to be managed by an implementation of controls (signage, vegetation clearing, speed reductions etc) as well as auxiliary roadworks (intersection turn-treatments, unsealed road widening and overlay).

4.2 Qualifications

This traffic memorandum has been prepared by MCE to support a Development Application for a extractive industry use. The site is located on Paradise Road, Coringa QLD 4621, on land described as Lot 17 on CK1566.

The analysis and overall approach were specifically catered to the requirement of this project and may not be applicable beyond this scope. For this reason, any other third parties are not authorised to utilise this report without further input and advice from MCE.

Chris Hewitt
Principal Civil Engineer

Appendix A: SISD Calculations

Table 2 - SISD - southern approach

Safe Intersection Sight Distance			
Southern Approach			
	3 sec	Observation time	$SISD = \left(\frac{D_T V}{3.6} \right) + \left(\frac{V^2}{254(d+0.01a)} \right)$
	2 sec	Reaction time	
D_T	5 sec	Decision time	
V	60 km/hr	Operating (85 th percentile) speed	
d	0.29 unitless	Coefficient of deceleration	
a	4 %	Longitudinal grade in direction of travel (+ve uphill, -ve downhill)	
SISD	126 m	Safe Intersection Sight Distance	

Table 3 - SISD northern approach

Safe Intersection Sight Distance			
Northern Approach			
	3 sec	Observation time	$SISD = \left(\frac{D_T V}{3.6} \right) + \left(\frac{V^2}{254(d+0.01a)} \right)$
	2 sec	Reaction time	
D_T	5 sec	Decision time	
V	60 km/hr	Operating (85 th percentile) speed	
d	0.29 unitless	Coefficient of deceleration	
a	-4 %	Longitudinal grade in direction of travel (+ve uphill, -ve downhill)	
SISD	140 m	Safe Intersection Sight Distance	

Appendix B: Site Photographs



Figure 3 - Photograph looking west on Paradise Dam Rd from Paradise Rd



Figure 4 - Photograph looking south on Paradise Rd from Paradise Dam Rd



Figure 5 - Photograph looking south on Paradise Rd from Quarry Site Access



Figure 6 - Photograph looking north on Paradise Rd from Quarry Site Access



Figure 7 - Photograph looking south on Paradise Rd through Creek Crossing from north of Creek Crossing

Attachment 2

Environmental Management Plan

Paradise Dam Quarry

Environmental Management Plan

Prepared for: Galilee Crushing & Civil Pty Ltd

Date: October 2023

File Reference: 2718_610_001

DOCUMENT CONTROL

PROJECT / DETAILS REPORT

Document Title:	Paradise Dam Quarry Environmental Management Plan
Principal Author:	Jack Wallace
Client:	Galilee Crushing & Civil Pty Ltd
Reference Number:	2718_610_001

DOCUMENT STATUS

Issue	Description	Date	Author	Reviewer
0	Environmental Management Plan	April 2023	J. Wallace	Y. Dowling
1	Amended Stormwater Management Plan – Attachment 2	October 2023	J. Wallace	S. Lyons

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DRAWING

Conceptual Quarry Design and MSES (Drawing No. 2718.DRG.001)

ATTACHMENTS

- Attachment 1 Annual Environmental Performance Review
- Attachment 2 Stormwater Management Plan Drawing

1 Introduction

1.1 Background

Galilee Crushing & Civil Pty Ltd ('GCC') intends to operate the Paradise Dam Quarry on land located at Paradise Road, Coringa QLD 4621, properly described as Lot 17 on CK1566 (herein referred to as the 'site' as shown in **Figure 1 – Aerial Photo and Cadastre**). The site will provide construction materials to the Paradise Dam Improvement Project.

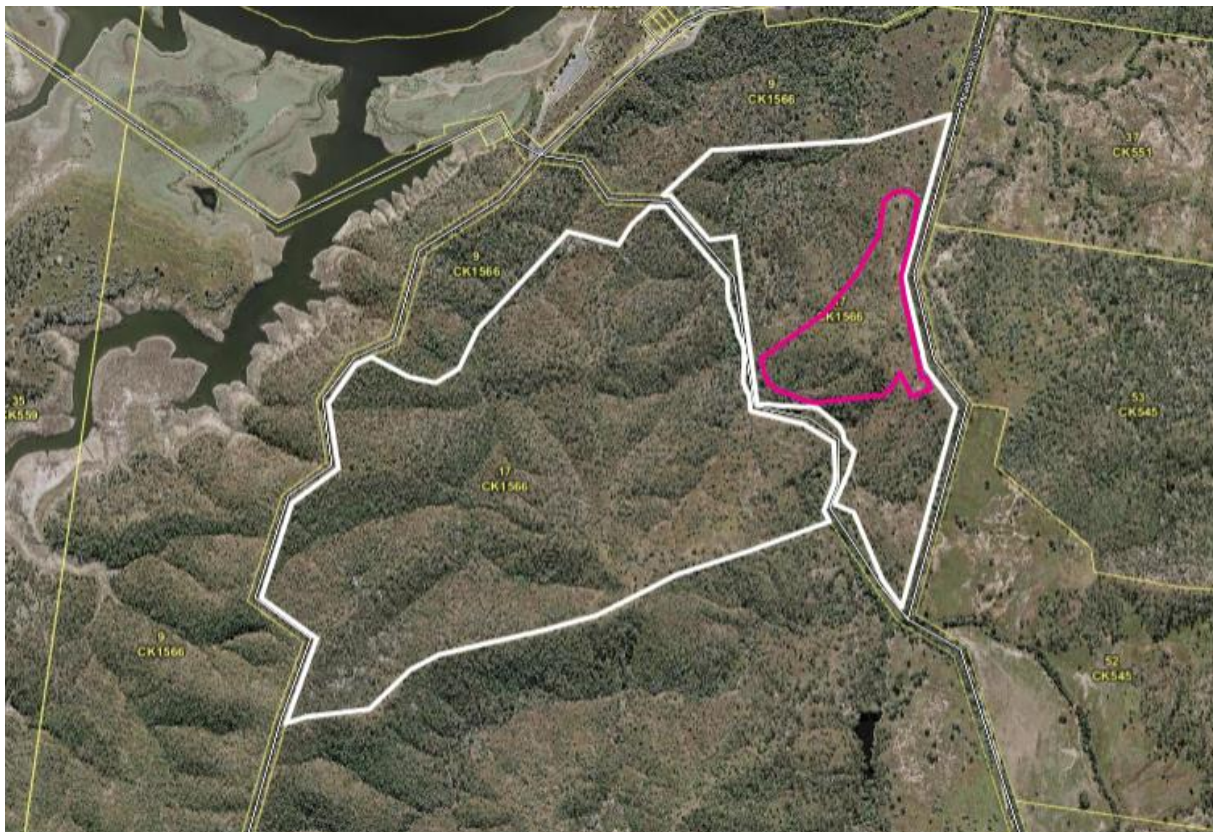


Figure 1 – Aerial Photo and Cadastre

(Figure reprinted from The State of Queensland (2023))

The activity constitutes the following prescribed Environmentally Relevant Activities ('ERAs') in accordance with the *Environmental Protection Regulation 2019* ('EP Reg'):

- ERA 16 Threshold (2)(b) – Extracting, other than by dredging, in a year, more than 100,000t but less than 1,000,000t; and
- ERA 16 Threshold (3)(b) – Screening, in a year, more than 100,000t but less than 1,000,000t.

Once granted, the site will be operated in accordance with a ('EA') issued by the Department of Environment and Science ('DES').

This Environmental Management Plan ('EMP') describes the site operations, the potential environmental impacts of these activities, and how any impacts may be mitigated or managed to achieve acceptable environmental outcomes for the activity.

1.2 Site Details

Table 1 – Site Details Summary provides a summary of the site location details.

Table 1 – Site Details Summary

Location	Paradise Road, Coringa QLD 4621
Access	Paradise Road, Coringa QLD 4621
Real Property Description	Lot 17 on CK1566
Total Site Area	Freehold
Tenure	1,512,510 sqm (151.251ha)
Local Authority	North Burnett Regional Council

1.3 Activity Overview

Included as **Diagram 1 – Conceptual On-Site Extractive Operations** are illustrations of the of the site development. The site operations will be developed in stages and will use standard extraction and screening methods. Below are the anticipated basic elements of the site operations:

- Clearing of vegetation and stripping of topsoil and overburden material using mechanical means (i.e. bulldozer or excavator) and stockpiling for incorporation into on-site rehabilitation works where required, or use in constructing stormwater control structures (e.g. perimeter banks);
- Drilling and blasting the exposed underlying rock to manageable size from the developed quarry benches to the quarry pit or bench below;
- Transferring raw material from the quarry face or pit floor to a designated crushing and screening plant using an excavator or front end loader into off road trucks;
- Crushing and screening the raw material using crushing and screening plant;
- Stockpiling the final products using the front-end loader and/or off-road haul trucks within the designated area required to be loaded into road trucks for transportation off-site; and
- Rehabilitating disturbed areas progressively once extraction is completed.

Operations will be supported by a range of ancillary building and structures including, but not limited to:

- Site office and amenities block, visitor car park, staff car park and truck parking area(s).
- Weighbridge, workshop, and truck wash down facility.
- Internal haul and access roads.

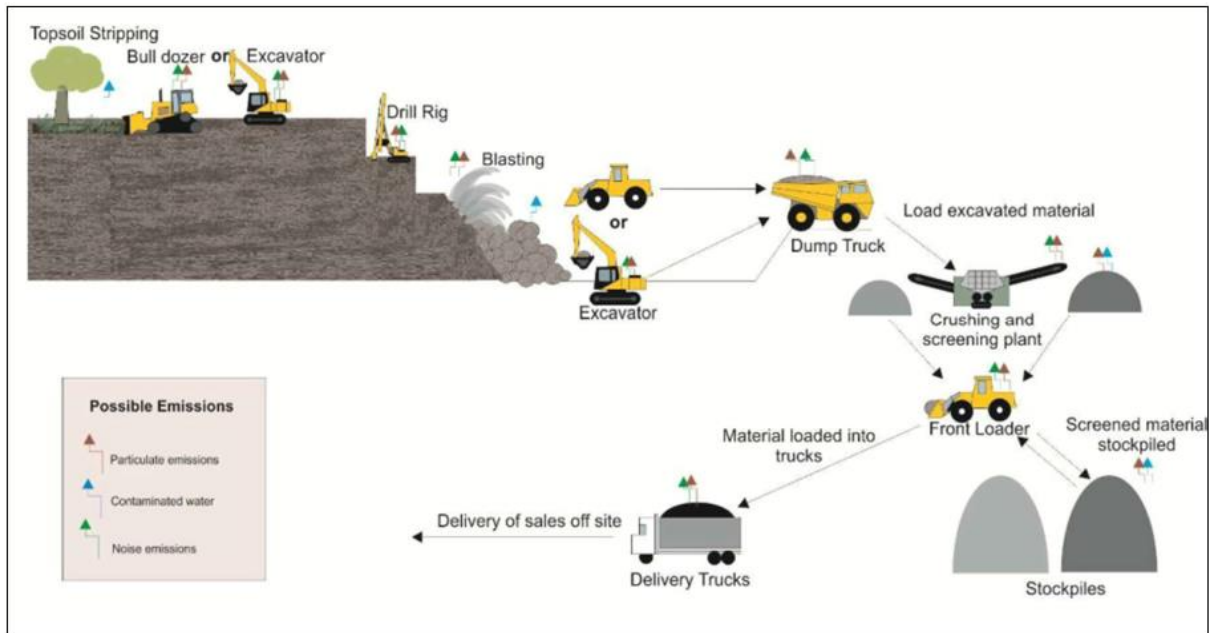


Diagram 1 – Conceptual On-Site Extractive Operations

1.4 Plant and Equipment

The types of major plant and equipment deployed on-site may include, but is not limited to:

- Bulldozer;
- Grader;
- Excavator;
- Drill rig;
- Off-road trucks;
- Front end loader;
- Fixed / mobile crushing and screening plant; and
- On-road haul trucks.

Machinery repairs and maintenance will be carried out on-site where practicable. Stationary equipment will generally be serviced in the field unless it is practical for the parts to be dismantled and transported offsite for repairs. Consumables (e.g., tyres, oils and greases) will be supplied by contractors and removed (including associated packaging) for disposal off-site in accordance with the requirements of the prevailing legislation and the local authority on a regular basis.

1.5 Hours of Operation

The proposed hours of operation for the quarry are:

- Loading and haulage: as per the hours of operation for the Paradise Dam Improvement Project for the duration of the project.
- Extraction and processing: 6:00am – 6:00pm, Monday to Saturday, no operations on Sundays or public holidays.
- Blasting: 9:00am – 3:00pm, Monday to Friday and 9:00am – 1:00pm, Saturdays.

1.6 Purpose of the EMP

This EMP has been prepared to provide written procedures for the site activities that:

- a) identify potential risks to the environment from the activity during routine operations and emergencies; and
- b) establish and maintain control measures that minimise the potential for environmental harm; and
- c) ensure plant, equipment and measures are maintained in a proper and effective condition; and
- d) ensure plant, equipment and measures are operated in a proper and effective manner; and
- e) ensure that staff are trained and aware of their obligations under the EP Act; and
- f) ensure that reviews of environmental performance are undertaken at least annually.

1.7 Relevant Legislation

In Queensland, the EP Act is the principal legislation for protecting the environment. The EP Act was assented on 1 December 1994 and was proclaimed on 1 March 1995. The object of the EP Act is to:

"protect Queensland's environment while allowing for development that improves that total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (ecologically sustainable development)".

The EP Act imposes a General Environmental Duty on corporation, government departments and individuals, in order to meet the primary objective (s319 of the EP Act). The duty relates to the notion that everyone must take all reasonable and practicable measures to prevent or minimise environmental harm. The general environmental duty is extracted below for reference:

319 General environmental duty

1. *A person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm (the **general environmental duty**).*

Note— See section 24 (3) (Effect of Act on other rights, civil remedies etc.).

2. *In deciding the measures required to be taken under subsection (1), regard must be had to, for example*
 - a) *the nature of the harm or potential harm; and*
 - b) *the sensitivity of the receiving environment;*
 - c) *the current state of technical knowledge for the activity; and*
 - d) *the likelihood of successful application of the different measures that might be taken; and*
 - e) *the financial implications of the different measures as they would relate to the type of activity.*

In addition, the EP Act states that it is an offence to cause environmental nuisance (s440 of EP Act), material environmental harm (s438 of EP Act), serious environmental harm (s437 of EP Act), and it is an offence to contravene a condition of an Environmental Authority (s430 of EP Act).

2 Policies and Procedures

2.1 Staff Training

All personnel, including contractors, are to be inducted on the environmental management requirements for the site and informed of the environmental management objectives and specifics of the EMP as well as obligations under the *Environmental Protection Act 1994*. Training may include awareness on impact minimisation measures, operational practices, maintenance measures, reporting, and individual responsibilities.

Site personnel are to be made aware of penalties if conditions of approval are breached and reporting requirements for incidents involving environmental nuisance and/or harm in accordance with the relevant environmental legislation. A record of all employee training is to be maintained on-site.

2.2 Communication

Communication must take place regarding environmental matters at the site between operational personnel, management and external stakeholders.

Internal communication mechanisms relating to environmental matters and potential impacts, objectives and targets, training and awareness, complaints and incidents, and suggestions for improvement may include, but shall not be limited to:

- Self-assessments and audits.
- Action requests, memos, noticeboards, etc.
- Environmental incident reporting.
- Environmental compliance monitoring and reporting.
- Inductions and environmental awareness training.
- Toolbox talks or verbal advice.
- Weekly construction meetings.
- Management reviews.
- Site meetings.

All external communications are to be undertaken by management. External communication mechanisms for environmental matters may include:

- Formal and informal correspondence with the administering authorities
- Formal correspondence with interest groups
- Community complaints and enquiries.

2.3 Complaint and Recording Response

All complaints received are to be reported to the Quarry Manager or delegate immediately.

The following details are to be recorded upon receipt of any complaint:

- Date and time the complaint was received.
- Name and contact details for the complainant when provided and authorised by the complainant.

- Nature of the complaint.
- Investigation undertaken.
- Conclusions formed.
- Actions taken.

The Quarry Manager is to liaise with any complainants to discuss the nature of the complaint and to determine a suitable resolution. Initial contact with the complainant is to be made within 24 hours of the complaint being received to initiate a resolution to the matter.

The administering authority may request additional monitoring to investigate any complaint of environmental nuisance received directly by the administering authority. A copy of any monitoring results must be provided within 10 business days to the administering authority.

2.4 Incident Response Procedure

2.4.1 Overview

The objective of this Incident Response Procedure is to ensure that any breaches of the EA, or incidents and activities that cause or threaten to cause serious or material environmental harm, are reported, investigated, and addressed to prevent recurrence or remedy harm caused. A diagrammatic overview of incidents procedure is provided in **Diagram 2 – Incident Response Procedure Overview**. The Quarry Manager will be responsible for ensuring that all employees at the site are familiar with the procedure for incidents procedures.

Environmental harm is defined under the EP Act as:

- any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.
- may be caused by an activity–
 - whether the harm is a direct or indirect result of the activity; or
 - whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors.



Diagram 2 – Incident Response Procedure Overview

2.4.2 Incident Awareness

When an employee becomes aware of an event resulting in the breach of an EA condition, or an incident with actual or potential environmental harm implications, the employee must report the incident to the Quarry Manager or delegate immediately (no more than 24 hours after becoming aware of the incident).

To demonstrate regard for the general environmental duty, all possible breaches of the EA should be reported to the administering authority as soon becoming aware of the matter, even if there is uncertainty as to whether a condition of the EA has been breached.

2.4.3 Notification

If the matters are an emergency, call 000.

Under Sections 320 to 320G of the EP Act, persons have a duty to notify the administering authority within 24 hours of becoming aware of any incidents or activities that cause or threaten to cause serious environmental harm or material environmental harm. In addition, the EA requires that any breach of a condition of the EA is reported no more than as soon as practicable within 24 hours of becoming aware of the breach.

The Quarry Manager must notify the administering authority via telephone and email within 24 hours of becoming aware of the incident. The contact details of the administering authority for notification purposes are as follows:

Department of Environment and Science

Phone: 1300 130 372 and select option 2 (during business hours of 8.30am to 5.00pm)

Email: PollutionHotline@des.qld.gov.au

Notification must include the following where known:

- Contact details for a site representative.
- Details of the affected land (e.g., site address, real property description, local government area, maps / plans of affected areas).
- EA reference number.
- Nature of the activity / circumstances that led to the incident.
- Timeframes for the event and when staff became aware (date and time).
- Event type (e.g., spill, fire, leaks, release, etc), source and environment affect (e.g. waterways, drains, land, etc).
- Details of any potential contaminants.
- Actions taken to resolve or remedy potential impacts.

All records of the incident or breach are to be stored at the site and made available to the administering authority upon request.

2.4.4 Investigation

All incidents are to be investigated. The investigations should include:

- determining what activities were being carried out at the time of the incident and any equipment involved.
- identifying whether equipment or activities on-site were the cause of the incident.
- determining what potential actions may be carried out to resolve the matter and/or minimise the likelihood of further impacts.

Corrective action is to be implemented and an assessment conducted to determine what actions are to be taken to remedy the matter and/or prevent a similar incident from occurring.

Where monitoring is required to investigate an incident (e.g., water quality monitoring), a suitably qualified person as identified under the EP Act must be engaged to perform the monitoring and interpret any results.

2.5 Record Keeping

All environmentally relevant documentation, including approvals, corporate policies, procedures, forms, records, and reports required to be kept as per this EMP or conditions of approval shall be available at the approved premises for a period of at least five (5) years, and must be available for inspection by an authorised person.

2.6 Monitoring

Any monitoring required by a condition of approval or by this EMP must be carried out by a suitably qualified person(s) as defined under the EP Act.

All instruments, equipment and measuring devices used for measuring or monitoring in accordance with a condition of approval must be calibrated and appropriately operated and maintained.

All analyses of samples must be carried out by a laboratory that has National Association of Testing Authorities ('NATA') certification, or an equivalent certification, for such analyses.

2.7 Periodic Review of Environmental performance and Continual Improvement

The EMP has been prepared for implementation as a continuous improvement program. The following key aspects of this EMP ensures continuous improvement results from the implementation of this EMP.

Commitment and Environmental Policy

Senior management are to commit to environmental performance through ensuring regulatory compliance, prevention of actual or potential environmental harm, and continuous improvement.

Planning

The EMP identifies environmental aspects associated with the site operations, such as potential impacts. EMP outlines the environmental objectives, performance targets and management measures for each environmental aspect.

Implementation

Implementation of the EMP outlines responsibilities, training requirements, communication procedures, and contingency plans. GCC will be responsible for ensuring additional implementation requirements are in place, such as preparing monitoring documentation, following procedures, and establishing communication pathways.

Checking

Monitoring of compliance will determine whether the environmental objectives are being met and will identify non-compliances. Additional actions that will check environmental performance include audits and review of the EMP.

Review

Reviews of environmental performance are to be undertaken at least annually and should review:

- any monitoring data produced under the conditions of the EA and any trends.
- any non-compliances reported, or complaints received, over the preceding 12 months and actions taken to achieve compliance / resolution.
- changes in site approval documents, legislation and standards.
- the suitability of the EMP against the site development.
- any measures that are proposed to be implemented over the coming 12 months to improve the environmental performance of the site.

A template for annual environmental performance reviews is included as **Attachment 1 – Annual Environmental Performance Review**.

The outcomes of all environmental performance reviews must be communicated to senior management for actioning as required.

The outcomes of all environmental performance reviews must be communicated to senior management for actioning as required.

The Quarry Manager may commission updates to this EMP as required to ensure that it meets the operational needs of the site. Periodic review of the EMP will ensure continuous improvement of the site environmental performance through adaption of management strategies to meet the changing needs of the site.

3 Potential Environmental Risks

3.1 Risk Assessment Methodology

The purpose of this assessment is to determine the site activities requiring ongoing management to reduce residual risk of potential environmental impacts. This risk assessment methodology has been adopted from the process for risk management as set out in Clause 6 of the *AS ISO 31000:2018 Risk management - Guidelines* (Standards Australia 2018). The risk assessment follows the following process:

- Risk Identification (source activity and potential impact).
- Risk Analysis (risk level = likelihood x consequence).
- Risk Evaluation (commentary on risk / management measures proposed).

The risk treatment outlines the controls / management measures that can be implemented to reduce the level of risk to as low as reasonably possible.

The risk analysis qualitative estimates the level of risk based on the likelihood of an environmental impact or event occurring (**Table 2 – Definitions of Likelihood**), and the consequences of the concurrence (**Table 3 – Definitions of Consequences**).

Table 2 – Definitions of Likelihood

Rating	Descriptor	Score
Rare	May occur only in exceptional circumstances	1
Unlikely	Could occur but doubtful	2
Possible	Might occur at some time in the future	3
Likely	Will probably occur	4
Almost Certain	Is expected to occur in most circumstances	5

Table 3 – Definitions of Consequences

Rating	Descriptor	Score
Negligible	Impacts not requiring any treatment or management action	1
Minor	Nuisance or insignificant environmental harm requiring minor management action	2
Moderate	Serious environmental impacts, readily manageable at low cost	3
Major	Substantial environmental impacts, manageable but at considerable cost and some disruption	4
Severe	Severe environmental impacts with major consequent disruption and heavy cost	5

The consequence and likelihood scores are plotted on the risk vs consequence matrix (**Table 4 – Risk Assessment Matrix**) and the final risk level assigned is a product of the likelihood and consequence scores, which equals the magnitude of the impacts. The higher the risk score, the higher the priority is for management.

Table 4 – Risk Assessment Matrix

Likelihood		Consequence				
		Negligible	Minor	Moderate	Major	Severe
		1	2	3	4	5
Almost Certain	5	5 Medium	10 High	15 High	20 Very High	25 Very High
Likely	4	4 Low	8 Medium	12 High	16 High	20 Very High
Possible	3	3 Low	6 Medium	9 Medium	12 High	15 High
Unlikely	2	2 Low	4 Low	6 Medium	8 Medium	10 High
Rare	1	1 Low	2 Low	3 Low	4 Low	5 Medium

Table 5 – Indicative Management Option for Each Risk Assessment Rating describes the possible actions required for each risk assessment rating.

Table 5 – Indicative Management Option for Each Risk Assessment Rating

Risk Rating	Risk Rating Scores	Indicative Management Option
Very High	17 – 25	Manage by implementing site management and emergency procedures, plant design controls and regular monitoring.
High	10 – 16	Manage by implementing site management procedures, specific monitoring and may require some operation/plant design controls.
Medium	5 – 9	Manage by implementing specific monitoring or response procedures.
Low	1 – 4	Manage by routine procedures, unlikely to need specific application of resources.

3.2 Environmental Risk Assessment

Activities associated with the ERAs which have the potential to cause environmental harm and/or nuisance and the potential impacts have been identified and tabulated. The inherent risk of the impacts occurring, and the residual risk following the implementation of management strategies, has then been assessed. Refer to **Table 6 – Inherent and Residual Environmental Risk Assessment** for the assessment.

Table 6 – Inherent and Residual Environmental Risk Assessment

Source Activity	Potential Impact	Inherent Risk Rating ²	Comments	Residual Risk Rating ³
AIR				
<ul style="list-style-type: none"> Clearing of vegetation and topsoil / overburden ahead of the extraction activity. Stockpiling of topsoil and overburden. Extraction and handling of raw materials (e.g., transfer of materials, processing, blending, stockpiling, transportation). Vehicle movements on unsealed roads and access tracks. 	Emission of dust to air impacting nearby sensitive receptors.	2 x 3 = 6 (Medium)	<p>There are limited sensitive receptors in the locality, with the nearest residence being over 1.5 km north of the operational area. In the absence of control measures, potential incidents associated with air emissions impacting nearby sensitive receptors is scored medium due to the setting of the site a rural locality with limited nearby receptors.</p> <p>Section 4.1 – Air Quality Management Plan contains control measures to minimise potential for air quality impacts. Residual risk is scored low as the likelihood of an incident occurring, and its consequences, are reduced through the implementation of control measures.</p>	2 x 2 = 4 (Low)

Source Activity	Potential Impact	Inherent Risk Rating ²	Comments	Residual Risk Rating ³
WATER				
<ul style="list-style-type: none"> Clearing of vegetation and topsoil. Stockpiling of topsoil and overburden. Extraction and handling of raw materials (e.g., transfer of materials, processing, blending, stockpiling, transportation). 	Release of contaminated water to the receiving environment.	3 x 3 = 9 (Medium)	<p>Stormwater runoff will interact with disturbed areas created through the development of site.</p> <p>Section 4.2 - Water Quality Management Plan provides control measures to manage potential impacts to waters from the site activities. The residual risk score is reduced to medium based on a possible likelihood and a moderate consequence which can be management in accordance with the measures in the EMP.</p>	2 x 3 = 6 (Medium)
WETLANDS				
<ul style="list-style-type: none"> Clearing of vegetation and topsoil. Stockpiling of topsoil and overburden. Extraction and handling of raw materials (e.g., transfer of materials, processing, blending, stockpiling, transportation). 	Release of contaminants to, or physical damage of, nearby wetlands.	2 x 3 = 6 (Medium)	<p>The site is not mapped as containing any VMA or HES Wetlands; therefore, direct impacts to wetlands are unlikely. The nearest mapped wetland is situated approximately 1km west of the operational area.</p> <p>Attachment 2 – Conceptual Quarry Stormwater Management Plan identifies the location of the discharge points from the sediment basins which are outside of the mapped wetland protection area.</p>	2 x 2 = 4 (Low)

Source Activity	Potential Impact	Inherent Risk Rating ²	Comments	Residual Risk Rating ³
GROUNDWATER				
<ul style="list-style-type: none"> Clearing of vegetation and topsoil. Extraction of raw materials. 	Impacts to groundwater quality or quantity.	2 x 3 = 6 (Medium)	<p>Based on drill hole data reported in October 2022, no groundwater was intercepted within the operational area on this site. Inherent risk of direct impacts is therefore low.</p> <p>Indirect impacts through release of contaminants which have the potential to be transported to groundwaters is scored medium, based on a possible likelihood. Section 4.2 - Water Quality Management Plan provides control measures includes measures for capture and treatment of surface waters that may interact with potential contaminants at the site that could impact groundwater. In addition, Section 4.3 - Hydrocarbon and Chemicals Management Plan provides measures for management of potential contaminants such as fuels.</p> <p>Risks of impacts to groundwater can be reduced to a lower score based on a decreased likelihood of an event occurring. The risk is reduced to a lower score however remains medium, which will require ongoing management through the implementation of this EMP.</p>	2 x 2 = 4 (Low)
	Impacts to GDEs	2 x 2 = 4 (Low)	There are no GDEs mapped as occurring within the operational area. While no on-site investigations of GDE have been completed, as outlined previously, the proposed maximum depth of extraction is 72 m AHD. This would maintain a 2m buffer above the depth of which has been conducted at the site within the operational area. As a result, changes to the quality or quantity of groundwater available to any GDEs in proximity to the site are	2 x 2 = 4 (Low)

Source Activity	Potential Impact	Inherent Risk Rating ²	Comments	Residual Risk Rating ³
			considered unlikely. Inherent risk is scored low as a result, which requires no application of specific management measures.	
NOISE				
<ul style="list-style-type: none"> Clearing of vegetation and topsoil / overburden ahead of the extraction activity. Stripping and stockpiling of topsoil, subsoils and overburden. Extraction and handling of materials (e.g., transfer of materials, stockpiling, transportation). Screening and processing of the materials. Vehicle movements on unsealed roads and access tracks. Plant and equipment use, including reverse beepers. Radio / UHF use. Alarms. 	Noise nuisance for nearby noise sensitive receptors.	3 x 3 = 6 (Medium)	<p>In the absence of any noise management measures, the site activities have the potential to influence the noise EVs of the locality. The site is in a rural setting with limited noise sensitive receptors in the locality, the nearest of which is a residence located over 1.5 km north of the operational area. The consequence is conservatively assessed as moderate resulting in an inherent risk of medium.</p> <p>Section 4.4 - Noise Management Plan contains control measures to minimise noise emissions from the site activities. Provided that GCC implement control measures for potential noise impacts residual risk can be reduced to low as the likelihood and consequence of an incident involving noise nuisance is reduced through the implementation of the above measures.</p>	2 x 2 = 4 (Low)

Source Activity	Potential Impact	Inherent Risk Rating ²	Comments	Residual Risk Rating ³
<ul style="list-style-type: none"> Blasting activities. 	Air blast overpressure and vibration nuisance for nearby sensitive receptors.	3 x 4 = 12 (High)	<p>The rural location of the site assists in reducing the number of sensitive receptors; however, blasting activities at the site inherently have the potential to cause air-blast overpressure and vibration impacts for sensitive receptors.</p> <p>Section 4.5 - Blasting Management Plan includes measures for management of blasting activities at the site. A key measure is that only suitably experienced and qualified blasting personnel shall be employed or contracted to provide blasting services. This will ensure that all blasts are designed and carried out in a controlled manner to ensure that the relevant blast conditions and Australian Standards are adhered to.</p> <p>Provided that the Blasting Management Plan is implemented, and only suitably qualified persons are engaged to undertake blasting activities at the site, the residual risk is reduced to a lower level as the likelihood of an incident occurring is reduced.</p> <p>The residual risk rating is scored medium, which will require ongoing management measure to be applied as outlined in the EMP.</p>	2 x 3 = 6 (Medium)
WASTE				
<ul style="list-style-type: none"> Vegetation clearing. Storage and disposal of residual waste (i.e., general, and regulated waste). 	Improper disposal of wastes.	3 x 3 = 9 (Medium)	<p>Section 4.6 - Waste Management Plan details measures for management of waste at the site, with reference to the requirements of the <i>Waste Reduction and Recycling Act 2011</i> ('WRR Act').</p> <p>Provided GCC implement the nominated control measures the residual risk of a potential incident involving waste is reduced.</p>	2 x 2 = 4 (Low)

Source Activity	Potential Impact	Inherent Risk Rating ²	Comments	Residual Risk Rating ³
LAND				
Handling of chemicals and fuels on-site.	Release of hydrocarbons and fuels to land.	3 x 4 = 12 (High)	<p>In the absence of controls, the inherent risk of handling fuels and chemicals is high due to an increased likelihood of potential release if handling and storage activities are unmanaged.</p> <p>Section 4.3 - Hydrocarbon and Chemicals Management Plan provides management measures for handling and storage of hydrocarbons and chemicals to reduce the potential impacts to land associated with spills and/or leaks. Through implementation of the nominated controls, residual risk is reduced to a lower level as the likelihood and consequence of an incident occurring is reduced. Through the implementation of the management measures outlined in the EMP.</p>	2 x 3 = 6 (Medium)
Post-closure implementation and management of the site rehabilitation.	Failure to achieve rehabilitation milestones in disturbance areas at the cessation of the activities.	3 x 4 = 12 (High)	<p>In the absence of management measures to assist in site rehabilitation, landforms created through the extraction activities have the potential to impact upon environmental values of the surrounding areas following cessation of the extractive industry activities.</p> <p>Section 4.7 - Rehabilitation Management Plan of the EMP provides guidance for progressive and final rehabilitation of the site.</p> <p>Residual risk is reduced to a lower level as the likelihood of failure of final rehabilitated landforms is reduced through the implementation of these measures.</p>	2 x 3 = 6 (Medium)

Source Activity	Potential Impact	Inherent Risk Rating ²	Comments	Residual Risk Rating ³
Bushfires	Fire threatening harm and damage to property.	4 x 4 = 16 (High)	<p>The site is mapped as containing bushfire prone areas in accordance with the State Planning Policy.</p> <p>Section 4.8 - Bushfire Management Plan provides measures to assist in minimising fire risks and impacts at the site.</p> <p>Even through application of controls, fire risks can remain an ongoing threat for all landowners with major consequences, which at times are unpredictable. As a result, residual risk is scored high which requires application of ongoing controls.</p>	3 x 3 = 9 (Medium)

4 Environmental Management Plans

4.1 Air Quality Management Plan

4.1.1 Objective

The activity will be operated in a way that protects the environmental values of air.

4.1.2 Purpose

This Air Quality Management Plan has been prepared to control potential air quality impacts occurring as a result of land disturbance necessary for the site operations. The *Environmental Protection Act 1994* and the associated *Environmental Protection (Air) Policy 2019* provide the legislation and regulatory controls for management of emissions to the atmosphere.

4.1.3 Performance Targets

- No environmental nuisance complaints in relation to air quality impacts (i.e., unmitigated emissions of dust, odours or light) associated with the site activities.
- Dust and particulate matter emissions generated by the activities must not cause exceedances of Dust and particulate matter not exceeding the levels shown in **Table 7 – Air Quality Parameters** when measured at the sensitive receptor.

Table 7 – Air Quality Parameters

Contaminant	Measure	Target Upper Limit
Dust Deposition	Deposition rate	120 mg/m ² /day
PM ₁₀	Concentration	50 µg/m ³ averaged over 24 hours
	Concentration	25 µg/m ³ annual average
Total Suspended particles (TSP)	Concentration	90 µg/m ³ averaged over 24 hours

4.1.4 Management Strategies

GENERAL

- Ensure sufficient on-site water supply is available for dust suppression.
- Apply good housekeeping practices.

WORK AREAS / TRAFFICABLE AREAS

- Limit high dust generating activities (e.g., removal of topsoil/overburden and blasting) to periods of favourable weather conditions.
- Dampen down (approx. rate of 2 litres/m²/hour) work areas, stockpiles, access roads and other hardstand areas by water spraying when visual surveillance indicates excessive dust generation.

4.1 Air Quality Management Plan

- Restrict vehicle movements to designated routes to the extent practicable.
- Enforce speed limits on internal roads.
- Pave and/or seal high trafficable access roads and/or tracks, where practicable.
- Maintain road surfaces in good condition.
- Prevent and clean up any raw material / product spillages or dust accumulation on driveways or sealed roads.
- Use dust extraction systems on drill rigs where possible, or wet down drilling via water sprays.

PROCESSING PLANT

- Use water sprays and/or dust collection systems at transfer points.
- Use shielding and/or windbreaks where possible.
- Maintain equipment in accordance with the original equipment manufacturers' specifications.
- Dampen materials prior to transport/handling.

STOCKPILES

- Limit the height of any stockpiles to <6m, where practicable.
- Regularly water stockpiles to keep down dust emissions.
- Apply additional water sprays to stockpiles during high wind conditions.

TRANSPORT OF MATERIALS

- Ensure that incoming and outgoing truckloads of materials are covered during transport.
- Ensure that truck bodies and trailers leaving the premises are clean, focusing on draw bars and tail gates, to prevent material spillages causing dust nuisance and being tracked onto external roads.

4.1.5 Monitoring

Daily visual surveillance must be undertaken by all employees to ensure dust generation on-site is controlled appropriately.

Dust and particulate monitoring must be undertaken at the request of the administering authority in accordance with the relevant conditions of the EA. Dust and particulate monitoring must be undertaken to investigate any complaint of environmental nuisance caused by dust and/or particulate matter.

When requested to undertake monitoring, monitoring results are to be provided to the administering authority following completion of the monitoring event. Monitoring shall be carried out at a place(s) relevant to the potentially affected dust sensitive place and must include:

- for a complaint alleging dust nuisance, dust deposition.
- for a complaint alleging adverse health effects caused by dust, PM₁₀ over a 24hr averaging time.

The monitoring must determine the extent to which the air quality achieves the performance targets specified in **Table 7 – Air Quality Parameters**.

4.1 Air Quality Management Plan

Methods of monitoring for the specified parameters are as follows:

DUST DEPOSITION

- *Australian Standard (AS) 3580.10.1 Methods for sampling and analysis of ambient air – Determination of particulates – Deposited matter – Gravimetric method* (Standards Australia 2016).

PM₁₀

- *AS 3580.9.6 Determination of Suspended Particulate Matter-PM10 High Volume Sampler with Size Selective Inlet-Gravimetric Method* (Standards Australia 2015).
- *AS 3580.9.9 Methods for sampling and analysis of ambient air Determination of suspended particulate matter – PM₁₀ low volume sampler– Gravimetric method* (Standards Australia 2017).
- Any alternative method of monitoring PM₁₀ which may be permitted by the Air Quality Sampling Manual as published from time to time by the administering authority.

The monitoring results must be provided within 10 business days to the administering authority upon its request.

4.1.6 Contingency Plan

Any complaint received in relation to dust impacts is to be managed by the Quarry Manager in accordance with **Section 2.3 – Complaint Recording and Response**.

Any exceedance of the approved limits is to be reported to the administering authority in accordance with **Section 2.4 – Incident Response Procedure**, and corrective action is to be identified and undertaken in consultation with the administering authority. In the event that air quality monitoring (dust and/or particulate matter) determines an exceedance of the approved limits (noted under *Performance Targets*), the Quarry Manager, in consultation with management, may engage the services of a suitably qualified person to determine additional management strategies to mitigate impacts.

Additional air quality monitoring should be undertaken as necessary to determine the effectiveness of any additional management strategies employed in response to exceedance of approved limits.

4.2 Water Quality Management Plan

4.2.1 Objective

The activity will be operated in a way that protects the environmental values of water.

4.2.2 Purpose

This Water Quality Management Plan has been prepared to control potential environmental impacts occurring as a result of land disturbance necessary for the site operation.

4.2.3 Performance Targets

- To ensure all prescribed water contaminants (Schedule 10 EP Reg) including suspended solids, turbid waters, chemicals, lubricants, or fuels are not released from the site.
- Stormwater runoff from disturbed areas of the site, generated by (up to and including) a 24-hour storm event with an Average Recurrence Interval ('ARI') of 1 in 5 years must be retained on site or managed to remove contaminants prior to release.
- An uncontrolled release from site should only occur under exceptional circumstances such as the site receiving a rainfall event larger than a 24-hour storm event with an ARI of 1 in 5 years.
- Water that is controlled released from the site is to comply with conditions of the EA.
- The only contaminants to be released to waters are treated stormwater runoff waters in accordance with the water quality criteria specified in the EA.

4.2.4 Management Strategies

A drawing outlining the stormwater management plan for the site is included as **Attachment 2 – Conceptual Quarry Stormwater Management Plan**.

SEDIMENT BASINS

- Within 120 hours of the most recent rainfall event, the required design capacity of the upper settling volume is available for capture and storage of stormwater runoff from the next rainfall event¹.
- Sediment basins must be designed to capture sediment up to a depth of 0.5 m within the base of the pit. An indicator marker is to be installed at the base of the pit to identify the level of sediment accumulated.
- Site features such as extraction pits and drop cuts may be utilised as on-site storage¹.
- Sediment is to be removed to return the sediment basins to full capacity on a periodic basis or when the sediment level is approaching the sediment storage capacity.
- Coagulants or flocculants may be used to treat stormwaters in sediment basins; however, their use must be in accordance with the manufacturer's dosage specifications to ensure that they do not cause environmental harm to receiving waters.

DRAINAGE CONTROL

- Clean stormwater runoff external to the operational areas must be prevented from entering disturbed areas through use of catch drains or flow diversion drains.

¹ DES, (2021). *Guideline: Stormwater and environmentally relevant activities*. Accessed 13 April 2023 via https://environment.des.qld.gov.au/_data/assets/pdf_file/0028/89119/pr-gl-stormwater-guideline-era.pdf

4.2 Water Quality Management Plan

- Drainage inlets / outlets (inclusive of sediment and waste baskets) are to be maintained at all times.
- Grass filter strips are to be retained for surface water discharge locations.

SEDIMENT CONTROL

- Sediment is to be trapped within the site, and as close as practicable to its source.
- Materials, whether liquid or solid, removed from sediment control devices during maintenance or decommissioning, must be disposed of in a manner that does not cause ongoing soil erosion or environmental harm.
- Site exit points must be appropriately managed to minimise the risk of sediment being tracked onto sealed, public roadways.

LAND CLEARING

- No land clearing shall be undertaken unless preceded by the installation of adequate drainage and sediment control measures, unless such clearing is required for the purpose of installing such measures, in which case, only the minimum clearing required to install such measures shall occur.
- Land clearing to be undertaken in conjunction with development of each stage of the quarry.
- Bulk tree clearing must occur in a manner that minimises disturbance to existing ground cover (organic or inorganic).
- Disturbance to natural watercourses (including bed and banks) and their associated riparian zones must be limited to the minimum practicable extent and be accompanied by the relevant approval.
- Prior to land clearing, areas of protected vegetation, and significant areas of retained vegetation must be clearly identified for the purposes of minimising the risk of unnecessary land clearing.
- All reasonable and practicable measures must be taken to minimise the removal of, or disturbance to, those trees, shrubs and ground covers (organic or inorganic) that are intended to be retained.
- All land clearing must be undertaken in accordance with the Development Approval and applicable legislation.
- Land clearing is limited to the minimum practicable extent during those periods when soil erosion due to wind, rain or surface water is possible.

STOCKPILE MANAGEMENT

- Wherever possible, protect stockpiles from wind, rain, concentrated surface flow and excessive upslope stormwater surface flows.
- Long term stockpiles such as topsoil and overburden should be vegetated to achieve a minimum 70% coverage.
- Locate stockpiles at least 5 m from any hazardous area, retained vegetation or concentrated drainage line.
- Locate stockpiles up-slope of an appropriate sediment control system.
- Establish flow diversion systems (e.g., diversion bunds, channels) must be established immediately up-slope of stockpiles.

SITE MAINTENANCE

- General site litter is to be cleaned up on a weekly basis, prior to anticipated heavy rainfall and after significant rainfall events (>25mm/24hours) (IECA n.d.).
-

4.2 Water Quality Management Plan

- All erosion and sediment control measures, including drainage control measures, must be maintained in proper working order at all times during their operational lives.
- Sediment removed from places of sediment deposition must be disposed of in a lawful manner that does not cause ongoing soil erosion or environmental harm.

4.2.5 Monitoring

VISUAL INSPECTIONS

A summary of recommended inspection, performance criteria and responses that are to be performed on site is provided in **Table 8 – Inspection and Maintenance of Stormwater Control Devices**.

Table 8 – Inspection and Maintenance of Stormwater Control Devices

Inspection Area	Frequency	Performance Criteria	Response
Sediment Basins / Water Storages	<ul style="list-style-type: none"> • Quarterly as a minimum. • After each rain event, particularly focusing on the entry and exit points, if damage has occurred then make necessary repairs. • Prior to, and immediately after, periods of sustained site shut down (i.e., greater than 30 days). 	Basin capacity sufficient to retain a 24-hour storm event with an ARI of 1 in 5 years.	Desilt basin to ensure design capacity of the upper settling volume is available
Drainage lines including catch drains, contour drains and diversions.	Prior to and following rainfall events.	Erosion in areas adjacent to water conveyancing structures.	Eroded areas are to be treated as soon as practicable.
		Overtopping of water conveyancing structures (identified by the scouring of the drain batters perpendicular to the direction of flow).	The drain is to be cleaned of sediments and returned to the original design specifications.
Spill response stations.	Following use.	Equipment is properly maintained.	<ul style="list-style-type: none"> • Maintain adequately stocked spill kits. • Replace used spill response equipment as required.
Waste storage areas	Daily.	No litter within drainage lines.	Collect or loose litter to prevent transport

Inspection Area	Frequency	Performance Criteria	Response
			off-site via drainage controls.

WATER QUALITY MONITORING

- All site water releases are to be monitored in accordance with the parameters and at the frequencies shown in the **Table 9 – Surface Water Release Limits**. No controlled releases are to occur unless the site waters comply with the specified limits.
- Water quality monitoring must be in accordance with the methods prescribed in the current edition of the administering authority's *Monitoring and Sampling Manual* (DES 2018).
- Water and sediment samples must be representative of the general condition of the water body or sediments.
- All determinations must employ analytical practical quantification limits of sufficient sensitivity to enable comparisons to be made against water quality objectives/triggers/limits relevant to the particular water or sediment quality characteristic.
- All monitoring devices must be calibrated and maintained according to the manufacturer's instruction manual.

Table 9 – Surface Water Release Limits

Quality Characteristic		Limit	Limit Type	Minimum Monitoring Frequency
Total Solids	Suspended	≤ 50	Mg/L	Prior to any discharge and daily during any discharge
pH		6.5	8.0	Prior to any discharge and daily during any discharge

4.2.6 Contingency Plan

After any identification of incident or failure, the source/cause is to be immediately located and the following measures implemented (IECA (Australasia) n.d.):

- Excessive sediment build-up on-site – collect and dispose of material, then amend up-slope drainage and/or erosion control measures as appropriate to reduce further occurrence.
- Severe or excessive rill erosion – investigate cause, control up-slope water movement, re-profile surface, cover dispersive soils with a minimum 100mm layer of non-dispersive soil, and stabilise with erosion control measures and vegetation as necessary.
- Poor vegetation growth or soil coverage – plant new vegetation and/or mulch as required.
- Sediment control failure – replace and monitor more frequently. Regular failures may mean that the sediment control location, alignment or installation may need to be amended.
- Scour / erosion of bunds will be required to be stabilised.

If a release of contaminants occurs off-site not in accordance with the conditions of the EA, the administering authority must be notified, and an investigation conducted to identify appropriate action to resolve the issue to the fullest practicable extent. Refer to **Section 2.4 – Incident Response Procedure**.

4.3 Hydrocarbon and Chemicals Management Plan

4.3.1 Objective

The activity is operated in a way that protects the environmental values of land, air and water including soils, subsoils, landforms and associated flora and fauna.

4.3.2 Purpose

The Hydrocarbons and Chemicals Management Plan has been prepared to control the potential for spills or leaks from chemicals and hydrocarbons associated with the site activities.

4.3.3 Performance Targets

- No land contamination from the site activity that would require registration on the Contaminated Land Register ('CLR').
- No serious spills of oils, greases, fuels, or other hazardous chemicals.
- No preventable release of hydrocarbons and chemicals to the environment.

4.3.4 Management Strategies

GENERAL

- Any chemical handling and storage must be designed and installed in accordance with the most recent edition of *AS 1940 - The storage and handling of flammable and combustible liquids* (Standards Australia 2017a), as a minimum.
- Maintain the chemical and fuel storage areas in a neat and tidy condition.
- Safety Data Sheets ('SDS') of chemicals used on site shall be kept in a register at the site office.
- Chemicals and fuels in containers of greater than 15 litres must be stored within a secondary containment system.
- Bunding must be constructed of material which is impervious to the material being stored.
- Bunds are to be kept in good condition (e.g., no cracks, gaps, or leaks)
- Roofed storage facilities are to be provided where possible.
- Stormwater captured within bunding is to be removed as soon as practicable and disposed of as contaminated water (if required).
- Empty hydrocarbon and chemical containers are to be stored with closures in place on hardstand or within a bunded area.
- A collection sump must be provided in the floor of the bunding to facilitate the removal of liquids.
- All pipe work in the bunded area must be directed over the bund wall and not through it.
- Where vehicle access to the bunded area is required, access must be by way of a rollover bund.
- Refuelling, equipment maintenance and cleaning of vehicles is to be undertaken within a designated area such as hardstand or sealed area, capable of capturing and containing contaminants.
- Spills are to be cleaned up immediately with appropriate spill kits. Spillages must not be cleaned up in a way that releases wastes, contaminants or other materials to any stormwater drainage systems, roadside gutters, or waters.
- All plant, equipment and vehicles are to be serviced and maintained in the designated workshop, hardstand and/or concrete areas.
- All new employees are to be inducted on the use of handling of chemicals used on-site.

4.3 Hydrocarbon and Chemicals Management Plan

SPILL KITS

- Maintain appropriate spill kits and personal protective equipment at locations known to all employees (e.g., refuelling locations, chemical storage facilities, mobile equipment).
- Ensure employees are familiar with, and trained in, the use of proper spill clean-up procedures and always maintain a copy of the procedures at the site.
- Undertake regular spill kit inventory checks to ensure sufficient materials and supplies are available in the event of a spill.

DISPOSAL

Refer to **Section 4.6 - Waste Management Plan** for details regarding correct methods of disposal of waste materials. In general:

- Hydrocarbon contaminated materials are to be appropriately disposed of at a licensed facility.
- If the material is a Regulated Waste (as defined under the legislation) it must be transported and disposed of by a licensed contractor.
- Oily waste materials, including liquid hydrocarbons, should be segregated from general wastes for disposal off-site by a licensed contractor.
- Records are to be kept on disposal of waste for all regulated waste materials.

4.3.5 Monitoring

Areas where handling of hydrocarbons and chemicals occur (e.g., refuelling, or minor on-site servicing) shall be regularly inspected by the Quarry Manager.

The Quarry Manager must ensure that adequate resources are available for management of hydrocarbons and chemicals, and is to ensure that all personnel carrying out service and maintenance activities are appropriately qualified to do so.

4.3.6 Contingency Plan

In the event of any spill, implement the steps outlined in **Diagram 3 – Spill Response Procedure**. Remediation of land contamination may be required in the event of more serious incidents; however, GCC are to consult with a suitably qualified person to determine the nature and extent of any contamination remediation process.

Any incident caused by handling of hydrocarbons or chemicals which has the potential to cause environmental harm must be reported and investigated by the Quarry Manager or delegate in accordance with **Section 2.4 – Incident Response Procedure**, and corrective action is to be identified and undertaken.

SPILL RESPONSE PROCEDURE

1. INITIAL ASSESSMENT



For emergencies call 000

Advise the Site Supervisor immediately.

Assess the following:

- What is the type and volume of the spill
- What is the source?
- What PPE is required according to the SDS?
- Are third parties needed to contain and manage the spill?

2. ISOLATE



Cease work in the area immediately.

Declare the area a no go zone and cordoned off where possible.

Avoid movement of plant/equipment into the area.

3. STOP THE SOURCE



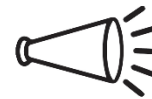
Locate and contain the source of the spill.

Stop the spill (e.g. close valves / taps, rotate damaged / punctured drums, plug leaks or gaps).

Protect water (e.g. block drains and outlets, apply drain covers, divert spills via spill berms, sandbag or similar).

Contain the spill use temporary bunds and spill kits, or absorbent materials (e.g., clay, rags).

4. NOTIFY



If a spill threatens or causes environmental harm, DES must be notified.

Spills within waterways pose a risk of environmental harm. DES must be notified, and professional assistance sought regarding clean-up operations.

5. CLEAN UP / REMOVAL



- Remove the spill by shovels and / or earthmoving equipment.
- Move plant and equipment to allow removal of the spill.
- Dispose contaminated soils / materials off-site via an approved regulated waste transporter to a licenced disposal facility.
- Do NOT dispose of any contaminated materials on-site.
- Do NOT use water or liquids to wash the spill area.

Spills within a waterway are to be cleaned up in accordance with advice provided by third parties, including DES.

6. INVESTIGATE



Investigate the cause of the spill and conduct a review of the on-site management measures to prevent a recurrence.

Carry any further notification or reporting requirements if directed to do so by DES.

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Diagram 3 – Spill Response Procedure

4.4 Noise Management Plan

4.4.1 Objective

The activity will be operated in a way that protects the environmental values of the acoustic environment.

4.4.2 Purpose

This Noise Management Plan has been prepared to control potential nuisance impacts that may occur as a result of noise associated with the site operations.

The EP Act and the associated *Environmental Protection (Noise) Policy 2019* provide the legislation and regulatory controls for management of noise in relation to protection of EVs.

4.4.3 Performance Targets

- No environmental nuisance complaints relating to the site operations.
- Site operations shall comply with the noise criteria specified in the **Table 10 – Noise Limits**.

Table 10 – Noise Limits

	Monday to Saturday				Sundays and Public Holidays		
	6am – 7am	7am – 6pm	6pm - 10pm	10pm - 6am	7am – 6pm	6pm - 10pm	10pm - 7am
	Noise measured at the sensitive place						
LAeq, adj, T	37	42	35	30	No audible noise		
MaxLpA T	-	-	-	49	No audible noise		
	Noise measured at the commercial place						
LAeq, adj, T	55	55	55	55	55	55	55

4.4.4 Management Strategies

- Hours of operation are to be:
 - Loading and haulage: as per the hours of operation for the Paradise Dam Improvement Project for the duration of the project.
 - 6:00am to 6:00pm Monday to Saturday.
 - No operations on Sundays or public holidays.
- Mobile plant (e.g., front-end loaders, dozers, haul trucks, excavators) are to be fitted with broadband reversing alarms where possible to mitigate potential nuisance from tonal characteristics.
- Stockpile areas should be designed to allow forward-in, forward-out movement of road haulage trucks to avoid a requirement for external trucks to reverse on-site.
- Ensure a site layout that enables product delivery and handling in such a way that reduces the need for reversing.
- Fixed engines, pumps and compressors are to be enclosed where practicable.

4.4 Noise Management Plan

- Ensure all site equipment, machinery and vehicles are serviced in accordance with the original equipment manufacturers' specifications as a minimum.
- Ensure all modern mobile plant (e.g., front-end loaders, excavators, off-road trucks) is fitted with effective exhaust silencers.
- Equipment and machinery are to be shut down when not in use.
- Unnecessary revving of mobile or stationary motors and engines is to be avoided.
- Ensure that equipment at the site is used for the intended purpose.
- Ensure that any extraneous noises are rectified.
- Maintain haul roads and hardstand surfaces in good condition (e.g., free of potholes, rills and product spillages) and with suitable grades.
- Avoid the use of compression braking on product delivery trucks entering the site.

4.4.5 Monitoring

The Quarry Manager must:

- ensure regular surveillance of the site to qualitatively assess noise generation from the operations.
- initiate noise monitoring if requested by the administering authority, or as otherwise deemed necessary, to investigate a noise complaint.

Any monitoring must be in accordance with the most recent version of the administering authority's *Noise Measurement Manual* (DES 2020a). When required by the administering authority, noise monitoring must be undertaken, and the results notified within 14 days to the administering authority. Monitoring must include:

- $L_{Aeq, adj, T}$
- Background noise (Background) as $L_{A 90, adj, T}$
- $MaxL_{pA, T}$
- the level and frequency of occurrence of any impulsive or tonal noise
- atmospheric conditions including wind speed and direction
- effects due to extraneous factors such as traffic noise
- recording of location, date and time of measurements.

4.4.6 Contingency Plan

Any complaint received in relation to noise impacts is to be managed by the Quarry Manager in accordance with **Section 2.3 – Complaint and Recording Response**.

Should the outcomes of noise monitoring undertaken upon the request of the administering authority determine an exceedance of the specified limits, the administering authority notification is to be carried out in accordance with **Section 2.4 – Incident Response Procedure**, and corrective action is to be identified and undertaken.

Where necessary, advice should be sought from a suitably qualified person as to whether additional management measures are required to minimise noise. Additional noise monitoring must be undertaken where necessary to determine the effectiveness of the additional management strategies

4.5 Blasting Management Plan

4.5.1 Objective

The activity will be operated in a way that protects the environmental values of the acoustic environment.

4.5.2 Purpose

Blasting will be required to fragment rock to a manageable size that can be transported and fed into the on-site crushing and screening plant.

Blasting practice has the potential to generate excessive noise and vibration impacts that may cause nuisance for sensitive receptors.

Section 440ZB of the *Environmental Protection Act 1994* provides the legislation for blasting.

4.5.3 Performance Targets

- Blasting activities must not exceed the limits for peak particle velocity and air blast specified in the EA (extracted as **Table 11 – Blasting Limits** for reference) when measured at any sensitive place or commercial place.

Table 11 – Blasting Limits

Blasting criteria	Blasting limits
Airblast overpressure	115 dB (Linear) Peak for 9 out of 10 consecutive blasts initiated and not greater than 120 dB (Linear) Peak at any time.
Ground vibration peak particle velocity	5 mm/s peak particle velocity for 9 out of 10 consecutive blasts and not greater than 10 mm/s peak particle velocity at any time.

4.5.4 Management Strategies

- Only suitably experienced and qualified blasting personnel are to be employed or contracted to provide blasting services.
- Blasting must be carried out in accordance with the current edition of the administering authority's *Guideline: Noise and vibration from blasting* (DES 2020b) and with *AS 2187.2-2006 Explosives - Storage and use - Use of explosives* (Standards Australia 2006).
- Unless prior approval is obtained from the administering authority; blasting is only permitted during the hours of:
 - 9am to 3pm Monday to Friday.
 - 9am to 1pm on Saturdays.
 - Blasting is not permitted at any time on Sundays or public holidays.
- Handling, transport and use of explosives is to be carried out in accordance with the requirements of *AS 2187.2-2006 Explosives - Storage and use - Use of explosives* (Standards Australia 2006), and the *Mining and Quarrying Safety and Health Act 1999* (MQSH Act) and associated Regulation.
- The maximum instantaneous charge or charge mass per delay is to be limited to the lowest possible level.

4.5 Blasting Management Plan

- A blast plan is to be prepared for each blast, containing blast hole layout, initiation sequence, charging, stemming type and height, charge weight and any other design element, required to inform good blasting practice.
- Blast areas are to be dampened down prior to blasting to minimise dispersion of dry and fine materials where practicable, or where it is identified as a source of potential dust nuisances.

4.5.5 Monitoring

Monitoring of blasting activities must be undertaken by a suitably qualified person in accordance with the administering authority's guideline *Noise and Vibration from Blasting* (DES 2020b) and the relevant *AS 2187.2-2006 Explosives - Storage and use - Use of explosives* (or most recent version) (Standards Australia 2006).

Monitoring is to be conducted around the quarry to confirm that the airblast and ground vibration levels do not exceed the criteria specified. Blasts are to be randomly selected or monitored on a fixed schedule (e.g., five continuous blasts).

The method of measurement and reporting of vibration levels must comply with Appendix J of *AS 2187.2-2006 Explosives – Storage and use – Use of explosives* (Standards Australia 2006). Measurements are to be conducted by suitably trained personnel using appropriate equipment. Equipment is to be calibrated on a regular basis in accordance with the manufacturer's recommendations or other appropriate standards.

Where a nuisance complaint regarding air blast overpressure or ground vibration is received, consideration is to be given to available monitoring results and locations, and if required or advantageous, a monitor is to be installed at an appropriate location for the next five blasts to assess compliance, or when requested by the administering authority.

All monitoring and reporting is to be undertaken by a person or body possessing both the qualifications and the experience appropriate to perform the required measurements.

4.5.6 Contingency Plan

Any complaint received regarding nuisance associated with blasting at a sensitive receptor must be recorded and investigated by the Quarry Manager in accordance with **Section 2.3 – Complaint Recording and Response**.

In the event that blast monitoring determines an exceedance of the approved limits, the Quarry Manager is to notify the administering authority in accordance with **Section 2.4 – Incident Response Procedure**. Advice should be sought from a suitably qualified person as to whether additional management measures are required to minimise impacts from blast. Subsequent blasts are to be monitored to ensure effectiveness of any additional measures implemented

4.6 Waste Management Plan

4.6.1 Objective

Any waste generated, transported, or received as part of carrying out the activity is managed in a way that protects all environmental values.

4.6.2 Purpose

This Waste Management Plan has been prepared with reference to the conditions of approval to ensure wastes produced on-site are appropriately managed.

The type of wastes that may be generated at the site may include, but are not necessarily limited to the following:

- Regulated wastes (e.g., batteries, oil filters, waste oil/hydrocarbons and containers, oil/water emulsions and tyres).
- Scrap metal and used or faulty parts and equipment.
- General waste such as food waste, packaging and consumables.
- Green waste.

The *Waste Reduction and Recycling Act 2011* ('WRR Act') nominates a waste and resource management hierarchy in a preferred order of adoption. The hierarchy is as follows:

- (a) *AVOID unnecessary resource consumption*
- (b) *REDUCE waste generation and disposal*
- (c) *RE-USE waste resources without further manufacturing*
- (d) *RECYCLE waste resources to make the same or different products*
- (e) *RECOVER waste resources, including the recovery of energy*
- (f) *TREAT waste before disposal, including reducing the hazardous nature of waste*
- (g) *DISPOSE of waste only if there is no viable alternative.*

4.6.3 Performance Targets

- Implement the WRR Act waste management hierarchy.
- Maintain a record of wastes requiring off-site disposal.
- Meet all legislated waste tracking requirements in accordance with the EP Reg.
- No unlawful disposal of wastes on or off-site.

4.6.4 Management Strategies

WASTE AVOIDANCE

Waste avoidance relates to preventing the generation of waste or reducing the amount of waste generated. Reasonable and practicable measures for achieving waste avoidance may include, but are not necessarily limited to:

- Input substitution (using recyclable materials instead of disposable materials, for example using oil delivered in recyclable steel drums instead of non-recyclable plastic containers).
- Increased efficiency in the use of raw materials, energy, water, or land (purchasing consumables in bulk (large containers) rather than in small quantities).
- Improved maintenance and operation of equipment (keep equipment in good working order to reduce wear and overhaul).
- Undertaking an assessment of waste minimisation opportunities from time to time.

4.6 Waste Management Plan

WASTE REUSE

Waste re-use refers to re-using waste, without first substantially changing its form. Reasonable and practicable measures for reusing waste may include, but are not necessarily limited to:

- Recovering and separating solvents, metals, oil, or components or contaminants and reusing separated solvents for degreasing plant and equipment.
- Applying waste processing fines to land in a way that gives agricultural and ecological benefits (using fine sediments in rehabilitation activities).
- Using overburden for constructing bunds and landforming.
- Reusing silt/sediment on-site to the maximum practicable extent.

WASTE RECYCLING

Waste recycling refers to treating waste that is no longer useable in its present form and using it to produce new products. Reasonable and practicable measures may include, but are not necessarily limited to:

- Recovering oils, greases, and lubricants for collection by a licensed oil recycling contractor, recovering, separating, and recycling packaging (including paper, cardboard, steel and recyclable plastics).
- Recycling used plant and equipment to the maximum practicable extent.
- Finding alternatives to disposal of non-recyclable materials (using conveyor belts for noise attenuation, mudflaps, ute tray liners).
- Providing suitable receptacles and storage areas for collection of materials for recycling.

ENERGY RECOVERY FROM WASTE

This refers to recovering and using energy generated from waste. Due to the scale of the operation, energy recovery is not considered viable.

WASTE DISPOSAL

This refers to disposing of waste which cannot otherwise be reused, recycled or used for energy recovery. Reasonable and practicable measures may include, but are not necessarily limited to:

- Regulated wastes must be transported and disposed of in accordance with the *Environmental Protection Regulation 2019*.
- Disposal to a licensed waste disposal facility (i.e., landfill or transfer station).

WASTE STORAGE

- Waste storage containers or areas are to be provided and located at safe and convenient locations at the site.
 - Any storage containers are to be identified with the type of wastes which may be disposed of in each container.
 - Carry out a daily housekeeping and litter collection to ensure loose litter is contained and disposed of appropriately.
-

4.6 Waste Management Plan

- Whenever possible use fencing, enclosures, cover and other physical barriers to prevent inadvertent transport of litters off-site.

REGULATED WASTE

Regulated wastes are defined in the EP Reg. Waste management areas must include a dedicated section for regulated wastes, which must be stored within sealed containers within a bunded area in accordance with Australian Standards and the following minimum requirements:

- All regulated wastes will be transported off-site by a suitably licensed commercial transporter with an ERA 57 Regulated Waste Transport (or equivalent) approval.
- To assist in the collection and transfer of regulated wastes, designated regulated waste bins, drums and skips must be used. Where possible these regulated waste storage containers should be located at the work location where the waste is being generated and then returned to the designated regulated waste storage areas for storage prior to offsite disposal or recycling.
- Dedicated regulated waste storage areas must be provided to prevent the mixing of regulated wastes with other stored material or with incompatible hazard classes. Wastes must only be deposited into designated areas within the applicable storage area.
- Storage areas for regulated wastes must be constructed in accordance with AS 1940-2004 or an equivalent Australian Standard.
- Any regulated waste stored at the site should be recorded in a Waste Management Register or similar.
- Where possible, regulated waste stores must be lockable to prevent access by unauthorised persons.
- As soon as practicable, remove and dispose of all regulated waste to a licensed waste disposal facility or recycling facility using a licenced contractor.

TRACKABLE WASTE

Certain regulated wastes as defined under Schedule 9 of the EP Reg are to be tracked in accordance with the requirements of Section 11 of the EP Reg. **Diagram 4 – Waste Tracking Requirements (Paper Based System)** provides an overview of the waste tracking requirements for each stakeholder in the transport and handling of trackable waste chain.

4.6.5 Monitoring

All site personnel shall be responsible for ensuring wastes are stored and removed from the site on a regular basis.

The Quarry Manager must:

- undertake ongoing visual inspections to ensure the waste management hierarchy is being effectively implemented.
- undertake daily visual inspections of baled materials to identify and remedy any damage to covering materials.
- ensure that waste treatment measures are implemented at the site.

4.6 Waste Management Plan

- ensure that waste receptacles are provided, and that temporary waste storage areas are signed; recycling bins are emptied when full and materials which may cause land contamination are not disposed of on the site.
- keep a record of regulated waste generated at the site, treatment and disposal methods, approved contractors for transporting and disposing of waste and the location of the facility for accepting the waste.

4.6.6 Contingency Plan

Where a non-compliance is identified, a review of the Waste Management Plan is to be undertaken to determine areas for improvement and additional staff training on waste management procedures and waste handling is to be undertaken.

Where GCC becomes aware that putrescible, trackable or regulated wastes have been inappropriately disposed of, or an incident occurs involving potential or actual environmental harm, the incident must be notified to the administering authority in accordance with **Section 2.4 – Incident Response Procedure**, and corrective action is to be identified and undertaken.

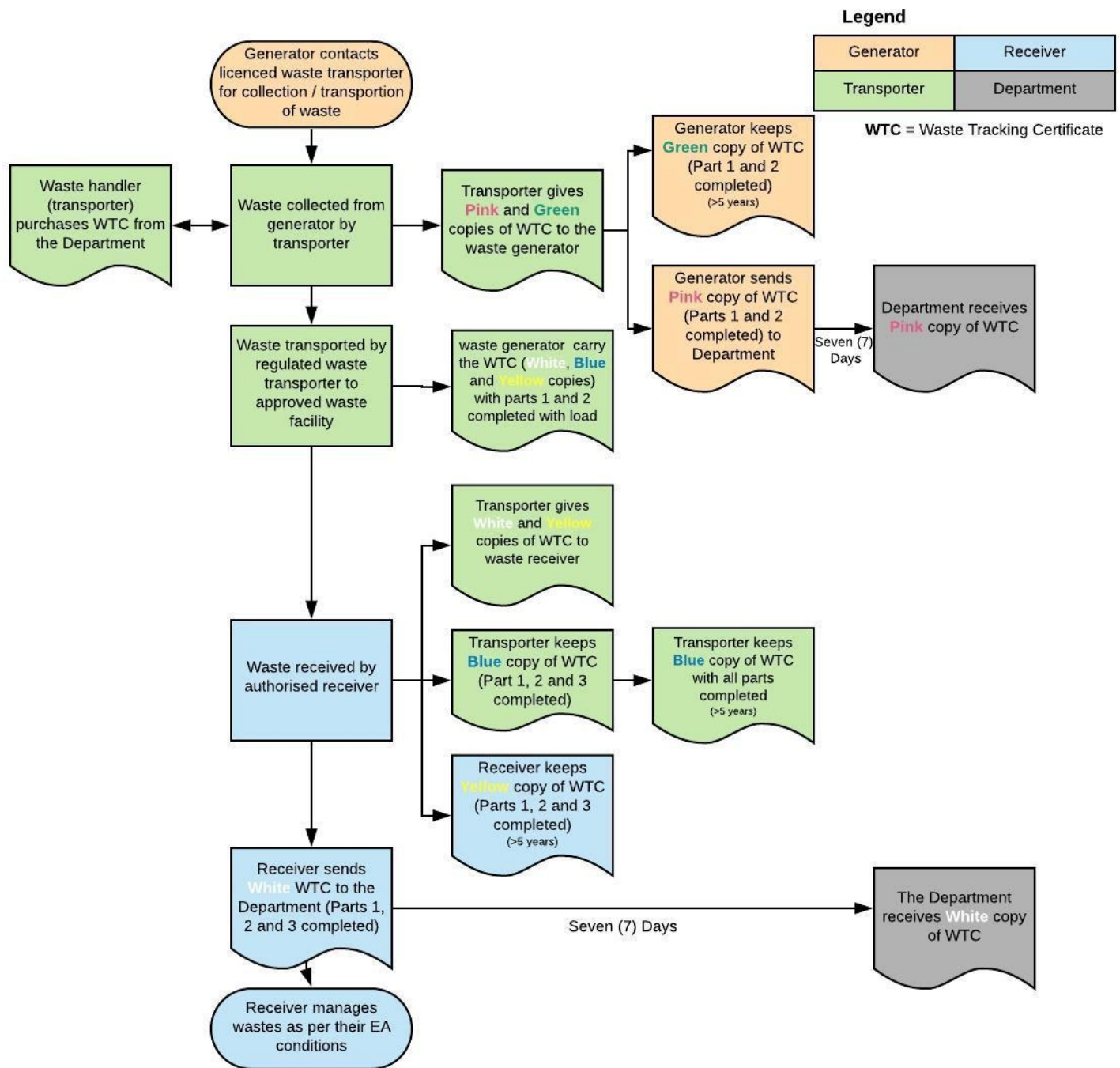


Diagram 4 – Waste Tracking Requirements (Paper Based System)

4.7 Rehabilitation Management Plan

4.7.1 Objective

The activity is operated in a way that protects the environmental values of land including soils, subsoils, landforms and associated flora and fauna.

4.7.2 Purpose

This Rehabilitation Management Plan has been prepared to assist with site rehabilitation.

4.7.3 Performance Targets

- Limit land disturbance to that which is necessary at any one time.
- Identify any land contamination and implement appropriate remediation or management where necessary.
- Land that has been disturbed for activities must be rehabilitated in a manner such that:
 - suitable native species of vegetation for the location are established and sustained for earthen surfaces.
 - potential for erosion is minimised.
 - the quality of water released from the site, including seepage, does not cause environmental harm.
 - potential for environmental nuisance caused by dust is minimised.
 - the water quality of any residual water body does not have potential to cause environmental harm.
 - the final landform is stable and protects public safety.
- Rehabilitation of disturbed areas must take place progressively as works are staged and new extraction areas are commenced.

4.7.4 Management Strategies

FINAL LANDFORM AND FINAL LAND USE DESCRIPTION

The final landform of the site is to demonstrate consideration for the zoning of the land and surrounding undisturbed areas. The site has been historically used for extractive industry and is currently zoned as Rural zone under the *North Burnett Regional Planning Scheme 2014*. Council defines the purpose of the rural zone as follows:

- (a) *provide for rural uses and activities; and*
- (b) *provide for other uses and activities that are compatible with—*
 - i. *existing and future rural uses and activities; and*
 - ii. *the character and environmental features of the zone; and*
- (c) *maintain the capacity of land for rural uses and activities by protecting and managing significant natural resources and processes.*

The site rehabilitation is to return to a system that can support a rural use in line with the Planning Scheme, or where this zoning is superseded, the land use zoning at the time the EA is to be surrendered.

The landform is likely to comprise of a gently sloping, free draining platform (sloping west to east) surrounded by benches.

4.7 Rehabilitation Management Plan

Batter slopes of the pit floor are to be 3:1 (H:V) or less depending upon the geotechnical properties of the substrate. Terminal benches are to be battered to varying slopes depending upon the geotechnical properties of the substrate. Residual void batters are expected to have a face slope varying between 15° to 80°, and the final overall batter slopes will be 45° to 58°, depending on the geotechnical properties of the substrate (to be guided by a suitably qualified person).

PROGRESSIVE AND FINAL REHABILITATION METHODOLOGIES

Rehabilitation is to be undertaken progressively throughout the life of the operations and is to commence in each area as soon as practicable after it is no longer required for operational purposes. Progressive rehabilitation must take place as new areas of extraction are commenced.

Rehabilitation methodologies for the site are to generally include:

- The extraction area will be re-profiled and revegetated with pasture species.
- Battering terminal benches to stable slopes depending upon the geotechnical properties of the rock (to be informed by a suitably qualified person).
- Installing safety bunds and erosion and sediment controls.
- Covering the bench surfaces with available overburden and topsoil.
- Planting of endemic tree and shrub species on top of benches.
- Seeding of low gradient areas (slopes 0-6%) e.g., pit floor (NB. these areas are likely to be required for ongoing use until cessation of the pit development).

All areas subject to rehabilitation are to be subject to ongoing monitoring and maintenance until the vegetation is self-sustaining.

TOPSOIL AND SUBSOIL MANAGEMENT

The following measures should be implemented for topsoil and subsoil stripping:

- Materials should not be stripped when too wet or too dry.
- When stripped, materials should be used directly for rehabilitation to the maximum practicable extent or stockpiled and preserved for future use.
- Stockpiling of materials should not exceed a height of 2 to 3 m and should be shaped and revegetated to protect the soil from erosion and weed infestation.
- Stockpiles should be maintained in a free draining condition and long-term soil saturation should be avoided.
- Runoff waters external to the areas to be stripped should be diverted away from the working area.
- Stripping of topsoil should be limited to the minimum area necessary.

The following measures should be implemented for topsoil and subsoil spreading:

- Whenever possible, stripped materials should be directly placed on an area undergoing rehabilitation.
- Areas to be re-spread should be shaped prior to placing materials over the re-profiled surface.
- Equipment used to spread materials should be scheduled to avoid compaction.
- Before respreading the materials, loosen the underlying substrate to break up any compacted or surface sealing and to enable keying of the two (2) materials.

4.7 Rehabilitation Management Plan

- On slopes less than 3(H):1(V), loosen lightly compacted substrate, ensuring all ripping operations occur along the contour.
- Materials are to be removed from stockpiles in a manner that avoids vehicles travelling over the stockpiles.
- Materials are to be respread in the reverse sequence to its removal so that the original upper soil layer is returned to the surface to re-establish the entrapped seed content of the soil.
- Ensure all exposed substrates are covered with a minimum 150mm of suitable topsoil / subsoil to enable success of revegetation.
- After spreading materials, ensure the surface is left in a roughened state to assist moisture infiltration and inhibit soil erosion.
- Prior to any revegetation, cultivate any compacted or crusted topsoil surfaces (to a depth no greater than the depth of the materials to be spread).
- Spreading is to be immediately followed by revegetating wherever possible.
- If erosion occurs on treated surfaces, the area is to be re-spread with additional materials and revegetated.

SPECIES SELECTION

Table 12 – Species Suitable for Revegetation provides species that may be used for revegetation of terminal workings. This species list is indicative only, based on pre-clearing regional ecosystems mapped over the site. The species used may be any combination of these species, or more relevant alternative species as recommended by an ecologist, and should be selected at the time of revegetation based on availability at local suppliers.

Table 12 – Species Suitable for Revegetation

Final Landform Feature	Vegetation*
Terminal benches	<ul style="list-style-type: none"> • <i>Corymbia</i> • <i>C. clarksoniana</i> • <i>C. dallachiana</i> • <i>C. erythrophloia</i> • <i>C. tessellaris</i> • <i>Eucalyptus crebra</i> • <i>E. exserta</i> • <i>E. platyphylla</i> • <i>E. populnea</i> • <i>E. melanophloia</i>

4.7 Rehabilitation Management Plan

Low gradient areas (slopes 0-6%)	<p>Pasture species that may include, but are not limited to:</p> <ul style="list-style-type: none"> • Angleton grass (<i>Dicanthium aristatum</i>) • Buffel grass (<i>Cenchrus ciliaris</i>) • Butterfly pea (<i>Cenchrus ciliaris</i>) • Caatinga stylo (<i>Stylosanthes seabrana</i>) • Creeping bluegrass (<i>Bothriochla insculpta</i>) • Desmanthus (<i>Desmanthus virgatus</i>) • Digit grass (<i>Digitaria eriantha</i>) • Fine stem stylo (<i>Stylosanthes guianensis</i> var. <i>intermedia</i>) • Forest bluegrass (B. <i>bladhii</i> subsp. <i>glabra</i>) • Indian bluegrass (B. <i>Pertusa</i>) • Leucaena (<i>Leucaena leucocephala</i>) • Lotononis (<i>Lotononis bainesii</i>) • Luceme (<i>Medicago sativa</i>) • Panics (<i>P. maximum</i>) • Perennial forage sorghum, 'Silk' sorghum (<i>Sorghum</i>) • Purple pigeon grass (<i>Setaria incrassate</i>) • Rhodes grass (<i>Chloris gayana</i>) • Roundleaf cassia; Wynn cassia (<i>Chamaecrista rotundifolia</i>) • Shrubby stylo (<i>Stylosanthes scabra</i>) • Siratro (<i>Macroptilium atropurepureum</i>) • Stylo; Caribbean stylo (<i>Stylosanthes hamata</i>) • Tall finger grass (<i>Digitaria milanijana</i>)
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WEED AND PEST CONTROL

- Any materials (e.g., soil, mulch, straw) brought onto site for rehabilitation are to be inspected to ensure they are free from weeds and pests.
- Prior to the establishment of vegetation, a spraying campaign may be required to control weeds to prevent migration of weed species into areas under rehabilitation.
- Alternative methods for controlling both grass and weeds include manual weeding, burning, slashing, weed matting and mulching.
- Predation (e.g., grazing animals, birds and insects) are risks for revegetation. Depending on the situation, specific measures may be required to protect the works from predation such as fencing.

WATER BODIES

Water bodies are likely to remain within the final landform, created through the final extraction void and sediment basins utilised for stormwater management during the operational phase of the quarry.

Water bodies are to be converted to clean water storages where they are to be retained in the final landform. This can be achieved by:

- Cleaning sediment from the base of water storages.
- Battering slopes to achieve grades of no more than 3(H):1(V) where practicable.
- Ensuring that the water quality within these water storages is suitable for future use.

4.7 Rehabilitation Management Plan

GCC are to engage a suitably qualified person to assess water quality of any residual water bodies at the site to ensure that the release parameters specified by the EA conditions, or other water quality objectives agreed with the administering authority.

LAND CONTAMINATION

Prior to site closure, a contaminated land assessment by a suitably qualified person may be required. Assessment of site contamination, if required, is to be undertaken and managed in accordance with the following:

- *National Environment Protection (Assessment of Site Contamination) Measure 1999 (amended 2013)*
- *AS 4482.1-2005 - Guide to the sampling and investigation of potentially contaminated soil. Part 1 – Non-volatile and Semi-volatile compounds.*
- *AS 4482.2-2005 - Guide to the sampling and investigation of potentially contaminated soil. Part 2 – Volatile Compounds.*

Should it be identified that areas of the site have been contaminated through the operational activities, these areas are to be remediated, and validated as contaminant free, prior to site closure.

INFRASTRUCTURE

Infrastructure that is to remain on-site after the surrender of the approvals may only be retained where a landowner agreement has been provided to the administering authority which clearly itemises the infrastructure that will remain, and detail the condition it is to remain in. It is anticipated that the following infrastructure would be suitable for retention:

- Utilises and services (e.g., water, electricity, telecommunications, gas).
- Access tracks and roads.
- Water storages (rehabilitated).

Plant, equipment and buildings (including demountable and mobile infrastructure) should be removed from the final landform.

A landowner's agreement should be prepared at cessation of the rehabilitation to confirm satisfaction with the rehabilitation site and for retention of any infrastructure within the landform.

KEY PERFORMANCE INDICATORS

The Key Performance Indicators ('KPIs') summarised in **Table 13 – Key Performance Indicators for Rehabilitation** have been established to provide quantifiable measures for achieving the performance targets for rehabilitation. Progressive and final rehabilitation will be deemed complete when the KPIs are achieved.

Each of the KPIs are assigned to GCC for completion; however, should the GCC require assistance to measure the achievement of these KPIs, they are to engage a suitably qualified person.

Table 13 – Key Performance Indicators for Rehabilitation

KPI Description	Measure(s)	Critical Timeframe
The final landform demonstrates consideration for the surrounding undisturbed areas and land zoning.	True / False.	Prior to lodgement of application for surrender.
Suitable species are to be utilised for revegetation in accordance with Table 12 – Species Suitable for Revegetation .	Species as per Table 9 – Species Suitable for Revegetation.	Prior to commencement of rehabilitation activities.
Groundcover achieves a suitable density to protect surface soils from rain-induced erosion (DES 2014).	Groundcover at a minimum of 70% (DES 2014).	Assessment prior to any stormwater management device reduction or removal; and, Final assessment prior to surrender application.
Erosion rates of soil / sediment from disturbed areas associated with the extractive industry activities does not exceed natural rates experience for the locality.	Local erosion rate calculated and compared against actual site erosion rates.	Within three months of completion of each stage of the quarry (including at final stage).
Evidence that water quality of any residual water bodies complies with the water quality objectives of the EA or other agreed release parameters. Alternatively, water bodies are to be filled and stabilised with vegetation to create a clean, free-draining catchment.	Water quality objectives of EA conditions or other agreed Water Quality Objectives (e.g., Livestock Watering Guidelines).	Prior to lodgement of a surrender application for the EA.
Air quality of the final landform achieves levels consistent with adjacent undisturbed areas through establishment of the final landform.	Visual surveillance and complaints register review.	Prior to lodgement of a surrender application for the EA.
Review of geotechnical stability confirms that the site is stable and not subject to slumping.	Geotechnical assessment.	Prior to lodgement of a surrender application for the EA.
Assessment confirms the slope stability of final landforms.	Slope ratio, degree, or percentage.	Prior to lodgement of application for surrender.
Landowner statement(s) obtained for:	True / False.	Prior to lodgement of application for surrender.

KPI Description	Measure(s)	Critical Timeframe
<ul style="list-style-type: none"> any retained items of extractive industry-related infrastructure; and satisfaction with the rehabilitated final landform. 		

4.7.5 Monitoring

GCC must undertake a monitoring and maintenance period following the rehabilitation phase and action any remedial measures to ensure the rehabilitated landform transition to a self-sustaining state.

The Quarry Manager or delegate must conduct regular inspections of any rehabilitated areas to ensure maintenance and repairs are carried out as necessary. Maintenance works may include fertilising, watering, repairs to barriers, guards and plant failure replacements, refer to **Table 13 – Maintenance Schedule for Revegetation**.

The monitoring and management program will review the ongoing success of the rehabilitation treatment. The Quarry Manager or delegate may engage a consultant to assist with any detailed monitoring or management of rehabilitation. The key parameters to be measured as part of the rehabilitation monitoring and management program will include:

- Landform stability.
- Erosion and sedimentation.
- Groundcover success (<70% desirable).
- Vegetation species composition and density.
- Water quality.
- Weed presence.

Final rehabilitated areas are to be visually monitored by the Quarry Manager or delegate and, where relevant, assessed by suitably qualified persons to determine the effectiveness of measures implemented.

Table 14 – Maintenance Schedule for Revegetation

Activity	Frequency
Weed Control	
Site Preparation (where necessary)	One (1) treatment at least two (2) weeks prior to seeding / planting.
Ongoing weed management	Biannually or as required.
Revegetation	
Monitor performance and conduct any necessary maintenance.	<ul style="list-style-type: none"> One (1) month after seeding / seedling planting. Three (3) months after seeding / seedling planting. Six (6) months after seeding / seedling planting. 12 months after seeding / seedling planting. <p>OR</p>

	<ul style="list-style-type: none"> Following significant rainfall events (e.g., >25 mm).
Replace diseased or dead plants.	As necessary following maintenance inspections.
Fertilise (if applicable)	Two (2) months after topsoil spreading or seeding.
Apply mulch (if available)	One-off around tube stock plantings
Pasture management	
Slashing and fertilising	As required.

4.7.6 Contingency Plan

In the event that monitoring identifies failures in the rehabilitation implementation, the following contingency measures may be used, however; these will be adapted to the particular failure identified:

- Replacement of failed plantings to increase establishment / success rates.
- Use of fertilisers and soil ameliorants where necessary.
- Reprofilling or eroded or failed landforms.
- Application of additional topsoil where necessary to support vegetation growth.
- Impletion of additional erosion and sediment controls.
- Water quality improvements where necessary.

4.8 Bushfire Management Plan

4.8.1 Objective

The activity will be operated in a way that minimises the risk of bushfires.

4.8.2 Purpose

The site is mapped as being within areas identified as Potential Impact Buffer, Medium Potential Bushfire Intensity, High Potential Bushfire Intensity and Very High Potential Bushfire Intensity in accordance with the State Planning Policy Interactive Mapping System's Bushfire Prone Area mapping. This Bushfire Management Plan has been prepared to identify and manage potential impacts occurring as a result of bushfires.

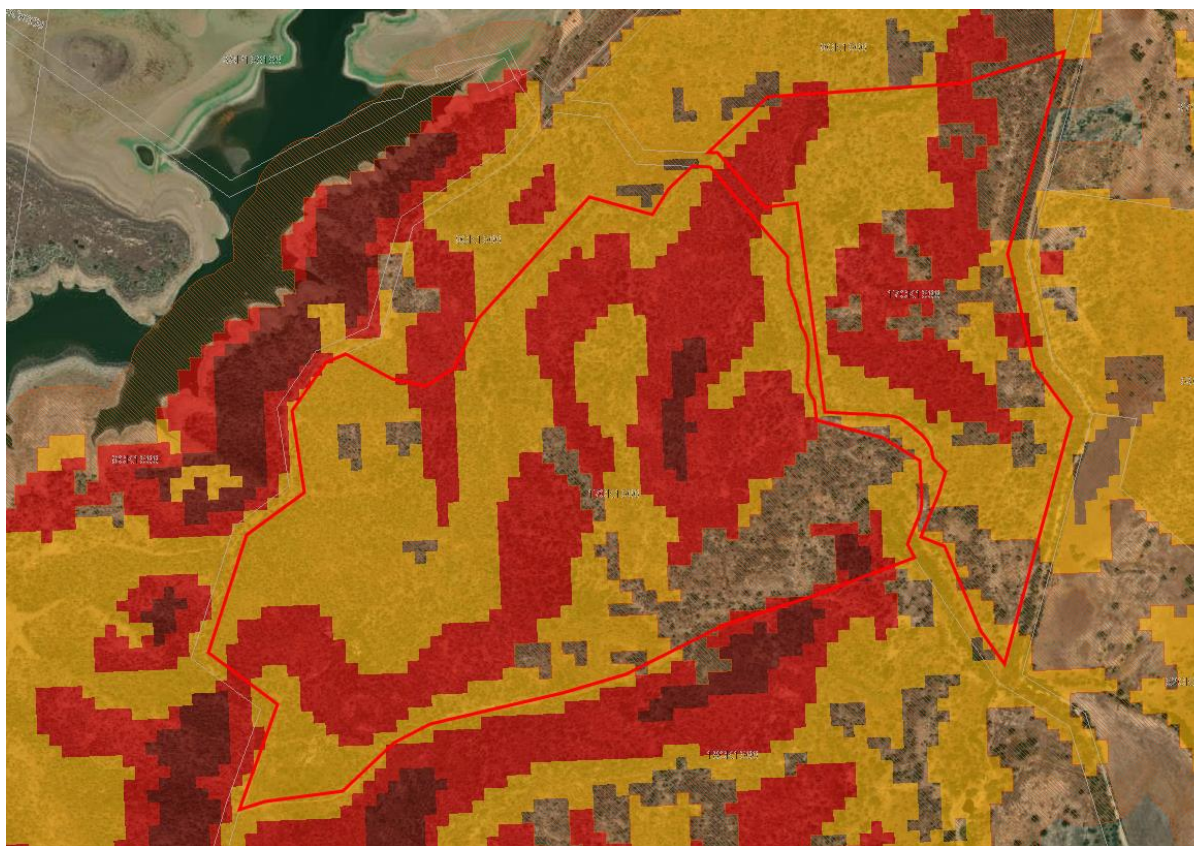


Figure 2 – Potential Bushfire Intensity

(Figure reprinted from State Planning Policy Interactive Mapping System (2023))

4.8.3 Performance Targets

- Minimise the potential for spread of bushfires on site.
- Protect people and property from bushfire impacts.
- Minimise potential impacts from bushfires on local flora and fauna.

4.8 Bushfire Management Plan

4.8.4 Management Strategies

RISK CONTROLS

- Ensure all staff on-site and other personnel are aware of evacuation procedures and the location and the use of firefighting equipment.
- Ensure there is an adequate water supply on-site in the event of a fire. Water supply sources that could be used include:
 - Pit sumps and sediment basins / water storages.
 - Water truck (when on-site).
- Keep the operational areas tidy and not storing any material around the edges of the site that would increase bushfire risk.
- Maintain a site attendance register.
- Maintain a communications system with all on-site personnel.
- Maintain firebreaks in accordance with the allowable widths prescribed under the relevant legislation (in accordance with the *Planning Regulation 2017*. The clearing is limited to the establishment and/or maintenance of necessary firebreaks to protect buildings and structures (other than fences, roads and tracks) and must be a maximum width of 20 m or 1.5 times the height of the tallest adjacent tree (whichever is the greater).
- Ensure availability of heavy earthmoving machinery and water trucks used in quarry operations to assist in the event of major bushfires, if required.
- Consult with adjacent landowners and fire services for implementing fire control management on-site in accordance with district/area fire control plans.
- Keep relevant agencies contact numbers in the event of a fire, namely the Biggenden Fire Station.

IGNITION SOURCES

- Appropriate signage is to be erected near flammable and combustible areas e.g. 'No smoking, stop engine', hazard symbols (explosive, flammable, combustible).
- Any cigarette butts must be free of embers and discarded into site bins.
- Smoking is only permitted in designated smoking areas and is not allowed in work vehicles.
- Vehicles and/or plant must be turned off during refuelling.
- Refuelling is to occur only in a designated area.
- Mobile phones must be switched off when refuelling.
- Ensure welding and other hot works is undertaken in controlled areas where potential for starting a fire is minimised.

FIRE PROTECTION

- Ensure that extinguishers, fire hoses, fire blankets, sand buckets and other such equipment is regularly inspected and maintained in accordance with *AS 1851-2005 (A4), Maintenance of Fire Protection Systems and Equipment* (Standards Australia 2005).
- All vehicles and plant must be provided with fire protection equipment (e.g., fire extinguisher, fire blanket) that meets applicable Australian Standards.
- Staff should be trained in the correct use of fire protection equipment.
- All fire extinguishers must be clearly signed and their purpose clearly visible for the user.

4.8 Bushfire Management Plan

FUEL STORAGE AREAS

- Fuel storage areas must be located away from vegetation and office areas as per *AS 1940 - The storage and handling of flammable and combustible liquids* (Standards Australia 2017a).
- Aboveground bulk tanks and package stores are to be separated from each other as per *AS 1940 - The storage and handling of flammable and combustible liquids* (Standards Australia 2017a).
- Firefighting equipment must be located within proximity to these areas.

SITE PREPARATION AND MAINTENANCE

- Plan, create and/or maintain strategic firebreaks in order to implement hazard reduction works where necessary.
- Construct and maintain perimeter fencing to prevent unauthorised access where necessary.
- Incorporate fire safety management system for chemical fires for temporary buildings and on-site vehicles.
- Consult with the local fire station and council prior to each bushfire season in order to re-assess the situation, site conditions and predicted bushfire conditions for the bushfire danger period ahead.
- Maintain a line of contact with the fire station throughout the bushfire season.

REDUCE THE HAZARD

- Assess fire risk each day and evacuate where necessary.
- Ensure no fuel load is available around work sites.
- Plan and organise for hazard reduction burns to be undertaken by the Biggenden Fire Station where necessary.
- Obtain a 'Permit to Light Fire' from the local Biggenden Fire Station as required.
- Preferable burn season is summer to winter and aim for a low to moderate intensity burn.
- Create firebreaks around all temporary facilities and infrastructure on site.

4.8.5 Monitoring

- Regularly review and update the site evacuation procedures.
 - Ensure regular surveillance of the site, to ensure access roads, fire trails and the edges of the operational area are maintained.
 - All employees will be responsible for the identification and giving alarm of fires on-site or adjacent bush fires off-site.
 - Monitor the site, conditions, and situation in order to evaluate changes occurring on or off site, e.g., changes in infrastructure, risks and hazards, legislative and environmental changes.
-

4.8.6 Contingency Plan

Should emergency fire services be required, dial '000' or '112' from a mobile.

Contact details for the local fire station (Biggenden Fire Station) and the local warden are as follows:

Biggenden Fire Station
22 George Street Biggenden 4621
Phone: 07 4140 8040

Degilbo East Fire Warden
07 4127 1564

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ATTACHMENTS

Attachment 1

Annual Environmental Performance Review

Annual Environmental Performance Review

Site:

Date:

Reviewer:

Approvals

1. Have there been any changes to the site approvals?

Note: consider the Environmental Authority, Development Permit, etc.

Yes ☐

No ☐

If yes, provide details of the change (e.g. change to Environmental Authority condition, or Development Permit condition). Include the date / reference number of the current approvals relevant to the site activities.

Environmental Monitoring

2. Has all monitoring required under the Environmental Authority been carried out?

Yes ☐

No ☐

If no, provide details

3. Has all monitoring required under the Environmental Management Plan (EMP) been carried out?

Note: Refer to Section 4. Environmental Management Plans for monitoring requirements.

Yes ☐

No ☐

If no, provide details

4. Were any exceedances of the approval limits recorded?

Yes ☐

No ☐

If yes, provide details.

5. Was the exceedance reported to the administering authority?

Yes ☐

No ☐

Provide details of any notifications to the administering authority and actions taken to address the exceedance (if any).

Complaints / Incidents

6. Have any complaints been received, or environmental incidents reported, over the previous 12 months?

Note: An environmental incident generally relates to an event which has caused, or threatens, serious or material environmental harm, consistent with the duty to notify of environmental harm under Division 2 of the *Environmental Protection Act 1994*.

Yes ☐

No ☐

If yes, briefly summarise the nature of the complaint and/or incident and any action taken to resolve the matter.

Site Operations

7. Have there been any changes to the site operations over the previous 12 months?

Yes ☐

No ☐

If yes, provide details and determine if any change to the EMP or associated management documents are required.

Proposed Measures for Improved Environmental Performance

8. Are any measures proposed to be implemented over the coming 12 months to improve the environmental performance of the site?

Note: Examples of measures may include; revised stormwater management measures, changes to fuel / chemical storage, etc.

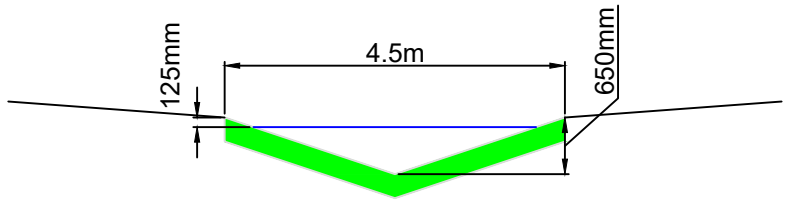
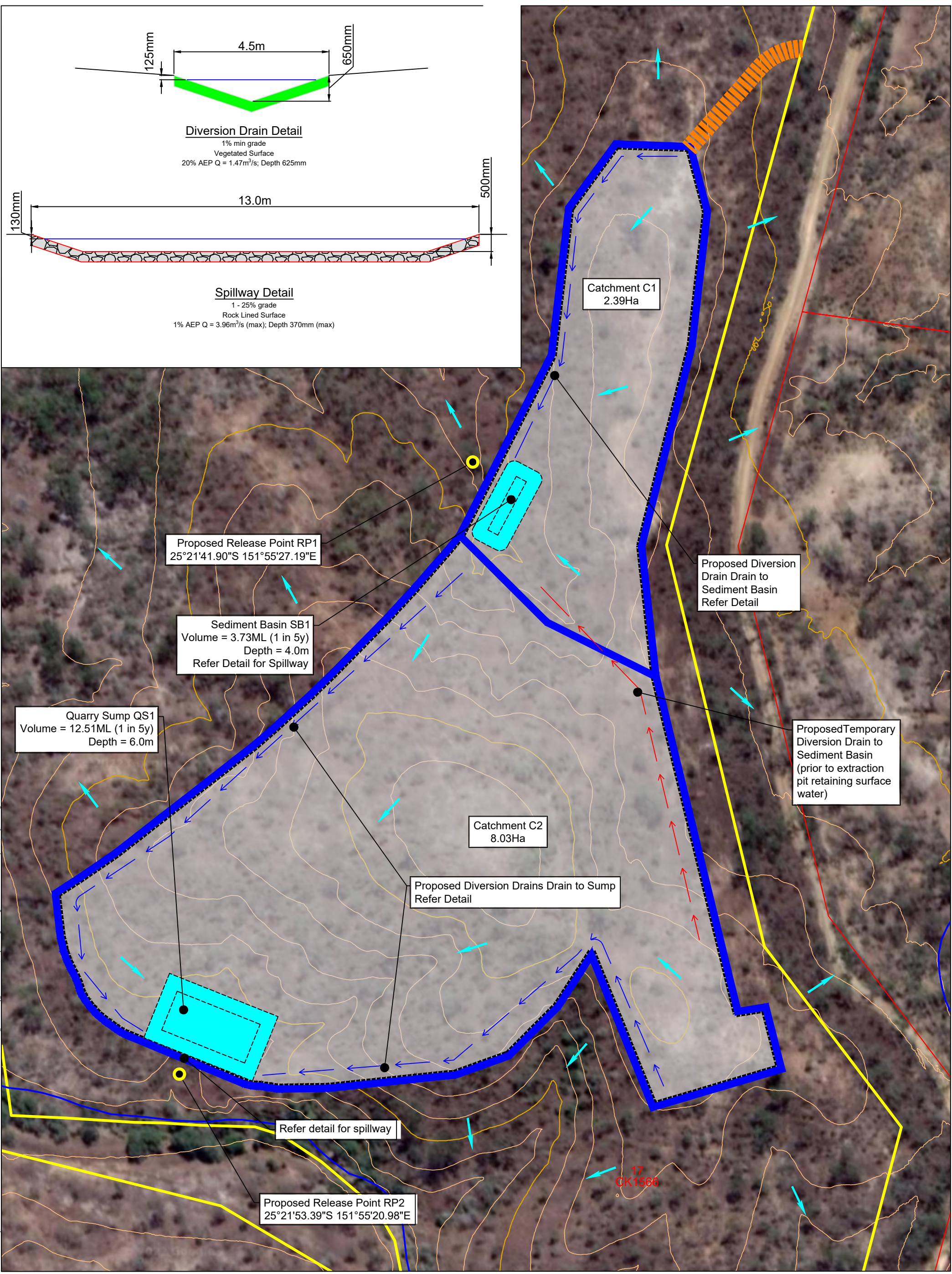
Yes ☐

No ☐

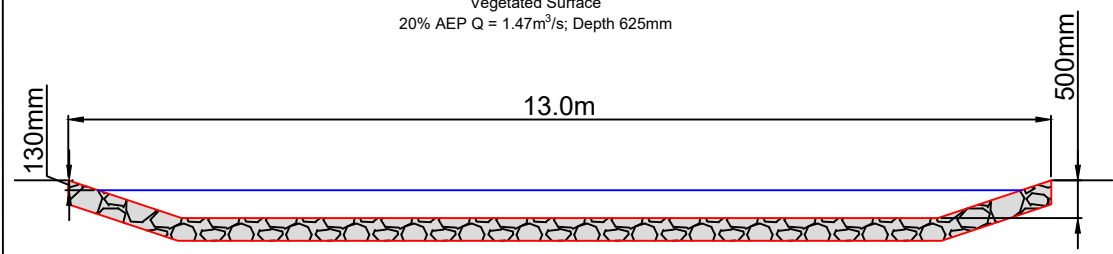
If yes, provide details and determine if any change to the EMP or associated management documents are required.

Attachment 2

Stormwater Management Plan Drawing Conceptual
Quarry Stormwater Management Plan



Diversion Drain Detail
1% min grade
Vegetated Surface
20% AEP Q = 1.47m³/s; Depth 625mm



Spillway Detail
1 - 25% grade
Rock Lined Surface
1% AEP Q = 3.96m³/s (max); Depth 370mm (max)

FILE NAME: F:\Jobs\2718\Paradise Dam Quarry Drawings\Drawings\2718.DWG 03/02/2022 Conceptual Quarry SMP.dwg
JOB SUB #:
CREATED: 24 July 2023

REV	DESCRIPTION	DATE	BY

Data Sources: Photography: Google Earth Imagery_Captured 2020-11-22 Topography: Cadastral: © The State of Queensland (Department of Resources), 2022 Ecosystem: Other:	Legend: — Site Boundary (151.05 Ha) — Cadastral Boundary — Cadastral Boundary - Watercourse	
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PROJECT: Paradise Dam Quarry	TITLE: Conceptual Quarry Stormwater Management Plan
CLIENT: Galilee Crushing & Civil Pty Ltd	GROUNDWORK plus PH: +61 7 3871 0411 WWW.GROUNDWORK.COM.AU

SCALE: 1:8000 When Printed On A3		DRAWING NUMBER: 2718.DRG.003	REVISION: 2
DATE: 24 July 2023	DRAWN: MR	DATUM: HORIZONTAL / VERTICAL / ZONE	PRINTED: 24 July 2023
CHECKED: JL	GDA2020 / MGA /	AHD /	56