

Section 6

Summary of Environmental Management and Monitoring Measures

Preamble

This section has been compiled to record the full range of environmental management and monitoring measures that would be adopted when developing and operating the Quarry. These measures are designed to effectively manage, mitigate, guide and monitor its operation of the Quarry throughout its entire operational life.

The measures are presented in tabular form (**Table 6.1**) and record the respective objectives and actions.

The actions in **Table 6.1** will be reviewed prior to the determination of the development application for the Project to remove any actions that duplicate draft conditions within the draft development consent.

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Table 6.1
Summary of Environmental Management and Monitoring Measures

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Desired Outcome	Action	Timing ¹
1. Air Quality		
Site activities are undertaken without exceeding EPA air quality criteria or goals.	1.1 Prepare and implement an Air Quality Management Plan incorporating the following. i) Details of all air quality-related design and operational safeguards. ii) An air quality monitoring program. iii) Protocols to minimise greenhouse gas emissions. iv) Protocols for incident identification and notification. v) Protocols for management of air quality-related complaints.	Prior to commencement of site establishment and construction stage
	1.2 Include appropriate training and education regarding air quality related impacts for all staff and an induction process.	During Operations
	1.3 Implement real-time particulate monitoring program.	During Operations
Reduction of dust generated by vehicles on site	1.4 Seal Quarry access road and armour trafficked area around processing plant.	Prior to commencement of product despatch
	1.5 Install wheel wash	Prior to commencement of product despatch
	1.6 Enforce speed limits on site	During Operations
	1.7 Use of water cart	During Operations
Reduction of dust generated during extraction and processing	1.8 Use of misting water sprays on mobile crushing and screeding equipment	During Operations
	1.9 Minimise exposed areas by implementing progressive vegetation clearing	During Operations
	1.10 Construction of 4m fence to limit wind erosion	Prior to commencement of processing
	1.11 Shelter stockpiles, where possible	Prior to commencement of processing
	1.12 Minimise drop height of material during truck loading and unloading	During Operations
	1.13 Management of dust generating activities during unfavourable meteorological conditions	During Operations
2. Noise and Vibration		
Reduction of noise propagation from processing operations	2.1 Locate processing plant behind 4m high fence (Stage 1), stockpiles (Stage 2)	Prior to commencement of processing in each stage
Reduction of vehicle noise (road transport vehicles)	2.2 Seal Quarry Access Road	Prior to commencement of product despatch

Table 6.1 (Cont'd)
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Desired Outcome	Action	Timing ¹
2. Noise and Vibration (Cont'd)		
Reduction of vehicle noise (internal haul vehicles)	2.3 Maintain internal roads in good condition	During operations
Operational noise remains below predicted levels	2.4 Monitoring at R16, R7 and R22	Quarterly during first year of operations – biannual thereafter
Operational noise remains below adopted criteria	2.5 Restricting noise-generating activities to nominated hours of operation	During operations
Blasting overpressure and vibration remains below predicted level	2.6 Airblast overpressure and ground vibration monitoring would be undertaken at the Quarry Entrance, R22, R23 and R8. Results would be used to inform the design of subsequent blasts	All blasts
	2.7 Prepare and implement a Noise and Vibration Management Plan.	Prior to commencement
3. Visibility and Lighting		
Reduce the impact of the Project on the visual amenity at private residences and the Pacific Highway	3.1 Minimise the extent of land disturbance / clearing in advance of quarrying.	Site establishment and construction stage and subsequent stages
	3.2 Commence progressive rehabilitation of the Site focusing particularly on the revegetation of disturbed areas where no longer required.	As soon as areas are available for rehabilitation
	3.3 Maintain a high standard of housekeeping to achieve a visually attractive site.	Ongoing
	3.4 Prepare a Lighting Management Plan for lights required for early morning product loading to minimise light spill until sunrise.	Prior to commencement of processing operations
4. Traffic and Transport		
Achieve safe and efficient road transport operations.	4.1 Prepare and implement a Driver's Code of Conduct for transport-related activities, with particular emphasis upon drivers of heavy vehicles.	Prior to despatch of any Quarry products. To be implemented throughout the entire life of the Project and reviewed annually.
	4.2 Prepare a detailed Traffic Management Plan to safely manage the traffic impacts during all stages of the Project.	3 months prior to commencement of site establishment and construction stage.
	4.3 Construct the intersection of Blue Rock Close and the Quarry access road in accordance with relevant Austroads and RMS Standards.	During site establishment and construction stage.

Table 6.1 (Cont'd)
Summary of Environmental Management and Monitoring Measures

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Desired Outcome	Action	Timing ¹
5. Terrestrial Ecology / Biodiversity		
Minimisation of long term impact on flora and fauna on and around the Site.	5.1 Prepare and implement a Landscape and Rehabilitation Plan that includes but is not limited to management of: i) Soil stripping and stockpiling. ii) Vegetation clearing protocols. iii) Clearing, handling and placement of hollow-bearing trees. iv) Weed management. v) Bush fire management. vi) Threatened species management. vii) Biodiversity offset Area(s), once secured. viii) Progressive and final rehabilitation of the Site.	Prior to commencement of site establishment and construction stage.
Secure the biodiversity offset area(s) in perpetuity for the purposes of biodiversity conservation.	5.2 Prepare a Biodiversity Offset Strategy to describe the methods through which the biodiversity offset area(s) would be secured and managed in perpetuity.	Prior to commencement of extraction operations.
	5.3 Secure in perpetuity the biodiversity offset area(s).	By the end of Year 2 of operations.
	5.4 Undertake monitoring programs annually in accordance with the approved Landscape and Rehabilitation Management Plan to review the condition of vegetation within the biodiversity offset area.	Ongoing.
Rehabilitation of the infrastructure batter and quarry benches to improve biodiversity values of the Site.	5.5 Review rehabilitation progress annually against performance indicators provided in an approved Landscape and Rehabilitation Management Plan.	Annually.
6. Surface Water		
Minimise flow reduction in Yalimbah Creek	6.1 Install diversion drains to direct clean runoff away from disturbed areas of the Site	During site establishment and construction stage and operational life of the Project
Maintain water quality in Yalimbah Creek	6.2 Install and maintain southern and western sediment basins and maximise recycling and re-use of sediment-laden runoff so as to limit likelihood of discharge.	During site establishment and construction stage and operational life of the Project
	6.3 Measure turbidity of water prior to discharging from sediment basins and flocculate water if above 50NTU.	During site establishment and construction stage and operational life of the Project
	6.4 Ensure a sump is maintained within the extraction area at all times to collect runoff from within the extraction area.	During operational life of the Project
	6.5 Conduct daily water quality monitoring during discharge from sediment basins.	During site establishment and construction stage and operational life of the Project

Table 6.1 (Cont'd)
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Desired Outcome	Action	Timing ¹
7. Groundwater		
Minimise potential impacts to local groundwater system	7.1 Deploy and maintain data loggers in monitoring bore for automated collection of groundwater levels information.	During site establishment and construction stage and operational life of the Project
	7.2 Conduct quarterly groundwater quality monitoring program for first 24 months of operations.	During site establishment and construction stage and operational life of the Project
	7.3 Annually review all groundwater monitoring data to establish local triggers (groundwater level and groundwater quality) to inform management actions.	During site establishment and construction stage and operational life of the Project
8. Aboriginal Cultural Heritage		
Provide appropriate protection to any unknown Aboriginal artefacts.	8.1 Prepare and implement an Aboriginal Cultural Heritage Management Plan to manage any potentially unknown sites of Aboriginal heritage value within the Site.	Prior to commencement of site establishment and construction stage and for the life of the Quarry.
9. Soils		
Rehabilitation using available soil resources.	9.1 Place all topsoil stripped from the infrastructure area and Stage 1A extraction area on the infrastructure embankment.	During site establishment and construction stage
	9.2 Place all topsoil stripped from Stages 1B and 1C on the batters constructed on the enlarged infrastructure area.	
	9.3 Place all topsoil stripped from Stages 2A to 2C above the overburden stockpiled within the extraction area (not greater than 2m thick).	
	9.4 Hydroseed all completed slopes with nominated seed / fertiliser mix.	Within 3 months of stockpile construction
	9.5 Install silt-stop fencing or similar immediately down-slope of stockpiles, until stable vegetation cover is established.	Immediately following stockpile construction
10. Social Impact		
Adverse impacts on members of the local community are minimised.	10.1 For the first two years of operations, host an annual community meeting at which the outcomes of environmental management and performance are presented to the community. Feedback from this meeting is to be incorporated into the Annual Review for the operation. Following the first two years of operations the frequency and agenda for this meeting will be re-evaluated with the community.	First meeting to be held at the end of the first year of operations.

Table 6.1 (Cont'd)
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Desired Outcome	Action	Timing ¹
10. Social Impact (Cont'd)		
Adverse impacts on members of the local community are minimised. (Cont'd)	10.2 Implement a complaint management procedure or protocol to ensure that any complaint received is dealt with decisively and appropriately.	Prior to site establishment and construction stage
	10.3 Continue to engage with local community members in accordance with an approved Stakeholder and Community Engagement Plan.	Ongoing
	10.4 Establish social performance criteria in an approved Stakeholder and Community Engagement Plan and report on performance against this criteria annually.	Prior to operations commencing and then annually.
	10.5 Form and support a Community Consultative Committee.	Ongoing
	10.6 Implement a blast notification protocol and pre-emptively discuss planned blasting with surrounding residents.	Prior to operational stages
	10.7 Support community organisations, groups and events as appropriate.	Ongoing
	10.8 Implement a Driver's Code of Conduct to ensure the safety of all road users and communities through which product transport trucks would pass.	Prior to establishment and construction stage
	10.9 Continue to adhere to all operating condition commitments.	Ongoing

1. Where appropriate, timing needs to be allowed for approval of the plan by DPE.

