

KARUAH EAST QUARRY MODIFICATION APPLICATION (MOD 2)

Key Environmental Aspects and Controls

Prepared for:

Karuah East Quarry Pty Ltd

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Karuah East Quarry Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
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1 Introduction

Karuah East Quarry Pty Ltd proposes to amend the existing Project Approval 09_0175 to slightly expand the area of disturbance of the Karuah East Quarry. The proposal is minor in nature and seeks to amend the Project Approval to expand the area of disturbance of the Karuah East Quarry by 1.133ha. Following detailed design and commencement of operations, it has been identified that the proposed minor extension will allow for increased operational efficiency, improved operational safety and improved environmental management, particularly relevant to surface water management. The area proposed to facilitate the MOD 2 expansion is heavily disturbed and is devoid of any significant vegetation. The area subject to MOD 2 contains a dwelling, an access road to the dwelling and a redundant electricity easement.

The Environmental Assessment *Section 75W Application (MOD 2) to amend Part 3A Project Approval 09_0175 Minor Increase to Approved Disturbance Area* (ADW Johnson August 2018) (application for MOD2) provides further detail.

SLR Consulting (SLR) has been engaged by Karuah East Quarry Pty Ltd to provide specialist inputs into key environmental aspects for the extension to the Karuah East Quarry. SLR understands that the modification is minor in nature and seeks a nominal expansion to the approved area of disturbance (31.88 hectares) by an additional 1.133ha as shown in **Figures 1 and 2**. This is an increase of less than a 3.6% in the overall approved disturbance footprint.

SLR (and GSS Environmental, who were acquired by SLR) prepared the following reports which were included in the *Environmental Assessment Report for the Proposed Karuah East Hard Rock Quarry* (ADW Johnson 2013) and *Preferred Project Report* (ADW Johnson 2013):

- Surface Water Assessment;
- Soil and Land Resource Assessment;
- Noise and Blasting Impact Assessment;
- Air Quality Impact Assessment;
- Quarry Closure and Rehabilitation Plan;
- Visual Assessment; and
- Environmental Management Strategy.

The Karuah East Quarry was approved by the NSW Planning Assessment Commission as a Part 3A Major Project on 18 June 2014 (Project Approval 09_0175). Since the time of issue of the Project Approval, prior to the commencement of construction, Karuah East Quarry Pty Ltd secured endorsement for a range of management plans from the NSW Department of Planning & Environment:

- Air Quality and Greenhouse Gas Management Plan, November 2015 (required by Schedule 3 Condition 16 of the Project Approval);
- Noise Management Plan, October 2015 (required by Schedule 3 Condition 7 of the Project Approval);
- Landscape and Rehabilitation Management Plan (required by Schedule 3 Condition 32 of the Project Approval); and
- Water Management Plan, December 2015 (required by Schedule 3 Condition 21 of the Project Approval).

These approved documents can be found on the company website at www.hunterquarries.com.au/karuah-east-documents.

Modification 1 (MOD1) to the Project Approval was granted on 27 April 2018, with this relating to a small increase in disturbance to allow for improved operational efficiencies associated with plant infrastructure within the quarry by reducing internal truck movements, and allowing for better vehicle manoeuvrability.. The approved management plans are in the process of being updated to reflect the MOD 1 approval.

In relation to the proposed modification (MOD 2), SLR inspected the proposed expansion area on 9 May 2018 and assessed the potential of the extension of Karuah East Quarry to impact on the environmental aspects addressed in the abovementioned original assessment reports. Given the minor nature of the extension, no modelling was deemed necessary. Provided that construction and operational controls for each environmental aspect are implemented, it considered there would be negligible change to current impacts at the site. An impact assessment and recommended controls are discussed in the following sections.

Other environmental aspects associated with the proposed extension of Karuah East Quarry have been assessed in the Environmental Assessment Report for the proposed modification, prepared by ADW Johnson and other consultants where necessary.

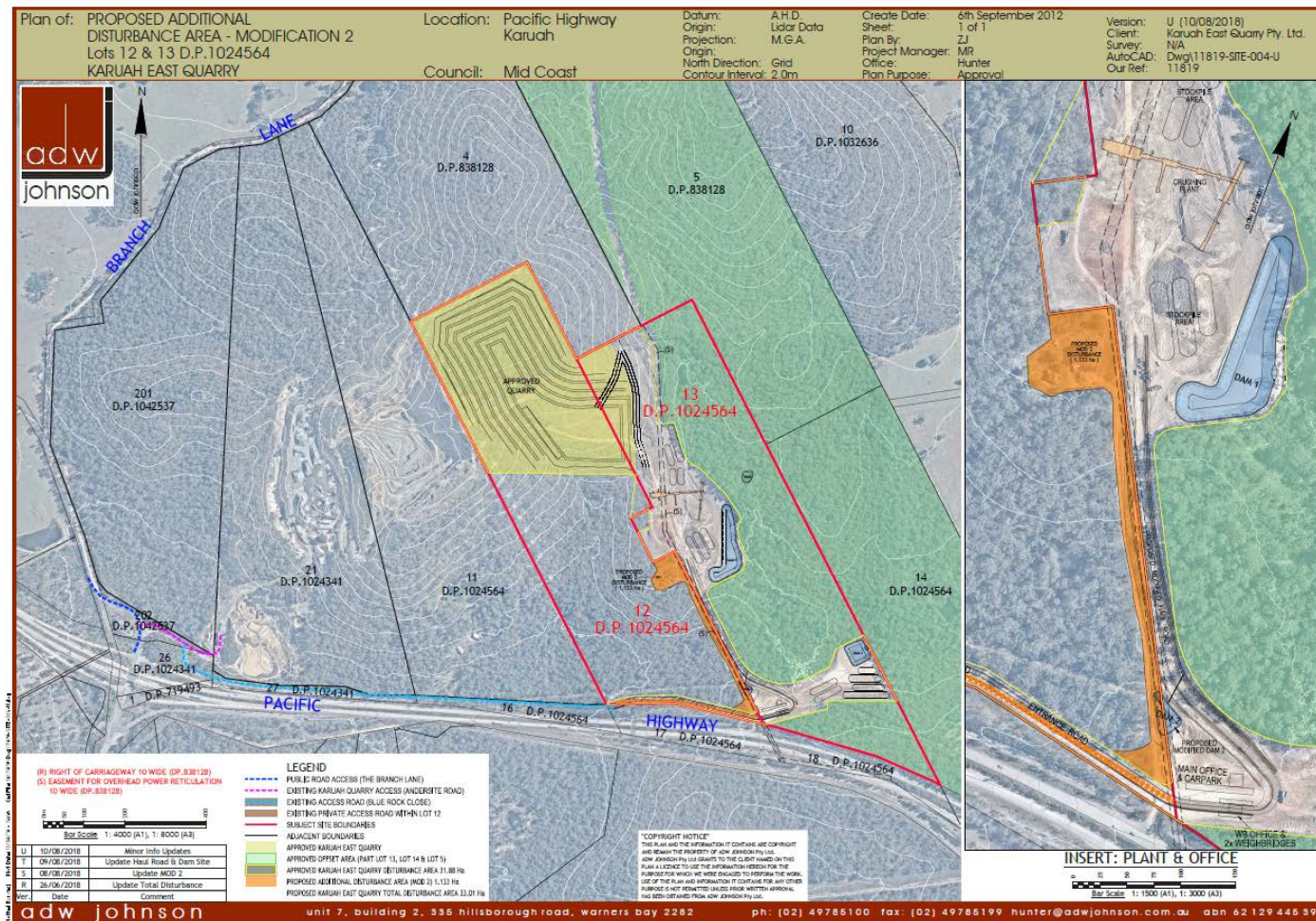


Figure 1 Proposed MOD 2 Extension Area (in orange)

2 Surface Water Management

2.1 Existing Environment

The proposed extension area was inspected by SLR on 9 May 2018. The current dirty water system was established as part of the approved Karuah East Quarry, and is detailed in the *Water Management Plan* (SLR 2015). The proposed upgrades will assist with correcting current issues relating to water management at site.

2.2 Assessment of Impacts

Construction

Noting the minor nature of the proposed additional disturbance area, SLR are of the position that there will be no increased impacts from surface water (erosion and uncontrolled discharge) provided controls are put in place during the construction phase (see **Section 2.3**). During the construction phase, it is recommended that works are completed in accordance with **Figure 2**, which provides controls for erosion and sediment controls.

There are requirements for additional water management controls within the MOD 2 extension area, including the area adjacent to the haul road.

Operational

SLR are of the position that any potential impacts to surface water from MOD2 will be effectively managed with mitigation measures in place during the operational phase (see **Section 2.3**).

2.3 Summary of Controls

For the construction phase there will be a requirement to implement temporary erosion and sediment controls as per Section 6.2.3 of the approved *Water Management Plan* (SLR 2015). This could include the use of strategically placed silt fencing, straw bales or similar. Temporary sediment controls will be constructed to intercept sediment laden runoff prior to discharge into the natural drainage system.

To achieve successful water management for the operational phase; the key erosion and sediment controls will involve changing the grade of the proposed extension area to maximise the drainage of water into the disturbed area of the site (dirty water catchment). This will involve the dumping and shaping of material within the proposed MOD 2 extension area to achieve desired water flow. Once shaping has been completed the water from the proposed MOD 2 extension area will flow to Dam 1 and Dam 2.

Conceptual arrangement of controls during construction activities is shown in **Figure 2**, and could include:

- Placement of sediment fencing at strategic locations on the western side of the haul road;
- A temporary toe drain or bund on the western side of the haul road to direct construction site disturbance towards a sump (Sediment Dam 2);
- A sump at the low point to collect runoff, which will be pumped out to the sediment dam;

- Managing bulk earthworks so that potential runoff towards the western boundary are reduced;
- Early establishment of ground cover on the external batter. This may also comprise of mulch or stone pitching utilising hard quarry stone; and
- Monitoring of water quality within Dam 2, and discharging to Yalimbah Creek when suspended solids are below 50mg/L. (This is likely to require flocculation). Alternatively dewatering to Dam 1 could be undertaken.

Sediment basins sizing calculations in accordance with Managing Urban Stormwater (Blue Book) indicate that for capture of the 5 day 90 percentile rainfall, from a catchment including 1.2ha of disturbed area and 0.3ha of clean water run-on, that a settling volume of 312m³ is required, and that the catchment will produce up to 75m³ per annum of sediment. If the sediment basin is de-silted every 24 months this would require a sediment storage volume of 150m³. The minimum required basin volume is 452m³ (312 m³ + 150 m³). Since the sediment basin (Dam 2) volume is 1526m³, it has adequate capacity.

The conceptual design detail for the external embankment includes the following key aspects:

- Batter design as per Engineering design requirements;
- A mulched or stone pitched batter, generally with larger diameter rocks towards the base; and
- Road surface graded back to the existing Dam 1 and Dam 2.

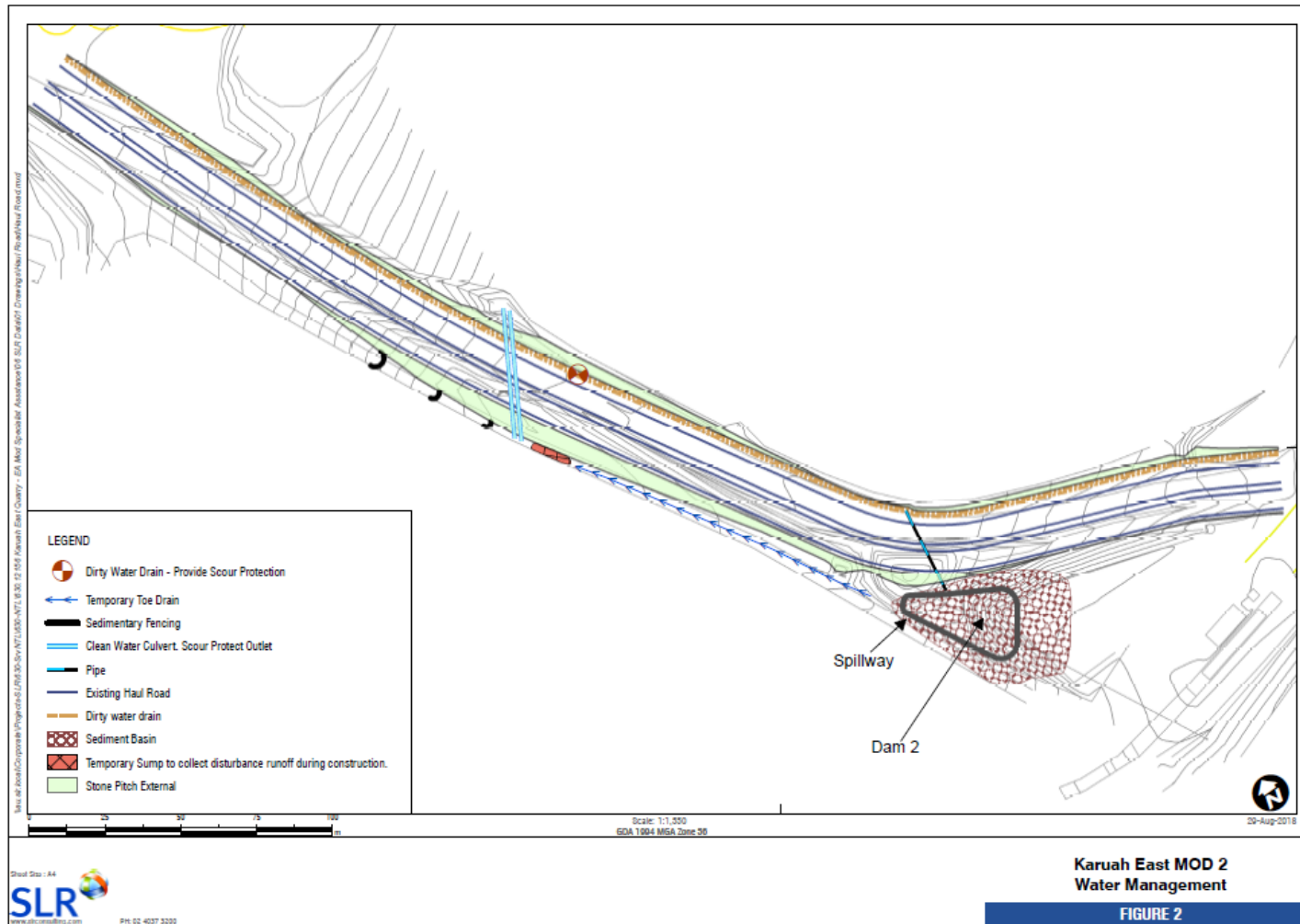
The engineering design for the proposed works may also include appropriate details for scour protection at the clean water culvert headwall and sediment dam spillway, and scour protection along steep sections of the dirty water drain alongside the road surface.

All construction activities including erosion and sediment control will be completed within the proposed disturbance footprint.

After construction, the operational phase of works included within the MOD 2 extension will include the following controls:

- Maintenance of gravel on the road surface, as cover material in trafficable areas of extension area to control erosion;
- Monitoring the condition of the external embankment to ensure there are no erosional features such as rilling or slumping, and implementation of correctional measures.
- Continuation of surface water monitoring at dams and surrounding creeks (Bulga Creek and Yalimbah Creek) as per Section 8 of the approved Water Management Plan (SLR 2015); and
- Maintenance of erosion and sediment controls.

The *Water Management Plan* (SLR 2015) will be updated following determination of the MOD 2 application to reflect the minor increase to the disturbance footprint.



3 Groundwater

Given the minor nature of the expansion, it is expected that there will be no adverse groundwater impacts. A summary of potential impacts and controls is discussed in the sections below.

3.1 Existing Environment

The groundwater conditions at the site are outlined within Section 3.1 of the approved *Water Management Plan* (SLR 2015). Karuah East Quarry Pty Ltd monitor a series of groundwater bores for groundwater quality and depth. The most recent groundwater results are outlined in the 2017 Annual Review, which is available on the Karuah East Quarry website (www.hunterquarries.com.au).

3.2 Assessment of Impacts

Construction and Operations

The *Groundwater Assessment* undertaken by Coffey Geotechnics (refer to Section 6.2.2 of the *Environmental Assessment Report* (ADW Johnson 2013) found that the typical groundwater RL at the proposed quarry site is greater than 10m below the planned quarry base. Excavation in the quarry is therefore not anticipated to intersect the groundwater surface. As such, groundwater was not included in the water balance for the Quarry as an input into the system. Since construction and operations commenced, Karuah East has not intersected the groundwater surface.

There are no predicted additional groundwater impacts associated with construction and operations for the proposed extension area. The proposed extension area is not an extension of the quarry pit and should not cause additional groundwater impacts.

3.3 Summary of Controls

Groundwater monitoring is undertaken at Karuah East Quarry as per the approved *Water Management Plan* (SLR 2015). The existing monitoring and reporting program will continue during and following the extension of the quarry disturbance area.

4 Soil and Land Resources

There will be a minor increase of approximately 1.133 hectares of disturbed land associated with the proposed MOD 2 extension area. This is less than a 3.6% increase in the overall disturbance footprint (new footprint proposed – 33.095 hectares). Given the *Soil Survey and Land Resource Assessment* (Appendix F of the Environmental Assessment Report (ADW Johnson 2013) confirmed the suitability of the project site for quarrying activities, SLR are of the position that the proposed extension area is acceptable for the purpose proposed. No additional controls or management measures are recommended.

It is also noted that much of the proposed MOD 2 extension area is already heavily disturbed (noting the existing dwelling, access to the existing dwelling and redundant electricity easement). Soil and material exposed during the clearing activities is to be stockpiled at site for use in future rehabilitation.

5 Noise Management

5.1 Existing Environment

Noise associated with Karuah East is currently associated with construction and operations. There is also cumulative noise associated with the adjacent Karuah Quarry as well as other noise sources associated with the Pacific Highway.

5.2 Assessment of Impacts

Construction

The Project Approval and Environment Protection Licence (EPL) 20611 do not provide specific construction noise criteria for the Karuah East Quarry. The NSW EPA Interim Construction Noise Guideline (ICNG) sets out noise criteria applicable to construction site noise for the purpose of defining intrusive noise impacts. ICNG Construction Noise Goals are outlined within Section 5.1 of the approved *Noise Management Plan* (SLR 2015).

Construction noise monitoring for the Karuah East Quarry was completed during 2016 and 2017. The monitoring for vegetation clearance activities was completed on 29 April 2016, with the results from this monitoring indicating that the site was compliant within the adopted construction noise goals for the site. Noise generating activities will be generated in the extension area from the clearing of vegetation as well the work associated with shaping and grading the landform. SLR predicts that the MOD 2 extension area would not cause additional construction noise impacts at the site above those already approved.

Operational

The proposed additional disturbance area will be utilised for increased operational efficiency, improved operational safety and improved environmental management, particularly relevant to surface water. The MOD 2 proposed activities will constitute a negligible change in the current operational noise level.

No blasting is proposed to be undertaken within the extension area.

5.3 Summary of Controls

Controls relating to noise are outlined within Section 6 of the *Noise Management Plan* (SLR 2015). There are no specific additional controls proposed in relation to the extension area other than those proposed in the approved *Noise Management Plan*. The *Noise Management Plan* will be updated once the MOD 2 application has been approved to reflect the increase to the disturbance footprint.

6 Air Quality Management

6.1 Existing Environment

Dust associated with Karuah East is currently associated with construction and operations. There is also cumulative air quality impacts associated with the adjacent operational Karuah Quarry.

6.2 Assessment of Impacts

Construction

The Air Quality Assessment included in Appendix F of the *Preferred Project Report (ADW Johnson 2013)* did not specifically refer to dust levels during the construction phase. Air quality monitoring has been completed during the construction phase at Karuah East, with results summarised below:

- The HVAS TSP monitoring results from 29 April 2016 until end of August 2017 have been within the Project Approval operational criteria; and
- The PM₁₀ monitoring results from 29 April 2016 until end of August 2017 have been within the annual average and 24 hour maximum criteria; and
- The depositional dust monitoring (DDG1-5) during the construction period indicate that results have been below the 4 g/m²/month criteria.

With construction being well below the criteria, and the proposed additional disturbance only equating to approximately 1.133 hectares there is predicted to be negligible additional air quality impacts associated with the proposed MOD 2 extension. It should also be noted that much of the proposed MOD2 area has already been cleared (noting the existing dwelling, access road to the existing dwelling and redundant electricity easement).

Operational

Section 8 of the Air Quality Assessment included in Appendix F of the *Preferred Project Report (ADW Johnson 2013)* stated the cumulative dust concentrations for both the existing Karuah Quarry and Karuah East Quarry will be below the Project Approval criteria for depositional dust, total suspended particulates and PM₁₀. Monitoring for PM₁₀/TSP and depositional dust. Operational dust monitoring has indicated dust levels have been within criteria.

As the extension is only minor, there are no predicted additional dust impacts at Karuah East during the operational phase. There will be no increase to the approved production limit, hence vehicle movements (and associated dust) will be within the maximum predicted as part of the original EA process.

6.3 Summary of Controls

Controls relating to air quality are outlined within Section 7 of the *Air Quality and Greenhouse Gas Management Plan* (SLR 2016). With the MOD 2 extension being a heavily trafficked area, it will be watered regularly to effectively manage air quality (dust) impacts. Gravel will be placed in the extension area to make a compact surface layer and reduce air quality impacts. The *Air Quality and Greenhouse Gas Management Plan* (SLR 2016) will be updated once the MOD 2 application has been approved to reflect the increase to the disturbance footprint.

7 Rehabilitation

The proposed extension area will be required for the life of the quarry, and no rehabilitation of this area would be completed until closure. Final rehabilitation will be undertaken in accordance with Section 9 of the *Landscape and Rehabilitation Management Plan (SLR, 2015)*.

Clearing will be undertaken in accordance with the recommendations of the Flora and Fauna Assessment (Kleinfelder 2018) which is provided as Appendix C of the *Environmental Assessment Section 75W Application (MOD 2) to amend Part 3A Project Approval 09_0175 Minor Increase to Approved Disturbance Area* (ADW Johnson August 2018) for the modification.

The *Landscape and Rehabilitation Management Plan* will be updated once the MOD 2 application has been approved to reflect the increase to the disturbance footprint.

8 Visual Amenity

From a visual perspective the proposed MOD 2 extension area cannot be seen by any sensitive receptors or from the Pacific Highway. Therefore, the proposed MOD 2 extension area will not cause any additional visual impacts for the project.

9 Environmental Management

The Environmental Management Strategy (SLR 2015) will be updated once the MOD 2 application has been approved to reflect the increase to the disturbance footprint. All procedures, including those relating to communication, complaints and dispute resolution, emergency response and non-compliance will apply to the proposed MOD 2 extension area.

10 Conclusion

There are predicted to be negligible additional impacts relating to surface water, groundwater, noise, air quality, rehabilitation and visual amenity from the proposed MOD 2 minor additional increase in disturbance area, with the implementation of the proposed controls (mitigation measures). Once the MOD 2 application is determined the specialist management plans for each of these matters, along with the *Environmental Management Strategy*, will be updated to incorporate the modified site layout and conditions of approval.

The key environmental aspect will be ongoing water management in the MOD 2 extension area, with proposed controls outlined in Section 2.

11 References

ADW Johnson (2013) *Environmental Assessment Report for the Proposed Karuah East Hard Rock Quarry*

ADW Johnson (2013) *Preferred Project Report, Proposed Karuah East Quarry*

ADW Johnson (2018) *Part 3A Project Approval 09_0175 Minor Increase to Approved Disturbance Area*

Department of Planning and Environment (MOD 1 27 April 2018) (MP 09_0175) *Karuah East Quarry Project*

Kleinfelder (2018) *Flora and Fauna Impact Assessment, Karuah East Quarry Project – Modification Application*

SLR Consulting (2015) *Environmental Management Strategy, Karuah East Quarry Project*

SLR Consulting (2015) *Landscape and Rehabilitation Management Plan, Karuah East Quarry Project*

SLR Consulting (2016) *Air Quality and Greenhouse Gas Management Plan, Karuah East Quarry Project*

SLR Consulting (2015) *Noise Management Plan, Karuah East Quarry Project*

SLR Consulting (2015) *Water Management Plan, Karuah East Quarry Project*

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