

# **ANNUAL REVIEW**

**1 January 2023 – 31 December 2023**

**Jandra Quarry**

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## APPENDICES

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Appendix 1 – Transport Summary

Appendix 2 – Annual Noise Monitoring Reports

Appendix 3 – Annual Biodiversity and Rehabilitation Monitoring Report

Appendix 4 – Independent Environmental Audit Action Plan

## SITE DETAILS

<b>Name of operation</b>	Jandra Quarry
<b>Name of operator</b>	Holcim (Australia) Pty Ltd
<b>Development consent / project approval #</b>	DA 213-10-99 (Modification 5)
<b>Name of holder of development consent / project approval</b>	Holcim (Australia) Pty Ltd
<b>Annual Review start date</b>	January 1, 2023
<b>Annual Review end date</b>	December 31, 2023
<p><b>I, David Saville, certify that this audit report is a true and accurate record of the compliance status of Jandra Quarry for the period of January 1, 2023 - December 31, 2023 and that I am authorised to make this statement on behalf of Holcim (Australia) Pty Ltd.</b></p> <p><i>Note.</i></p> <p>a) <i>_ The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i></p> <p>b) <i>_ The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</i></p>	
<b>Name of authorised reporting officer</b>	David Saville
<b>Title of authorised reporting officer</b>	Quarry Manager
<b>Signature of authorised reporting officer</b>	
<b>Date</b>	28/03/2024

# 1 STATEMENT OF COMPLIANCE

See **Table 1** for statement of commitments for the 2023 reporting period for Jandra Quarry. **Table 2** displays the DPHI compliance status key. **Table 3** details the non-compliances identified within the reporting period.

**Table 1: Statement of Commitments**

Were all conditions of the relevant approval(s) complied with?	
DA 213-10-99 (Mod 5)	No
EPL No. 2796	Yes

**Table 2: DPHI Compliance Status Key**

Risk level	Colour code	Description
<b>High</b>	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
<b>Medium</b>	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> <li>potential for serious environmental consequences, but is unlikely to occur; or</li> <li>potential for moderate environmental consequences, but is likely to occur</li> </ul>
<b>Low</b>	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> <li>potential for moderate environmental consequences, but is unlikely to occur; or</li> <li>potential for low environmental consequences, but is likely to occur</li> </ul>
<b>Admin NC</b>	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

**Table 3: Non-Compliances for 2023**

Relevant Approval	Condition	Condition description.	Compliance status	Section addressed in Annual Review/Comment																																				
DA 213-10-99 (Mod 5) EPL 2796	Schedule 3 Condition 1 L4.2	<p><b>Noise Criteria</b></p> <p>The Applicant shall ensure that the noise generated by the development does not exceed the criteria in Table 2 or Table 3 at any residence on privately-owned land.</p> <p>Table 2: Noise criteria – quarrying operations only dB(A)</p> <table border="1"> <thead> <tr> <th>Location</th> <th>6 am – 10 pm (L<sub>Aeq</sub>(15 min))</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>46</td> </tr> <tr> <td>R5</td> <td>40</td> </tr> <tr> <td>R2, R4, R6</td> <td>36</td> </tr> <tr> <td>R7</td> <td>35</td> </tr> </tbody> </table> <p>Table 3: Noise criteria – quarrying operations &amp; asphalt plant production combined dB(A)</p> <table border="1"> <thead> <tr> <th rowspan="2">Location</th> <th rowspan="2">6 am – 10 pm (L<sub>Aeq</sub>(15 min))</th> <th colspan="2">10 pm – 6 am</th> </tr> <tr> <th>(L<sub>Aeq</sub>(15 min))</th> <th>(L<sub>A1</sub>(1 min))</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>48</td> <td>46</td> <td>51</td> </tr> <tr> <td>R5</td> <td>41</td> <td>39</td> <td>51</td> </tr> <tr> <td>R4</td> <td>40</td> <td>39</td> <td>51</td> </tr> <tr> <td>R2, R6</td> <td>40</td> <td>35</td> <td>48</td> </tr> <tr> <td>R7</td> <td>36</td> <td>35</td> <td>48</td> </tr> </tbody> </table>	Location	6 am – 10 pm (L <sub>Aeq</sub> (15 min))	R1	46	R5	40	R2, R4, R6	36	R7	35	Location	6 am – 10 pm (L <sub>Aeq</sub> (15 min))	10 pm – 6 am		(L <sub>Aeq</sub> (15 min))	(L <sub>A1</sub> (1 min))	R1	48	46	51	R5	41	39	51	R4	40	39	51	R2, R6	40	35	48	R7	36	35	48	<b>Low Risk Non-Compliance</b>	<p><b>Section 6.2 Noise</b></p> <p>No monitoring was undertaken at receiver R2/EPA13 due to access restrictions with the landowner. Holcim is currently reviewing options for 2024 monitoring locations.</p>
Location	6 am – 10 pm (L <sub>Aeq</sub> (15 min))																																							
R1	46																																							
R5	40																																							
R2, R4, R6	36																																							
R7	35																																							
Location	6 am – 10 pm (L <sub>Aeq</sub> (15 min))	10 pm – 6 am																																						
		(L <sub>Aeq</sub> (15 min))	(L <sub>A1</sub> (1 min))																																					
R1	48	46	51																																					
R5	41	39	51																																					
R4	40	39	51																																					
R2, R6	40	35	48																																					
R7	36	35	48																																					
DA 213-10-99 (Mod 5)	Schedule 3 Condition 5	<p><b>Blasting Impact Assessment Criteria</b></p> <p>The Applicant shall ensure that blasting on site does not cause any exceedance of the criteria in <b>Table 4</b>.</p>	<b>Low Risk Non-Compliant</b>	<p><b>Section 6.4 Blasting</b></p> <p>A blast on 6 June exceeded the overpressure limit of 115dB. The blast was recorded to be 115.4dB</p> <p>A detailed blast report found “The air overpressure measured was due to the pressure generated by</p>																																				



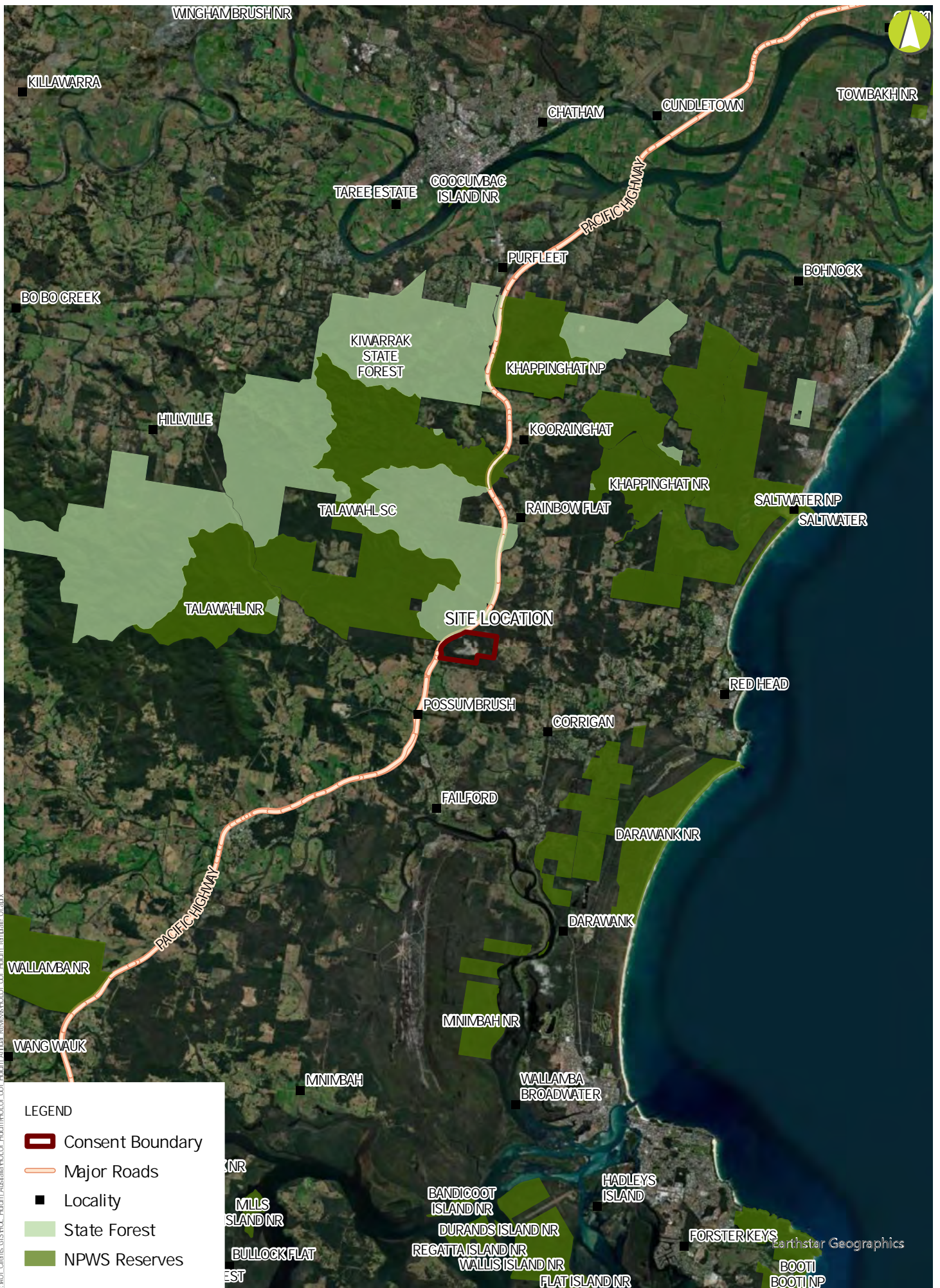
Relevant Approval	Condition	Condition description.	Compliance status	Section addressed in Annual Review/Comment												
		<p>Table 4: Blasting criteria</p> <table border="1" data-bbox="577 352 1375 539"> <thead> <tr> <th data-bbox="577 352 775 424">Location</th> <th data-bbox="775 352 972 424">Airblast overpressure (dB(Lin Peak))</th> <th data-bbox="972 352 1142 424">Ground vibration (mm/s)</th> <th data-bbox="1142 352 1375 424">Allowable exceedance</th> </tr> </thead> <tbody> <tr> <td data-bbox="577 424 775 464">Any residence on privately owned land,</td> <td data-bbox="775 424 972 464">120</td> <td data-bbox="972 424 1142 464">10</td> <td data-bbox="1142 424 1375 464">0%</td> </tr> <tr> <td data-bbox="577 464 775 539">or any public infrastructure</td> <td data-bbox="775 464 972 539">115</td> <td data-bbox="972 464 1142 539"><math>\bar{p}</math></td> <td data-bbox="1142 464 1375 539">5% of the total number of blasts over a period of 12 months</td> </tr> </tbody> </table> <p>However, these criteria do not apply if the Applicant has a written agreement with the relevant owner to exceed the limits in Table 4, and the Applicant has advised the Department in writing of the terms of this agreement.</p>	Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance	Any residence on privately owned land,	120	10	0%	or any public infrastructure	115	$\bar{p}$	5% of the total number of blasts over a period of 12 months		<p><i>multiple face holes firing in close succession due to the V initiation sequence and/or offset delay being too small."</i></p> <p>There were a total of 16 blasts in the reporting period, with this blast equating to 6.25% of the annual blasts. .</p>
Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance													
Any residence on privately owned land,	120	10	0%													
or any public infrastructure	115	$\bar{p}$	5% of the total number of blasts over a period of 12 months													

## 2 INTRODUCTION

Holcim (Australia) Pty Ltd (Holcim) operates Jandra Quarry, a hard rock quarry located on the Pacific Highway, Possum Brush, approximately 300km north of Sydney in the Mid Coast Council Local Government Area. The quarry supplies construction materials used to make concrete, roads, bridges, and asphalt across the Mid North Coast.

The previous development consent for Jandra Quarry was granted on 30 March 2000 (DA 231-10-99). Jandra Quarry sought a modification to this Development Consent under Section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to provide for an increase in production and transportation of quarry products in order to meet current and forecast market demands. The Jandra Quarry Intensification in Production Development Consent was granted on 13 March 2015 by the NSW Minister for Planning (DA 231-10-99 MOD 5).

The site also operates in accordance with Environment Protection License (EPL) No. 2796 issued by the Environmental Protection Authority (EPA). The regional locality and project approval area are outlined in **Figure 1** and **Figure 2** below.



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**LEGEND**

- Consent Boundary
- Major Roads
- Locality
- State Forest
- NPWS Reserves

Scale: 1:150,000  
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 m

GDA2020 MGA Zone 56  
 19/02/2024

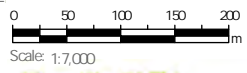


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**LEGEND**

 Consent Boundary



GDA 1994 MGA Zone 56  
8/03/2024

In accordance with Schedule 5, Condition 4 of the modified Development Consent the site is required to undertake an Annual Review of the site. This Annual Review has been prepared in accordance with Schedule 5 Condition 4 (Annual Performance Monitoring) of the Development Consent and in accordance with the *Annual Review Guideline: Post Approvals Requirements for State Significance Mining Developments* (October 2015). The Annual Review requirements and the section where they have been addressed in this document have been provided in **Table 4**.

**Table 4: Annual Review Requirement**

Condition	Section in Annual Review
<p>4. Annual Review</p> <p>Annual Review by the end of March each year, the Applicant shall review the environmental performance of the development to the satisfaction of the Secretary. This review must:</p> <p>(a) describe the development (including rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;</p>	<b>Section 4, 6 and 8</b>
<p>(b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against:</p> <ul style="list-style-type: none"> <li>- the relevant statutory requirements, limits or performance measures/criteria;</li> <li>- the monitoring results of previous years, and</li> <li>- the relevant predictions in the documents listed in condition 2 of Schedule 2;</li> </ul>	<b>Section 6 and 7</b>
<p>(c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;</p>	<b>Section 1 and 12</b>
<p>(d) identify any trends in the monitoring data over the life of the development;</p>	<b>Section 6 and 7</b>
<p>(e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and</p>	<b>Section 6</b>
<p>(f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the development</p>	<b>Section 13</b>

## 2.1 Name and Contact Details

Table 5 details the names and contact details of key Holcim staff.

Table 5: Contact Details for Jandra Quarry

Staff Member and Position	Contact Details
<b>Quarry Manager</b> David Saville	Work:(02) 6554 3169 Mob: 0429 760 983 Email: <a href="mailto:david.saville@holcim.com">david.saville@holcim.com</a>
<b>Production Supervisor</b> Peter Wilson	Work:(02) 6554 3169 Mob: 0429 790 926 Email: <a href="mailto:peter.wilson@holcim.com">peter.wilson@holcim.com</a>
<b>Environment Manager - NSW</b> Dozie Egeonu	Mob: 0429 557 493 Email: <a href="mailto:dozie.egeonu@holcim.com">dozie.egeonu@holcim.com</a>

### 3 APPROVALS

The site operates under the following approvals listed in **Table 6**.

**Table 6: Approvals for Jandra Operations**

Approval	Regulatory Authority
DA 213-10-99 (Modification No. 5)	NSW Department of Planning, Housing, and Infrastructure (DPHI)
EPL No. 2796	NSW Environmental Protection Authority (EPA)

Holcim holds EPL 2796 which covers its activities at Jandra Quarry. **Table 7** outlines the EPL licensing limits.

**Table 7: EPL Fee-Based Activity at Jandra Quarry**

Scheduled Activity	Fee Based Activity	Scale
Crushing, grinding or separating	Crushing, grinding or separating	> 100,000 – 500,000 T processed
Extractive activities	Land-based extractive activity	>100,000 – 500,000 T extracted, processed or stored
Resource recovery	Recovery of general waste	Any waste recovered
Waste storage	Waste storage – other types of waste	Any other types of waste stored

Schedule 2 Condition 8 outlines the approved extraction limit is 490,000 tonnes of quarry products from the site in any calendar year. An outline of 2023 production is outlined in **Section 4.4**.

## 4 OPERATIONS SUMMARY

### 4.1 Exploration

No exploration activities were completed during the Annual Review period.

### 4.2 Land Preparation

No land clearing occurred during the 2023 reporting period.

### 4.3 Construction Activities

There was no construction undertaken during the Annual Review period.

### 4.4 Quarry Operations

Development activities undertaken at Jandra Quarry in 2023 included:

- Stripping of topsoil and overburden within the existing extraction limit boundary;
- Drill, blast, load and haul activities; and
- Crushing, screening and stockpiling of product.

Extraction and processing operations in 2023 were undertaken between 6am and 10pm, Monday to Friday and between 6am and 6pm on Saturdays.

**Table 8** includes a summary of the operations undertaken during the reporting period against the development consent conditions regarding product transported from Jandra Quarry.

**Table 8: Total Product Distributed (Jandra Quarry)**

Material	Approved Limit	Product Distributed (T)				
		2020	2021	2022	2023	2024 (forecast)
Product Extracted Total Schedule 2, Condition 8	490 000 T	323,930	328,114	465,466	461,521	420,000
Product Sales Total Schedule 2, Condition 9	475 000 T	403,317	310,759	325,414	412,909	380,000

Schedule 2 Condition 18 states that Holcim must provide production data to DPHI and include this data in the annual review. Note that Holcim submit this data on a financial year (July-June), therefore production data will not align completely with this report. **Table 9** details the extractive data for the 2022-2023 period.



**Table 9: Extractive Data for Jandra (2022-2023 reporting period)**

Material	Material Type	Tonnes <sup>1</sup>
Construction Sand (Filling/Packing Sand)	Construction sand	4,449.9
Fill & Crusher Fines (under 5mm)	Construction sand	97,133.6
Other Unprocessed Materials	Virgin materials - Crushed coarse aggregates	109.2
Over 30mm-70mm (Railway Ballast)	Virgin materials - Crushed coarse aggregates	1,470.1
Over 5mm-30mm Concrete Aggregates	Virgin materials - Crushed coarse aggregates	166,994.7
Over 75mm (Rock broken)	Virgin materials - Crushed coarse aggregates	7,070.1
Prepared Road Base & Sub-base & Drainage Filter	Virgin materials - Crushed coarse aggregates	141,331.8
Deduct from return		31.7
	Total	419,158.1

Note 1 – Values rounded

Schedule 2 Condition 7 outlines the applicant shall not extract more than 16.5 million tonnes of quarry product under this consent. This consent was granted on 13 March 2015. From the start of 2015 to the end of 2023, the site has extracted approximately 2,252,470 tonnes which is well within the limits of the Development Consent. The cumulative production is shown in **Table 10**.

**Table 10: Cumulative Production for Development Consent**

Year	Extraction Tonnage
2015	232,028
2016	315,205
2017	335,705
2018	252,165
2019	323,930
2020	328,114
2021	325,414
2022	415, 433

Year	Extraction Tonnage
2023	461,521
<b>TOTAL</b>	2,574,082

## 4.5 Next Reporting Period

Operational activities proposed to be carried out at Jandra Quarry in 2024, include:

- Stripping of topsoil and overburden within the existing extraction limit boundary;
- Drill, blast, load and haul activities;
- Crushing, screening and stockpiling of product;
- Establishment of mobile conveyors in the stockpile area; and
- Progressive maintenance of rehabilitation.

## 5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

### 5.1 Actions from 2022 Annual Review – DPHI Review

Jandra Quarry's 2022 Annual Review was submitted by 31 March 2023. On 3 August 2023 DPHI responded with a Request for additional information (RFI) which required a revised document be submitted including the following shown in **Table 11**.

**Table 11: 2022 Annual Review comments**

DPHI Comment	Holcim Comment
<p>Update <b>Figure 2</b> and <b>Figure 3</b> to also show:</p> <ul style="list-style-type: none"> <li>• current disturbance (to the end of 2022); and</li> <li>• current rehabilitation (to the end of 2022)</li> </ul>	<p>Holcim have updated these figures</p>
<p><b>Section 6.4.3</b> reports 14 blasts occurred at the quarry in the 2022 reporting period. One blast on January 27, 2022, recorded an Airblast overpressure 119.1dB. This exceeds the blasting criteria specified in Schedule 3 condition 5 of the consent.</p> <p>Update the report to include when the exceedance was reported to the department, and what actions were taken by the site to reduce reoccurrence of an exceedance.</p> <p>Update Table 3 and Table 31 to clarify there were 14 (not 4) blasts undertaken during the 2022 reporting period.</p>	<p>Holcim have updated the tables and detailed the reporting process of this blast.</p>
<p>Update Table 29 to show:</p> <ol style="list-style-type: none"> <li>a) the correct total footprint (Total Active Disturbance + Land Being Prepared for Rehabilitation + Land Under Active Rehabilitation + Completed Rehabilitation) for 2022.</li> <li>b) The predicted Total Quarry Footprint, Total Active Disturbance and Land Under Active</li> <li>c) Rehabilitation for the 2023 reporting period, noting that Schedule 3 condition 22 of the consent requires the Applicant to rehabilitate the site progressively.</li> </ol>	<p>Holcim have updated the information in <b>Table 29</b>.</p>

This revised document was to be submitted to the Department by Thursday 31 August 2023

Holcim revised the 2022 Annual Review and submitted to the Department within the time frame specified. No response was received.

## 5.2 Actions from 2022 Annual Review – Holcim Proposed Actions

Table 12 outlines an update on the proposed Holcim actions from the previous Annual Review.

Table 12: Proposed Actions from Holcim

Improvement Measure	Activities	Works Undertaken
Progressive Rehabilitation	The site will continue to progressively rehabilitate available areas.	<p>Rehabilitation preparation and maintenance was undertaken in 2022.</p> <p>Rehabilitation planning for RL 62, 74, and 86 occurred in 2022.</p> <p>Refer to <b>Section 8</b> for more detail.</p>
Desilting of the sites main process pond/sediment Basin	The site will continue to manage sediment control structures through inspections and desilting of ponds. Tailings dams will be cleaned on an appropriate schedule.	<p>Janda Quarry undertook sediment control measures for the desilting ponds on site. Tailings dams were routinely monitored throughout the reporting period.</p> <p>Refer to <b>Section 7</b> for more detail.</p>
Biodiversity	<p>Weed spraying will continue at the site during the next reporting period. A Weed Action Plan will likely be developed to be started in 2022-2023.</p> <p>Inspection of nest boxes will be undertaken in the next reporting period.</p>	<p>Nest box monitoring was undertaken during the 2023 reporting period, as per the <i>Rehabilitation Management Plan</i>.</p> <p>Refer to <b>Section 8</b> for more detail.</p>
Continuous Monitoring System	A new continuous environmental monitoring system will be installed at the site by the end of Quarter 2 2022. This monitor will collect data on air quality and meteorological conditions.	<p>Janda Quarry installed the new continuous environmental monitoring system in July 2022. Future air quality and meteorological monitoring results will be obtained from this machine.</p> <p>Refer to <b>Section 6</b> for details</p>

## 6 ENVIRONMENTAL PERFORMANCE

### 6.1 Meteorological Monitoring

Meteorological monitoring data was collected from the Bureau of Meteorology (BOM) station 060141 at Taree Airport. The data collected was used during daily operation of the project to inform daily operations and plan future activities. Weather conditions for 2023 are summarized in **Table 13**.

**Table 13: Meteorological Monitoring Results from 2023**

Month	Total Rainfall (mm)	Minimum Temperature (°C)	Maximum Temperature (°C)
January	83.2	14	33
February	91.2	12	33
March	245.2	11	35
April	155	6	24
May	15	2	24
June	4.8	0	23
July	26.6	1	24
August	10.8	1	24
September	8.2	2	32
October	131.9	7	38
November	78.7	10	33
December	88.2	14	35
<b>Annual TOTAL</b>	938.8		

Total annual rainfall during the 2023 reporting period was 938.8mm, this is a decrease from 1970.4mm recorded in 2022, 1687.4mm in 2021 and 1450.1mm in 2020. From 2020 till 2022, the east coast of NSW experienced an active La Nina, with above rainfall data recorded during this time. The annual average recorded at BOM station 060141 (Taree) is 1148mm, with this data being recorded from 1997 onwards.

## 6.2 Noise

### 6.2.1 EIS Predictions

The noise and blasting impact assessment in the Environmental Assessment (2014) considered the potential impacts of the proposed modification on nearby sensitive residential receivers.

Noise levels (without asphalt production) below the early morning shoulder project criteria, are predicted at all private residential receiver locations and for all stages of the quarry life, provided that operations are restricted during this time including:

- No works in the approved overburden emplacement area;
- No works above RL50; and
- No operation of the mobile processing plant.

Noise levels (without asphalt production) above the day / evening criteria are predicted at three private residential receivers and range from a marginal 2 dBA to 5 dBA above the criteria. Holcim is confident that these noise levels will not be perceived as a nuisance and has negotiated agreements with the potentially affected property owners.

Predicted noise levels from the Environmental Assessment (2014) from asphalt production were up to 7 dBA above the criteria at one private residential receiver R1 during all periods and all stages of the quarry development, as this receiver has a line of sight to the asphalt plant. Holcim has a negotiated agreement with the property holder of R1.

Jandra Quarry is currently only in Stage 1 of its development plan as described in the Noise and Blasting Impact Assessment detailed within the Environmental Assessment (2014). **Table 14** details the noise modelling for this stage. All results have been below that modelled within the Environmental Assessment (2014).

**Table 14: Stage 1 Assessment without asphalt plant operating**

Receptor	Day / Evening (dBA L <sub>eq</sub> ) 7am to 10pm		Early morning shoulder (dBA L <sub>eq</sub> ) 6am to 7 am		
	Project Criteria	Predicted Level	Project Criteria	Predicted level	
		Neutral		Neutral	Worst Case
R1	41	41	40	41	46
R2	38	30	38	30	35
R3	51	<30	50	<30	30
R4	41	34	40	33	38
R5	41	40	40	38	43
R6	38	32	38	32	37

Receptor	Day / Evening (dBA L <sub>eq</sub> ) 7am to 10pm		Early morning shoulder (dBA L <sub>eq</sub> ) 6am to 7 am		
	Project Criteria	Predicted Level	Project Criteria	Predicted level	
		Neutral		Neutral	Worst Case
R7	38	<30	38	<30	<30
R8 (Holcim)	41	33	40	32	36
R9 (Holcim)	41	38	40	36	40
R10 (Holcim)	38	44	38	43	47

### 6.2.2 Approved Criteria

Criteria for each of the receivers R1 – R7, as outlined in Schedule 3, Condition 1 for both quarry operation and combined quarry and asphalt production operations are provided in **Table 15** and **Table 16**.

**Table 15: Noise Criteria – Quarrying operations only dB(A)**

Location	6am-10pm (L <sub>Aeq(15min)</sub> )
R1 <sup>1</sup>	46
R5	40
R2, R4, R6	36
R7	35

**Table 16: Noise Criteria – Quarrying activities & asphalt plant production combined dB(A)**

Location	6am-10pm (L <sub>Aeq(15min)</sub> )	10pm – 6am	
		(L <sub>Aeq(15min)</sub> )	(L <sub>Aeq(1min)</sub> )
R1 <sup>1</sup>	48	46	51
R5	41	39	51
R4	40	39	51
R2, R6	40	35	48
R7	36	35	48

*Note 1 – Holcim have a negotiated agreement with the property owner of R1 which excludes this receptor from the approved noise criteria.*

### 6.2.3 Key Environmental Performance

Attended annual noise monitoring was undertaken by Ramboll Australia Pty Ltd (Ramboll) on 17 and 18 May 2023.

Jandra Quarry received a Notice of Variation for EPL 2796 from the EPA on 27 August 2021, which varied the required noise monitoring frequency. The noise monitoring frequency was changed from a quarterly basis to annual on the issue of this Notice of Variation. This variation was based on zero noise complaints being received by the project since 2016 and the compliant results of previous noise monitoring results.

Noise monitoring occurred at the locations R4, R5, R6, and R7 in the 2023 report period. Noise monitoring was not completed at R2/EPA13 in 2023 as access approval was not able to be obtained from the resident. The results shown in **Table 17** include the noise monitoring results for the Morning Shoulder and Day periods and note the project does not operate during Evening or Night hours defined by the EPL.

**Table 17: Annual Noise Monitoring Results 2023**

Assessment Period	Receiver No.	EPA ID	Quarrying Noise Criteria	Annual Results
			L <sub>Aeq</sub> (15min)	
Morning Shoulder	R2	EPA13	36	NA
	R4	EPA14	36	<34
	R5	EPA15	40	<36
	R6	EPA16	36	<31
	R7	EPA17	35	<28
Day	R2	EPA13	36	NA
	R4	EPA14	36	<36
	R5	EPA15	40	<36
	R6	EPA16	36	<29
	R7	EPA17	35	<28
Evening	R2	EPA13	36	Quarry Not Operating
	R4	EPA14	36	Quarry Not Operating
	R5	EPA15	40	Quarry Not Operating
	R6	EPA16	36	Quarry Not Operating



Assessment Period	Receiver No.	EPA ID	Quarrying Noise Criteria	Annual Results
			LAeq <sub>(15min)</sub>	
	R7	EPA17	35	Quarry Not Operating

As Holcim was unable to undertake annual monitoring at receiver R2/EPL13 due to access agreements with the property owner, this is a low non-compliance for Schedule 3, Condition 1 and EPL Condition L4.2 (Noise Limits). Holcim is currently reviewing alternate locations for noise monitoring and will liaise with EPA about removing or amending the R2/EPL13 location. Holcim notified the Department and EPA of this missed monitoring event.

The assessments identified that noise emissions generated by Jandra Quarry were generally compliant with relevant statutory noise criteria specified in EPL and Consent. Non-quarry or extraneous sources of noise included distant traffic, wind, and fauna such as birds and insects. During all monitoring times, Jandra Quarry was recorded as being inaudible.

**Long-term Trends:**

2023 noise monitoring results were consistent with previous noise monitoring results. All available noise results in 2023 were compliant.

There were no noise complaints received during 2023.

**Comparison to EIS Predictions:**

2023 noise results at Jandra Quarry generally remained consistent with EIS predictions.

The well-established vegetative buffer and distance between the operations and the sensitive receivers assists the Quarry in meeting these predictions.

**6.2.4 Management Measures**

Management measures relating to noise are outlined within the *Jandra Quarry Noise and Blast Management Plan*. These include:

- Defined operating hours as per Schedule 2 Condition 10 of the Development Consent;
- Work restrictions during the early morning shoulder period;
- Monitoring for noise and meteorological conditions;
- Broadband reversing beepers;
- Staff and contractors inductions; and
- Controlled blasting activities.

**6.2.5 Proposed Improvements**

Jandra will continue to implement and document corrective actions when exceedances or incidents are detected. Jandra will liaise with EPA about removing or amending Noise Monitoring location R2 due to

access issues.

## 6.3 Air Quality

An aerosol particle monitor (Dust Sentry Pro) was installed in April 2022 in accordance with Condition M2.2 of EPL 2796.

PM<sub>10</sub> will be continuously monitored, and results will be available immediately through the online system and will be analysed with consideration of the criteria. Continuous PM<sub>10</sub> data will be used as a real time management tool linked with the Contingency Plan to ensure appropriate air quality controls are being implemented to keep PM<sub>10</sub> levels within criteria. Real time PM<sub>10</sub> monitoring will be used as an additional management tool to the proactive management controls.

### 6.3.1 Environmental Assessment Predictions

Jandra Quarry is currently in Stage 1 of its development plan as described in the Air Quality Impact Assessment detailed within the Environmental Assessment (2014). **Table 18** displays the modelled dust contributions expected from Jandra Quarry. The air quality impact assessment concluded that with the implementation of existing and additional feasible management measures, all relevant air quality criteria could be met at all identified sensitive residential receivers for all stages of the quarry development.

**Table 18: Predicted Incremental & Cumulative Annual Average TSP Concentrations (µg/m<sup>3</sup>)**

Receptor ID	Increment			Cumulative		
	Stage 1	Stage 2	Stage 3	Stage 1	Stage 2	Stage 3
<b>Privately Owned Receptors</b>						
<b>R1</b>	2.5	2.6	2.8	48.5	48.6	48.8
<b>R2</b>	0.3	0.3	0.4	46.3	46.3	46.4
<b>R3</b>	0.8	0.7	0.6	46.8	46.7	46.6
<b>R4</b>	0.9	0.8	0.7	46.9	46.8	46.7
<b>R5</b>	0.6	0.5	0.5	46.6	46.5	46.5
<b>R6</b>	0.4	0.4	0.5	46.4	46.4	46.5
<b>R7</b>	0.1	0.1	0.2	46.1	46.1	46.2
<b>R11</b>	0.4	0.4	0.3	46.4	46.4	46.3
<b>R12</b>	0.3	0.3	0.3	46.3	46.3	46.3
<b>R13</b>	0.3	0.3	0.3	46.3	46.3	46.3
<b>R14</b>	0.3	0.3	0.3	46.3	46.3	46.3
<b>R15</b>	0.2	0.2	0.2	46.2	46.2	46.2

Receptor ID	Increment			Cumulative		
	Stage 1	Stage 2	Stage 3	Stage 1	Stage 2	Stage 3
R16	0.3	0.2	0.2	46.3	46.2	46.2
R17	<0.1	<0.1	0.1	<46.1	<46.1	46.1
R18	<0.1	<0.1	<0.1	<46.1	<46.1	<46.1
R19	0.4	0.4	0.5	46.4	46.4	46.5
<b>Quarry Owned Receptors</b>						
R8	1.3	1.1	1	47.3	47.1	47
R9	1.7	1.7	1.7	47.7	47.7	47.7
R10	1.5	1.5	4.6	47.5	47.5	50.6
<b>Criteria</b>					<b>90</b>	

### 6.3.2 Approved Criteria

Air Quality monitoring is required to be undertaken in accordance with the following criteria in Schedule 3 Condition 10 of the Development Consent represented in **Table 19** and **Table 20**.

**Table 19: Long-term impact assessment criteria for particulate matter**

Pollutant	Averaging Period	<sup>d</sup> Criterion
Total suspended particulate (TSP) matter	Annual	<sup>a</sup> 90 µg/m <sup>3</sup>
Particulate matter <10 µm (PM <sub>10</sub> )	Annual	<sup>a</sup> 30 µg/m <sup>3</sup>

<sup>a</sup> Total impact (ie incremental increase in concentrations due to the development plus background concentrations due to all other sources);

<sup>b</sup> Incremental impact (ie incremental increase in concentration due to the development on its own);

<sup>c</sup> Deposited dust is to be assessed as insoluble solids as defined by Standards Australia AS/NZS 3850:10.1.2003 – Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method

<sup>d</sup> Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Secretary in consultation with EPA.

**Table 20: Short-term impact assessment criteria for particulate matter**

Pollutant	Averaging Period	<sup>d</sup> Criterion
Particulate matter <10 µm (PM <sub>10</sub> )	24 hour	<sup>a</sup> 50 µg/m <sup>3</sup>

<sup>a</sup> Total impact (ie incremental increase in concentrations due to the development plus background concentrations due to all other sources);

<sup>b</sup> Incremental impact (ie incremental increase in concentration due to the development on its own);

<sup>c</sup> Deposited dust is to be assessed as insoluble solids as defined by Standards Australia AS/NZS 3850:10.1.2003 – Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method

<sup>d</sup> Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Secretary in consultation with EPA.

### 6.3.3 Key Environmental Performance

#### 6.3.3.1 PM<sub>10</sub> Monitoring

PM<sub>10</sub> monitoring is required to be undertaken in accordance with the criteria provided in **Table 19** and **Table 20**.

Monitoring for PM<sub>10</sub> first commenced in May 2017 and has continued into the 2023 reporting period. Results are provided in **Table 21**. Throughout the 2023 reporting period, all samples were compliant against performance criteria this report period. There were no exceedances in the short-term criteria value of 50 µg/m<sup>3</sup>.

**Table 21: PM<sub>10</sub> and TSP Monitoring – 2023**

Sampling Date	PM <sub>10</sub> (µg/m <sup>3</sup> )	TSP (µg/m <sup>3</sup> )	Compliance Status
5/01/2023	4.25	7.06	Within Criteria
11/01/2023	2.91	4.83	Within Criteria
17/01/2023	3.29	5.46	Within Criteria
23/01/2023	5.90	9.79	Within Criteria
29/01/2023	2.64	4.38	Within Criteria
4/02/2023	0.32	0.53	Within Criteria
10/02/2023	0.07	0.12	Within Criteria
16/02/2023	0.29	0.48	Within Criteria
22/02/2023	9.22	15.31	Within Criteria
28/02/2023	14.92	24.77	Within Criteria
6/03/2023	10.27	17.05	Within Criteria
12/03/2023	14.26	23.67	Within Criteria
18/03/2023	15.93	26.44	Within Criteria
24/03/2023	14.86	24.67	Within Criteria
30/03/2023	14.29	23.72	Within Criteria
4/04/2023	8.89	14.76	Within Criteria

Sampling Date	PM <sub>10</sub> (µg/m <sup>3</sup> )	TSP (µg/m <sup>3</sup> )	Compliance Status
10/04/2023	7.00	11.62	Within Criteria
16/04/2023	7.37	12.23	Within Criteria
22/04/2023	6.82	11.32	Within Criteria
28/04/2023	9.24	15.34	Within Criteria
4/05/2023	9.16	15.21	Within Criteria
10/05/2023	6.98	11.59	Within Criteria
16/05/2023	6.79	11.27	Within Criteria
22/05/2023	8.97	14.89	Within Criteria
28/05/2023	5.83	9.68	Within Criteria
3/06/2023	9.80	16.27	Within Criteria
9/06/2023	3.61	5.99	Within Criteria
15/06/2023	8.14	13.51	Within Criteria
21/06/2023	6.22	10.33	Within Criteria
27/06/2023	7.89	13.10	Within Criteria
3/07/2023	5.30	8.80	Within Criteria
9/07/2023	6.92	11.49	Within Criteria
15/07/2023	8.47	14.06	Within Criteria
21/07/2023	6.20	10.29	Within Criteria
27/07/2023	6.13	10.18	Within Criteria
2/08/2023	6.89	11.44	Within Criteria
8/08/2023	5.44	9.03	Within Criteria
14/08/2023	2.24	3.72	Within Criteria
20/08/2023	12.96	21.51	Within Criteria
26/08/2023	7.98	13.25	Within Criteria
1/09/2023	6.46	10.72	Within Criteria

Sampling Date	PM <sub>10</sub> (µg/m <sup>3</sup> )	TSP (µg/m <sup>3</sup> )	Compliance Status
7/09/2023	10.80	17.93	Within Criteria
13/09/2023	5.85	9.71	Within Criteria
19/09/2023	17.82	29.58	Within Criteria
25/09/2023	6.66	11.06	Within Criteria
2/10/2023	26.50	43.99	Within Criteria
8/10/2023	4.25	7.06	Within Criteria
14/10/2023	7.41	12.30	Within Criteria
20/10/2023	9.67	16.05	Within Criteria
26/10/2023	8.06	13.38	Within Criteria
1/11/2023	14.43	23.95	Within Criteria
7/11/2023	5.75	9.55	Within Criteria
13/11/2023	16.95	28.14	Within Criteria
19/11/2023	7.45	12.37	Within Criteria
25/11/2023	5.47	9.08	Within Criteria
1/12/2023	4.98	8.27	Within Criteria
7/12/2023	16.48	27.36	Within Criteria
13/12/2023	8.47	14.06	Within Criteria
19/12/2023	11.75	19.51	Within Criteria
25/12/2023	10.77	17.88	Within Criteria
31/12/2023	12.13	20.14	Within Criteria
<b>Annual Average</b>	<b>8.41</b>	<b>13.95</b>	<b>Within Annual Average Criteria</b>

**Table 22** compares annual average PM<sub>10</sub> and TSP results for the last 5 years, which were all within the impact assessment criteria. There has been a continued decrease in PM<sub>10</sub> averages since 2019.

**Table 22: PM<sub>10</sub> Monitoring Trends**

Monitoring Summary for Annual Review Period	2019 (µg/m <sup>3</sup> )	2020 (µg/m <sup>3</sup> )	2021 (µg/m <sup>3</sup> )	2022 (µg/m <sup>3</sup> )	2023 (µg/m <sup>3</sup> )
PM <sub>10</sub> Average	20	17.3	14.4	12.04	8.41
Max. PM <sub>10</sub>	94	102.0	39.3	26.4	26.50
Min. PM <sub>10</sub>	0.1	5.9	2.9	3.27	0.07

**Long-term Trends:**

The annual average particulate matter levels from 2019 to 2023 have been consistently below the target criteria. The 2023 period had the lowest minimum and lowest maximum PM<sub>10</sub> since monitoring commenced.

**Comparison to EIS Predictions:**

The results for depositional dust and PM<sub>10</sub> were within the predicted limits of the EIS predictions.

**6.3.3.2 Total Suspended Particulate (TSP) Matter Results**

Jandra Quarry has installed a Dust Sentry Pro air quality monitor, with TSP being calculated based on PM<sub>10</sub> results. TSP levels against the criteria outlined in **Table 19**. TSP results for 2023 are displayed in **Table 21**. The 2023 calculated average for TSP was 13.95 µg/m<sup>3</sup> which is less than the criteria value of 90 µg/m<sup>3</sup>. The 2023 TSP average is less than previous years.

**6.3.4 Management Measures**

Dust minimisation and control measures implemented on site include:

- The use of a watercart that follows specified procedures to achieve the most optimal dust control measures;
- The use of installed sprinkler systems along primary haul road;
- Sprays throughout the plant;
- Speed limits across the site;
- Dust covers in place across the screening building;
- Daily inspections;
- Monitoring for air quality and meteorological conditions; and
- Training of staff and contractors.

**6.3.5 Proposed Improvements**

The Jandra Quarry *Air Quality Management Plan* was progressively revised during 2020 to incorporate improvement actions from the 2019 IEA. *The Air Quality Management Plan* was submitted to DPHI and approved in 2021.



## 6.4 Blasting

### 6.4.1 Environmental Assessment Predictions

The Noise and Blasting Impact Assessment (SLR, 2014) identified the Maximum Instantaneous Charge (MIC) for the ANZECC Guidelines for human comfort to be met, at the closest private (non-Holcim owned) residences, during all stages of the quarry development.

The design of blasts will then be optimized to limit the possibility of EPA criteria exceedances, when blast locations are closer to residences and preferred blast designs can be used for blast locations with adequate distances to residences.

### 6.4.2 Approved Criteria

The site undertook blasts in 2023 in accordance with the criteria listed in **Table 23**. This criterion is taken from the blasting criteria in *Table 4* of Schedule 3 Condition 5 of the Development Consent.

**Table 23: Blasting Criteria for Jandra Quarry**

Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance
Any residence on privately owned land, or any public infrastructure	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months

### 6.4.3 Key Environmental Performance

Results of blasting undertaken in 2023 are shown in **Table 24**.

**Table 24: Blast Monitoring Results for Jandra Quarry**

Blast Number	Date	Result	
		Vibration (mm/s)	Overpressure (dBL)
1	17/01/2023	0.81	85.4
2	24/01/2023	0.25	97.4
3	3/03/2023	1	85.4
4	30/03/2023	1.7	103
5 <sup>1</sup>	18/04/2023	0.49	103.4
6	28/04/2023	<b>6.1<sup>2</sup></b>	100.2

Blast Number	Date	Result	
		Vibration (mm/s)	Overpressure (dBL)
7	6/06/2023	0.67	<b>115.4</b>
9	21/06/2023	0.84	105.3
8	19/07/2023	1.16	111.5
10	28/07/2023	DNT	DNT
11	7/08/2023	0.19	110.4
12	12/09/2023	0.18	110.2
13	18/09/2023	0.2	108.1
14	4/10/2023	DNT	DNT
15	15/12/2023	1.65	107.1
16	19/12/2023	DNT	DNT

DNT – Did Not Trigger

Note 1 – 18 April blasts were conducted simultaneously at 3:09pm. This is classed as one blast.

Note 2 – 28 April blast recorded ground vibration of 6.1mm/s. In a detailed report, it was concluded this blast was complaint. This result will be excluded from maximum values.

On 28 April 2023, a blast recorded a higher than expected vibration result of 6.1mm/s. In a detailed vibration report dated 02 May 2023, Orica concluded this to have resulted from the use of soil spikes and poor soil conditions. At commencement of planning the blast, requests were made to the owners of the property (R2) to install a small concrete plinth to allow blast monitors to be placed in accordance with *Australian standards 2187.2*. The request was refused, and instead a monitor geophone was installed using soil spikes. At the time of monitor installation, the soil condition was identified by the operator as soft and saturated, and *AS2187.2* recommends soil spikes are not to be used in soft conditions as they may lead to exaggerated results. It is likely that vibration levels for this blast were below the 5mm/s limit.

This blast was self-reported to the EPA and DPHI. Staff and contractors have been advised to follow the Drill and Blast procedure detailed in the *Noise and Blast Management Plan*.

On 10 May 2023 Holcim provided an additional *Blast Exceedance Result Report* to the Department as per Schedule 5 Condition 6 of the development consent. The finding of this report determined that the use of soil spikes likely lead to unreliable results. In addition, the landholder had advised they no longer wish for monitoring to occur on their property in any form. Holcim is now working to relocate the monitoring point and identify a suitable replacement location where a concrete plinth can be installed. This will require further discussion with neighbouring landholders and the monitoring contractor. This will subsequently require a variation application to EPL 2796, and an amendment to the Noise and Blast Management Plan to be approved by DPE.

Holcim does not believe a blast exceedance occurred, and that the limits of the EPL and Noise and Blast Management Plan have not been exceeded.

On 6 June 2023, a blast recorded an air overpressure reading of 115.4dBL. As this exceeds the

allowable 5% of the annual blasts (6.25%) this is a non-compliance. This non-compliance was noted in an Overpressure Investigation Report (Orica 2023) which concluded that the result was due to the pressure generated by multiple face holes firing in close succession due to the V initiation sequence and/or offset delay being too small. A review of the blast video showed no signs of uncontrolled explosive energy, and the blast face was partly buffered by previous blast material.

Staff and contractors have been advised to follow the Drill and Blast procedure detailed in the *Noise and Blast Management Plan*.

There was a total of 16 blasts recorded in 2023, with one(6.25%) above the 5% allowable above exceedance criteria, this was found to be a low non-compliance for Schedule 3, Condition 5.

Sensitive receivers near the quarry are notified prior to blasting as per the *Jandra Quarry Noise and Blast Management Plan*. This process is managed by the weighbridge staff who send a text message to the tenants the day before a blast is planned.

#### Long-term Trends:

Blast data from 2015 till 2023 is displayed in **Table 25**.

**Table 25: Long Term Blasting Trends**

Year	Number of Blasts	Max. Overpressure (dBL)	Average Overpressure (dBL)	Max Vibration (mm/s)	Average Vibration (mm/s)
2015	10	114.9	109.8	2.48	1.58
2016	9	116	107.8	1.3	0.84
2017	16	113.2	105.7	3.1	1.02
2018	11	111.0	99.8	1.52	0.85
2019	10	109.9	86.2	4.3	1.3
2020	11	111.9	104.5	2.4	1.5
2021	13	109.1	105.7	1.4	0.7
2022	14	119.1	102.21	2.4	0.91
2023	16	115.4	103.3	1.65*	1.15

*Note – Blast on 28 April 2023 has been excluded from long term trends.*

#### Comparison to EIS Predictions:

The results for blasting were within the predicted limits of the EIS predictions.

#### 6.4.4 Management Measures

Management measures relating to blasting are outlined within the *Jandra Quarry Noise and Blast Management Plan*, which includes a Drill and Blast Procedure. This procedure outlines the key steps of the blasting process including design, drilling, loading, and firing.

#### **6.4.5 Proposed Improvement**

The Jandra Quarry *Noise and Blast Management Plan* (NBMP) is currently being amended to move the blast monitoring location. No proposed improvements.

## 6.5 Traffic Management

### 6.5.1 Environmental Assessment Predictions

Section 3.5.6 of the Environmental Assessment (2014) stated that at peak demand, the maximum number of heavy vehicles leaving the site to deliver product to customers would reach approximately 12 (24 truck movements) per hour. This has been calculated based on a minimum loading time of approximately 5 minutes per truck. It is unlikely that, on a typical day, these peaks in demand will occur for more than a few hours at a time. A detailed assessment of traffic and transport is outlined within Section 6.2 of the Environmental Assessment (2014).

### 6.5.2 Approved Criteria

The site is required to operate traffic and manage transport through compliance with the requirements of the conditions listed below:

<p><b>Pacific Highway Intersection</b></p> <p>31. The Applicant shall maintain the intersection of the Pacific Highway and the Jandra Quarry Access Road, for the duration of product transport from the site, to the satisfaction of the RMS.</p> <p>32. The Applicant shall install and subsequently maintain street lighting at the intersection of the Pacific Highway and the Jandra Quarry Access Road, to the satisfaction of the RMS, prior to transporting quarry products from the site outside of the hours 7 am to 6 pm. Any works affecting the Pacific Highway must not take place without the prior approval of the RMS.</p> <p><b>Monitoring of Product Transport</b></p> <p>33. The Applicant shall keep accurate records of:</p> <ul style="list-style-type: none"><li>(a) the amount of quarry products, including asphalt, transported from the site (calendar month and year);</li><li>(b) the number of laden vehicle movements to and from the site (day, calendar month and year); and</li><li>(c) publish these records on its website at the end of each calendar quarter.</li></ul>
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### 6.5.3 Key Environmental Performance

The site has maintained the intersection at the Pacific Highway and Quarry Access Road in accordance with the conditions in **Section 6.4.2**. No impacts to the intersection have been identified during the reporting period.

The site does not operate outside the hours of 7am and 6pm.

All truck movements and quarry product volumes are published on the Holcim (Jandra Quarry) webpage in accordance with Schedule 3, Condition 33 of the consent. A summary of transport data for 2023 is appended to this Annual Review as **Appendix 1**.

In summary:

- There were 14,276 truck movements; and
- There were 412,909 tonnes of material taken offsite as a product.

Truck movements and materials taken offsite have decreased in 2023 compared to 2022.

Management measures relating to traffic include:

- Defined haulage times;
- Covered loads leaving site;
- Defined haulage limits; and

- Trained transport operators.

#### **6.5.4 Proposed Improvements**

There are no proposed improvements relating to transport.

## 6.6 Biodiversity

### 6.6.1 Environmental Assessment Predictions

The Environmental Assessment (2014) assessed the biodiversity impacts associated with clearing an additional 1.284 hectares of native vegetation. The Flora and Fauna Assessment accompanying the EIS stated: “With the implementation of flora and fauna management measures included in the Flora and Fauna Management Plan and this Environmental Assessment (2014), (depending on the outcome of the targeted surveys for the Eastern Underground Orchid) the proposed modification would not result in any significant impacts on biodiversity on site and in surrounding bushland”.

### 6.6.2 Approved Criteria

There are no specific criteria relating to biodiversity within the Development Consent. Schedule 3 Condition 25 outlines the requirement to complete a *Biodiversity and Rehabilitation Management Plan* (BRMP).

### 6.6.3 Key Environmental Performance

No bushfires occurred in the 2023 reporting period.

Weed spraying targeting Lantana (*Lantana* sp.) and Tobacco weed (*Solanum mauritianum*) were completed during the reporting period. Weed spraying was generally performed twice per month in this reporting period.

No feral animals were noted during this reporting period, with minimal issues reported in the past. Feral animal control programs are implemented on an as-needs basis due to the infrequent sightings and issues.

Biodiversity monitoring was conducted quarterly in 2023 to meet requirements of the approved BRMP (2018). Quarterly monitoring was undertaken on the following dates:

- 23 March 2023
- 28 June 2023
- 29 September 2023
- 14 December 2023.

The biodiversity monitoring reports are attached to this Annual Review in **Appendix 3**. The main findings of monitoring include:

- Weed species are the major concern at the Jandra Quarry, including Crofton Weed (*Ageratina Adenophora*), Stinking Roger (*Tagetes minuta*), Lantana (*Lantana camara*) and Wild Tobacco (*Solanum mauritianum*), are most common on the edges of native vegetation, around the active areas of the quarry, and on benches
- Erosion throughout the quarry area was generally well contained with minimal noted during inspections.
- The upper benches have been previously revegetated with tubestock and Eucalyptus spp. which are now several metres in height. Holcim will continue to monitor these locations.

Nest boxes were destroyed during the 2019/2020 bushfires, with replacements being installed in late 2020 including in the Biodiversity Offset Area. Holcim engaged an ecologist to undertake the annual monitoring of the nest boxes, which occurred in September 2023. During the annual monitoring, two of the 13 were occupied by Brushtail Possum (*Trichosurus vulpecula*), the remainder were not occupied. See **Appendix 3**.

## Comparison to EIS Predictions

There were limited impacts to biodiversity within the Annual Review period. This is consistent with the EIS predictions.

### 6.6.4 Management Measures

Management measures relating to biodiversity are outlined within the *Jandra Quarry Biodiversity Rehabilitation Management Plan (2018)*. These include:

- Weed and feral animal management;
- Pre-clearance surveys and tree felling procedures;
- Salvaging of habitat resources;
- Nest box installation;
- Erosion and sedimentation control;
- Bushfire management; and
- Rehabilitation and biodiversity offset area monitoring.

### 6.6.5 Proposed Improvements

Weed spraying will continue at the site during the next reporting period.

The biodiversity monitoring recommended the following actions:

- High-threat woody weeds should be prioritised for control before non-woody and annual weeds. Weeds such as Lantana and Tobacco Bush are a high priority.
- Drone / aerial weed control prioritised for areas not accessible via foot.
- Once remote weed spraying of the benches has been conducted, seeding of the benches, again using drones, should be investigated and if feasible, conducted.
- Mature tree and shrub planting along the benches of the Overburden Stockpile Area (OSA). The outer benches of the OSA would benefit from additional planting as the current shrub and tree cover is limited. Furthermore, planting mature trees and shrubs would contribute to shading out some of the exotic grasses.

Jandra will continue to assess the feasibility of options for weed management in hard-to-access rehabilitation areas such as drone spraying.



## **6.7 Heritage**

### **6.7.1 Environmental Assessment Predictions**

An extensive AHIMS search was conducted on 5 February 2014 for the purposes of an Aboriginal Heritage Due Diligence Assessment for the Environmental Assessment (2014). The search covered an area of approximately 10 square kilometers, which encompassed the disturbance area of the new heavy vehicle access road and expansion of the existing finished product stockpile area. Seven recorded sites are within the Jandra Quarry Development Consent boundary. All seven of these sites were determined to be of low or medium significance. No Aboriginal archaeological sites registered on AHIMS are located within the disturbance area of the new heavy vehicle access road and expansion of the existing finished product stockpile area. There are no predicted detrimental impacts to Aboriginal and cultural heritage.

### **6.7.2 Approved Criteria**

There are no specific criteria relating to Aboriginal and Cultural Heritage within the Development Consent. Schedule 3 Condition 29 outlines the requirement to prepare an Aboriginal Cultural Heritage Management Plan.

### **6.7.3 Key Environmental Performance**

There were no issues relating to Aboriginal and Cultural Heritage in 2023.

### **6.7.4 Management Measures**

Management measures relating to heritage are outlined within the Jandra Quarry Aboriginal Cultural Heritage Management Plan. These include:

- Consultation with Aboriginal stakeholders during the preparation of the Jandra Quarry Aboriginal Cultural Heritage Management Plan;
- Records of known sites of Aboriginal heritage significance;
- The Quarry Manager or delegate will undertake monthly inspections of the known Aboriginal and cultural heritage sites;
- Training of staff and contractors; and
- Procedure for impacts of unexpected finds.

### **6.7.5 Proposed Improvements**

No further improvements are proposed for 2024.

## 6.8 Waste Minimisation

### 6.8.1 Key Environmental Performance

Waste management at Jandra continued in 2023 with this including recycling and general waste. A summary of the waste generated by Jandra is shown in **Table 26**. These volumes are an approximate value based on the number of times the contractor collects waste from the site and the volume of the waste containers. Waste is routinely collected and is managed as part of Jandra Quarry's *Environmental Management Strategy*, as discussed in **Section 6.8.2**.

**Table 26: Waste Summary**

Waste Source	2022	2023
Scrap Steel	11,402kg	26,680kg
General Waste - Rubbish	12,471kg	12,471kg
General Waste - Cardboard	9,977kg	9,977kg
Industrial Waste	3,200kg	3,200kg
Waste Oil	8,000L	8,000L
Septic	-	7,000L
Oily Water	-	8,900L

**Table 26** shows that waste generated by the site in 2023 is generally consistent with the previous 2022 reporting period.

### 6.8.2 Management Measures

Wherever possible, Jandra Quarry implements initiatives to minimise the waste generated from operations. General waste is minimised, and all oil, cardboard, paper and steel are sorted on site and sent to recycling facilities in the region. This significantly reduces the amount of waste going to landfill.

Tyres from machinery are used for traffic management, garden edging and signage stabilisers. This reduces the use of raw materials as well as diverting rubber from landfill.

General waste and recycling are separated into different streams and stored in separate 3m<sup>3</sup> bins. These bins are collected fortnightly.

### 6.8.3 Proposed Improvements

There are no proposed improvements to waste management for 2024, however Jandra will continue to look for opportunities to reduce waste where possible.

## 7 WATER MANAGEMENT

### 7.1 EIS Predictions

The predictive modelling within the Environmental Assessment (July 2014) pertains to the water balance for Jandra Quarry (**Table 27**). During the reporting period, the water available on site was all that was required for operations providing Holcim with confidence in the water balance figures. There are no other predictive figures for surface water management.

**Table 27: Water Balance Results for varying stages of quarry development.**

Summary Results	Current			Stage 1		
	Dry Year	Mean Year	Wet Year	Dry Year	Mean Year	Wet Year
Total Runoff (ML/yr)	35	98	165	34	97	164
Total Demands (ML/yr) <sup>1</sup>	25.60	24.88	24.11	36.60	35.64	34.63
Stormwater Supplied (ML/yr) <sup>2</sup>	25.46	24.88	24.11	32.13	35.45	34.63
Total Storage Top Up (ML/yr)	0.13	0.00	0.00	4.46	0.19	0.00
% Demand Met	99%	100%	100%	88%	99%	100%
Spill Volume (ML/yr)	4	68	131	3	57	112

Summary Results	Stage 2			Stage 3		
	Dry Year	Mean Year	Wet Year	Dry Year	Mean Year	Wet Year
Total Runoff (ML/yr)	39	110	186	45	129	219
Total Demands (ML/yr)	36.42	35.47	34.46	34.60	33.74	32.82
Stormwater Supplied (ML/yr)	32.32	35.34	34.46	31.85	33.74	32.82
Total Storage Top Up (ML/yr)	4.09	0.13	0.00	2.75	0.00	0.00
% Demand Met	89%	100%	100%	92%	100%	100%
Spill Volume (ML/yr)	4	70	139	9	90	174

The Environmental Assessment (2014) stated “with the implementation of surface water management measures included in the Soil and Water Management Plan, the EPL and this EA, the proposed modification would not result in any significant impacts on the downstream environments.”

### 7.2 Approved Criteria

The site is required to monitor and record discharge events from the Main Dam offsite in accordance with the requirements listed in **Table 28** taken from the EPL.

**Table 28: EPL Discharge Monitoring Requirements**

**POINT 1**

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
pH	pH				6.5-8.5
Total suspended solids	milligrams per litre				50

*Water and land*

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Discharge quality monitoring	Discharge quality monitoring	Discharge from final sediment dam as shown in the CSR Readymix Site Photo - Jandra Quarry Water Monitoring Location Figure 1 provided to the EPA 13 May 2002

### 7.3 Surface Water Results

The *Surface Water Management Plan* outlines the EPL 2796 requirement to complete monitoring of discharge events at the final sediment dam. Monthly water monitoring was discontinued in July 2018 and will only be completed if there is a discharge event. As no discharges occurred on site during the 2023 reporting period, no surface water monitoring data is presented in this Annual Review.

**Long-term Trends:**

The results from 2015 to 2018 were reviewed for surface water in the 2018 Annual Review. Results were similar over a long period with slightly alkaline pH and a large variability in TSS results. No discharge events have occurred on site since 2019. Jandra Quarry has a system in place at the site where samples are obtained prior to a discharge event, with the goal of containing water onsite if the water quality parameters are not within the EPL requirements. No data is provided in the 2023 Annual Review, as no discharges occurred.

**Comparison to EIS Predictions:**

The Environmental Assessment (2014) stated the increase in scale of the operations would not result in any significant impacts on the downstream environments. With there being no discharge events that triggered the monitoring requirements during the Annual Review period and the site operating as per the SWMP, Holcim considers this prediction has been met.

### 7.4 Groundwater Results

Jandra Quarry is unlikely to experience groundwater inflow and highly unlikely to impact groundwater (*Soil and Water Management Plan*, 2015). No groundwater monitoring program was implemented at Jandra during the Annual Review period. Some sampling was done in February 2020 as precautionary monitoring, however no impacts were recorded.

### **7.4.1 Water Take**

There are no groundwater extraction licenses at Jandra Quarry, therefore there has been no water take.

## **7.5 Water Use and Storage**

Effective control of erosion and sediment movement at the site is currently achieved via the following measures:

- Sedimentation basins;
- Wash off water collection and primary treatment systems;
- Minimisation of disturbed areas;
- Diversion of clean water from undisturbed areas around working areas;
- Temporary erosion and sediment controls prior to commencement of topsoil and overburden removal;
- Sequential clearing and rehabilitation of the quarry as extraction of material proceeds; and
- Twice yearly maintenance of erosion and sediment control structures to ensure their efficiency.

## 8 REHABILITATION AND LANDSCAPE MANAGEMENT

### 8.1 Rehabilitation Performance during the Reporting Period

Holcim performed management measures outlined in the Biodiversity and Rehabilitation Management Plan in this report period in order to fully comply with DA 213-10-99 (Mod 5) Schedule 3 Condition 27.

The Rehabilitation and Conservation Bond value was established in consultation with external advisors and DPHI as per the requirements of Schedule 3 Condition 27. Instruments regarding the security of the Biodiversity Offset Area was closed out in discussion with authorities and established in 2020.

A summary of rehabilitation at Jandra Quarry is outlined in **Table 29**.

**Table 29: Rehabilitation Performance**

Guideline Requirement	Site Comment
Extent of the operations and rehabilitation at completion of the reporting period	The upper benches have been previously revegetated with tubestock and <i>Eucalyptus spp.</i> which are now several metres in height. The lower benches have been left to revegetate naturally due to safety issues.
Agreed post-rehabilitation land use	The Biodiversity and Rehabilitation Management Plan outlines the proposed rehabilitation at the site. The proposed final land use is native woodland.
Key rehabilitation performance indicators	Key performance indicators are outlined within the Biodiversity and Rehabilitation Management Plan. Rehabilitation inspections are completed by Holcim. Results of biodiversity monitoring and inspections by contractors enhance data collection on performance indicators.
Renovation or removal of buildings	There was no renovation or removal of buildings in 2023.
Any other Rehabilitation including: <ul style="list-style-type: none"> <li>● Exploration activities;</li> <li>● Infrastructure;</li> <li>● Dams; and</li> <li>● The installation or maintenance of fences, bunds and any other works.</li> </ul>	No additional new rehabilitation of exploration, infrastructure or dams was undertaken during the Annual Review period.
Any rehabilitation areas which have received formal sign off from the Resources Regulator	None.
Variations to activities undertaken to those proposed (including why there were variations and whether Resource Regulator was notified).	Rehabilitation was completed as per the <i>Biodiversity and Rehabilitation Management Plan</i> . No rehabilitation was completed in 2023.
Outcomes of trials, research projects and other initiatives	No trials.
Key issues that may affect successful rehabilitation	There are several potential issues including availability of material, seed stock, climatic events and rehabilitation

Guideline Requirement	Site Comment
	<p>methodology.</p> <p>As mentioned in <b>Section 6.6.5</b> a major bushfire event occurred in 2019 which resulted in all rehabilitation areas being burnt. Assessment of the recovery of these areas has been undertaken through quarterly biodiversity inspections.</p> <p>2023 reports indicate that while weeds are present at site, there is good native vegetation cover along dam walls and benches</p>

Grass seeding has also occurred on top of the bund as shown in **Photo 1**.



**Photo 1: Active Rehabilitation of benches at Jandra Quarry (2023)**

## 8.2 Summary of Current Rehabilitation and Disturbance

A summary of the rehabilitation and disturbance status is outlined in **Table 30**.

**Table 30: Rehabilitation and Disturbance Status**

Quarry Area Type	2019 (ha)	2020 (ha)*	2021 (ha)*	2022 (ha)*	2023 (ha)*	2024 (Predicted)
A. Total Quarry Footprint <sub>1</sub>	25.7	25.1	25.1	25.1	25.1	25.1
B. Total Active Disturbance <sub>2</sub>	22.9	19.2	17.7	19.5	19.7	19.7
C. Land Being Prepared for Rehabilitation <sub>3</sub>	0	0	0	0	0	0
D. Land Under Active Rehabilitation <sub>4</sub>	2.8	5.9	7.4	7.55	7.55	8
E. Completed Rehabilitations <sub>5</sub>	0	0	0	0	0	0

Note: \*areas updated based on a review of GIS.

1 Total disturbance and rehabilitation.

2 Total disturbance within the Development Consent boundary

3 Rehabilitation being shaped in a phase of decommissioning, landform establishment and growth medium development.

4 rehabilitation under a phase of ecosystem and land use establishment or ecosystem and land use sustainability

5 This refers to rehabilitation that has been signed off from the Resources Regulator.

During 2022, an inactive bench was prepared with the application of overburden and topsoil, increasing the land under active rehabilitation by 0.15ha. This continued into the 2023 reporting period.

It is expected that during the 2024 reporting period, an additional 0.6ha of land will be under active rehabilitation, with this being allowed to self-seed.

Rehabilitation monitoring was undertaken in 2023 in the form of inspections and reporting done by contractors on a quarterly basis. Biodiversity Offset Area monitoring continued in 2023.

The nest boxes at Jandra were destroyed or significantly damaged as a result of the 2019 bushfire. Consequently, new nest boxes were installed during the 2020 reporting period. During the 2022 reporting period, a further 8 nest boxes were installed within the Biodiversity Offset Area. There are a total of 13 nest boxes in the Biodiversity Offset Area, with annual monitoring occurring in September 2023.

### Actions for the Next Reporting Period

The DPHI 2015 Annual Review Guidelines require the Annual Review to outline the rehabilitation actions proposed during the next reporting period. These actions are detailed in **Table 31**.



**Table 31: Rehabilitation and Closure Actions for the Next Reporting Period**

Requirement	Site Comment
Describe the steps to be undertaken to progress agreement during next reporting period, where final rehabilitation outcomes have not yet been agreed between stakeholders	Rehabilitation to continue as per the Biodiversity and Rehabilitation Management Plan.
Outline proposed rehabilitation trials, research projects and other initiatives to be undertaken during next reporting period	No proposed rehabilitation trials. It should be noted Holcim is investigating the use of drone on short benches which are difficult to access.
Summary of rehabilitation activities proposed for next report period	Maintenance of rehabilitation on bench RL50 will continue. Rehabilitation preparation will continue on the eastern side of this area in 2022 ( <b>Figure 3</b> ).

The rehabilitation and disturbance areas at Jandra Quarry are outlined in **Figure 3**.



Figure 3: Jandra Quarry Rehabilitation and Disturbance - Source: Propellor - Date: December 2023

**Figure 3: Jandra Quarry Rehabilitation and Disturbance (2023)**

## 9. SUMMARY OF ENVIRONMENTAL PERFORMANCE

A summary of the performance of environmental management measures and sampling results are detailed in **Table 32**.

**Table 32: Summary of Performance**

Aspect	Approval Criteria/EIS Prediction	Performance During the Reporting Period	Trend/Key Management Implications	Implemented/Proposed Management Actions
<b>Noise</b>	EIS predictions are all below Development Consent criteria.	Quarterly monitoring has met the Development Consent Criteria.  Annual monitoring begun as per the varied EPL.	Noise results continue to remain within approved criteria and EIS predictions.	No additional changes necessary.  Holcim to ensure all incidents are notified to DPHI and EPA
<b>Air Quality</b>	EIS predictions are all below development consent criteria.	PM10, and TSP results are within criteria of EPL and Development Consent.	PM <sub>10</sub> and TSP results are consistent with previous Annual Review results.	None required.
<b>Blasting</b>	EIS predictions are all below development consent criteria.	Blast in 2023 were generally within the Development Consent criteria.  One blast exceedance occurred 6 June 2023  One ground vibration exceedance occurred 28 April 2023 however this was deemed compliant due to monitoring equipment and soil conditions.	Blast results generally continue to remain within approved criteria and EIS predictions except for the two exceedances in 2023.	Update monitoring locations to remove R2 and replace with another location due to limited access arrangements.  Continue to implement manages measure outlined within the noise and blast management plan.
<b>Water Management</b>	EIS predictions are all below development consent criteria.	No discharges in 2023 triggered surface water monitoring.	No monitored discharges have occurred since 2019.	None required.

Aspect	Approval Criteria/EIS Prediction	Performance During the Reporting Period	Trend/Key Management Implications	Implemented/Proposed Management Actions
<b>Biodiversity</b>	2014 EA Mod – The proposed modification would not result in any significant impacts on biodiversity on site and in surrounding bushland.	Quarterly biodiversity and rehabilitation monitoring was undertaken in 2023. No clearing was undertaken in 2023.	Biodiversity and rehabilitation monitoring was undertaken in 2023. Jandra Quarry continues to improve biodiversity monitoring and rehabilitation methods.	Continue to monitor as per the BRMP.
<b>Heritage</b>	No predictions.	No impacts.	Continued to be no impacts.	None required.

## **10 COMMUNITY**

### **10.1 Community Engagement Activities**

Holcim has maintained community engagement measures during the reporting period by undertaking the following activities in accordance with Schedule 5, Condition 7 and 10 of the Development Consent:

- Maintenance of a website (containing publicly available documents);
- A telephone number, email and postal address (on the website) for community complaints and feedback;
- A copy of the Complaints Register is maintained on the company website; and
- All documents and items displayed on the website are regularly updated by Holcim staff.

### **10.2 Community Contributions**

There were no Community Contributions during the 2023 reporting period.

### **10.3 Complaints**

A review of the Holcim Safety, Health & Environment reporting database did not identify any complaints from external stakeholders during the 2023 reporting period. This was also the case in 2020, 2021 and 2022. The quarterly reports for the complaints register are available to the public on the Jandra Quarry webpage.

Information to contact the site or to make a complaint is also available on this webpage. The link to this webpage is:

<http://www.holcim.com.au/about-us/community-link/jandra-quarry-possum-brush-taree-nsw.html>

## 11 INDEPENDENT AUDIT

In July 2022, Jandra Quarry undertook an Independent Environmental Audit (IEA) by NGH.

Jandra Quarry's IEA response and action plan is attached as **Appendix 4**.

The next IEA is due in 2025.

## 12 INCIDENTS AND NON-COMPLIANCES

Table 33 summarises the incidents and non-compliances at Jandra in 2023.

**Table 33: Summary of Incidents and Non-Compliances**

Date	Incident/Non-Compliance	Action/Comment
Annual Noise Monitoring	Non-Compliance	<p><b>Schedule 3 Condition 1 – Noise Criteria and EPL L4.2</b></p> <p>No monitoring was undertaken at receiver R2 due to access restrictions in 2023. Jandra is currently reviewing other monitoring locations and will liaise with EPA about removing this monitoring location due to access issues.</p>
June 2023	Non-compliance	<p><b>Schedule 3 Condition 5 – Blasting</b></p> <p>A blast on 6 June exceeded the overpressure limit of 115dB. The blast was recorded to be 115.4dBL. There was a total of 16 blasts during the 2023 reporting period.</p>

## 13 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

Holcim staff will undertake the following works and improvement measures and projects in 2024 to ensure compliance with the consent and to ensure that effective environmental management controls are operating in accordance with the requirements of the Consent.

**Table 34: Proposed Improvement Measures - 2024**

Improvement Measure	Activities
Progressive Rehabilitation	The site will continue to progressively rehabilitate available areas.
Desilting of the sites main process pond/sediment Basin	The site will continue to manage sediment control structures through inspections and desilting of ponds. Tailings dams will be cleaned on an appropriate schedule.
Biodiversity	Weed spraying will continue at the site during the next reporting period. A Weed Action Plan will continue to be developed in 2024.
Noise	Jandra will liaise with EPA about removing or amending Noise Monitoring location R2 due to access issues.



## 14 APPENDICES

**APPENDIX 1**  
**TRANSPORT SUMMARY 2023**



## JANDRA QUARRY TRANSPORT 2023

2023	January		February		March		April		May		June		July		August		September		October		November		December	
	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)	Truck Movements	Volume (T)
Day 1		0	102	3227.71	50	1432.7	2	40.66	82	1969.74	63	1594.4		0	52	1640.74	55	1921.4		0	55	1599.6	30	860.42
Day 2		0	98	3024.54	55	1581.57		0	63	1663.86	56	1413.58		0	61	1797.83		0		0	74	1750.55		0
Day 3		0	65	1895.41	45	1182.48	47	1540.22	59	1427.2		0	81	2347.36	57	1635.86		0	71	2286.15	48	1422.82		0
Day 4		0		0		0	47	1504.08	49	1364.35		0	30	620.12	47	1476.12	50	1575	53	1628.97		0	60	1879.73
Day 5		0		0		0	28	923.72	49	1336	73	1938.73	73	2198.53		0	71	2129.36	42	1358.36		0	72	2033.79
Day 6		0	48	1559.32	58	1659.23	33	1003.78		0	66	1879.82	76	2295.4		0	60	1901.2	39	1250.06	41	1351.62	62	1628.02
Day 7		0	84	2723.88	79	2192.07		0		0	57	1584.78	49	1555.78	77	2307.61	71	2177.96		0	44	1264.81	79	2316.06
Day 8		0	88	2711.03	101	2789.54		0	53	1437.54	87	2116.44		0	38	1156.88	60	1890.55		0	62	1802.45	57	1753.81
Day 9	47	1479.09	73	2338.25	95	2783.03		0	50	1461.8	44	1340.9		0	64	1789.89	26	658.62	50	1343.06	52	1569.95	15	456.64
Day 10	52	1475.79	68	1911.43	69	2021.57		0	70	1978.33		0	59	1739.18	72	1915.8		0	44	1309.6	52	1634.41		0
Day 11	62	1978.26		0	4	109.28	43	1076.38	58	1567.66		0	61	1554.99	91	1627.36	74	2313.68	52	1509.66		0	58	1772.71
Day 12	68	2005.97		0		0	63	1832.5	40	1150.82		0	68	1877.5		0	48	1363.46	60	1705.88		0	60	1776.04
Day 13	33	1066.66	86	2515.47	57	1676.97	52	1578.14	2	49.88	62	1614.27	64	2252.45		0	42	1256.74	65	1728.38	59	1857.16	47	1460.76
Day 14		0	73	2168.5	31	928.62	35	1072.52		0	49	1473.1	70	2131.36	59	1285.44	41	1257.9		0	65	2007.94	55	1847.36
Day 15		0	50	1394.79	104	2830.46		0	52	1579.21	57	1603.72		0	68	1489.2	47	1391.78		0	53	1624.69	42	1424.46
Day 16	67	2135.4	72	1872.36	79	2269.2		0	52	1427.96	53	1589.92		0	92	1786.13		0	52	1507.76	52	1539.96		0
Day 17	77	2029.28	26	867.65	65	1825.37	60	1544.31	38	1049.54		0	60	1418.36	85	1889.1		0	53	1667.79	30	916.3		0
Day 18	70	2163.71		0		0	61	1572.95	37	1135.64		0	60	1613.38	42	1104.84	56	1597.28	65	1909.42		0	57	1613.94
Day 19	59	1738.48		0		0	53	1495.96	57	1729.74	90	2821.88	60	1636.92		0	43	1319.64	93	2989.14		0	46	1358.79
Day 20	19	560.24	63	1845.42	66	2012.41	53	1730.14		0	79	2168.46	67	1877.62		0	42	1266.19	48	1559.88	53	1695.21	41	1305.59
Day 21		0	55	1667.92	81	2071.92	38	1166.62		0	87	2636.5	74	1776.7	38	1189.1	41	1292.84		0	62	1955.22	17	504.82
Day 22		0	59	1910.31	86	2112.62		0	69	2268.57	80	2466.37		0	100	2256.52	50	1510.27		0	53	1628.48		0
Day 23	58	1559.6	49	1442.44	71	1807.06		0	69	2157.87	75	2395.7		0	119	2454.04		0	75	1893.72	62	1990.17		0
Day 24	74	2386.67	56	1464.76	60	1675.4	42	1340.36	54	1757.98	4	156.7	44	1298.26	46	1212.6		0	85	2419.52	40	1111.34		0
Day 25	51	1524.72		0	4	131.02		0	71	2265.61		0	40	1112.59	50	1681.85	51	1555.01	80	2664.37		0		0
Day 26		0		0		0	59	1794.9	62	1899.11	44	1479.05	67	1790.28		0	64	1608.6	24	670.44		0		0
Day 27	34	925.77	45	1265.32	73	2124.06	73	1809.54		0	71	2060.58	72	1914.04		0	42	1365.26	16	483.38	30	1072.65		0
Day 28		0	51	1538.32	66	1597.97	45	1262.26		0	72	2160.87	39	932.29	70	2284.97	49	1405.37		0	45	1390.99		0
Day 29		0			34	867.02	4	97.24	56	1767.78	102	2782.58		0	96	2775.32	52	1488.96		0	49	1194.04		0
Day 30	45	1309.02			29	717.48			81	2356.88	54	1774.62		0	55	1921.48		0	30	844.14	41	1311.25		0
Day 31	58	1691.58			54	1357.24			67	2101.4			55	1799.34	41	1437.57		0	31	913.7				0
<b>TOTAL</b>	<b>874</b>	<b>26030.24</b>	<b>1311</b>	<b>39344.83</b>	<b>1516</b>	<b>41756.29</b>	<b>838</b>	<b>24386.28</b>	<b>1340</b>	<b>38904.47</b>	<b>1425</b>	<b>41052.97</b>	<b>1269</b>	<b>35742.45</b>	<b>1520</b>	<b>40116.25</b>	<b>1135</b>	<b>34247.07</b>	<b>1128</b>	<b>33643.38</b>	<b>1122</b>	<b>33691.61</b>	<b>798</b>	<b>23992.94</b>
<b>TOTAL VOLUME</b>	<b>412,909</b>	<b>(Q1 = 107,131 T Q2 = 104,344 T Q3 = 110,106 T Q4 = 91,328 T)</b>																						
<b>TOTAL TRUCK MOVEMENTS</b>	<b>14,276</b>																							

**APPENDIX 2**  
**ANNUAL**  
**NOISE MONITORING REPORT**

Intended for  
**Holcim (Australia) Pty Ltd**

Document type  
**Report**

Date  
**June 2023**

Project number  
**318000911**

# **ANNUAL NOISE MONITORING ASSESSMENT 2023 JANDRA QUARRY, POSSUM BRUSH, NSW**

## **ANNUAL NOISE MONITORING ASSESSMENT 2023 JANDRA QUARRY, POSSUM BRUSH, NSW**

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Project name **Annual Noise Monitoring Assessment 2023 for Jandra Quarry**  
Project no. **318000911**  
Recipient **David Saville, Peter Wilson**  
Document type **Report**  
Version **1**  
Date **26/06/2023**  
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Approved by **Belinda Sinclair**  
Description **Data collected on 17 May 2023 and 18 May 2023 for the annual noise monitoring program at Jandra Quarry, Possum Brush, NSW**

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## ABBREVIATIONS AND DEFINITIONS

<b>Ambient Noise</b>	The all-encompassing noise within a given environment. It is the composite of sounds from many sources, both near and far.
<b>Background noise</b>	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is described using the LA90 descriptor (see below).
<b>dB</b>	Abbreviation for decibel, a measure of sound equivalent to 20 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure, and 10 times the logarithm of a given sound power to a reference power.
<b>dB(A)</b>	A measure of A-weighted sound levels. A Weighting is an adjustment made to the sound level measurement to approximate the response of the human ear.
<b>Extraneous noise</b>	Noise resulting from activities that are not typical of the area. Atypical activities may include construction, and traffic generated by holiday periods. Normal daily traffic is not extraneous noise.
<b>LA1</b>	The noise level, measured in dB(A), which is exceeded for 1 per cent of the measurement period.
<b>LA1(1min)</b>	The noise level, measured in dB(A), which is exceeded for 1 per cent of the time over a 1-minute measurement period, i.e., is exceeded for 0.6 seconds. This measure can approximate to the maximum noise level but may be less if there is more than 1 noise event during this 0.6 second period.
<b>LA10</b>	The noise level, measured in dB(A), which is exceeded for 10 per cent of the time.
<b>LA90</b>	The noise level, measured in dB(A), which is exceeded for 90 per cent of the time, referred to as the background noise level. This is considered to represent the background noise (see above).
<b>LAeq</b>	The level of noise equivalent to the energy average of noise levels occurring over a defined measurement period.
<b>LAeq (period)</b>	The average equivalent noise level, measured in dB(A), during a measurement period (e.g., 15-minute, day, evening, or night).
<b>LAm<sub>ax</sub></b>	The A-weighted sound pressure level that represents the maximum noise level measured over the time that a given sound is measured.
<b>NMA</b>	Noise Monitoring Assessment
<b>NMP</b>	Noise Management Plan
<b>RDC</b>	Regional Distribution Centre

Source: Noise Guide for Local Government (NSW EPA, 2013)



# 1. OVERVIEW

Ramboll Australia Pty Ltd (Ramboll) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Jandra Quarry ("the quarry") at Rooty Hill, NSW.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPI) (NSW EPA, 2017);
- Environment Protection Licence (EPL) 2796 (NSW EPA, 2021);
- Jandra Quarry Noise and Blast Management Plan (NBMP) (Holcim (Australia) Pty Ltd, 2018);
- Development Consent DA 213-10-99, Notice of Modification 2015 (Delegate of the Minister for Planning, 2015); and
- Australian Standard AS 1055:2018 Acoustics—Description and measurement of environmental noise (Standards Australia, 2018).

This NMA is part of the annual monitoring requirement set out in the Development Consent and the NBMP.

## 1.1 Site Location and Sensitive Receptors

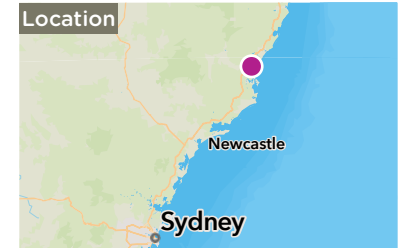
The quarry is located on the Pacific Highway at Possum Brush, approximately 17 km south of Taree, on the mid north coast of NSW. Receivers in the locality surrounding the quarry are primarily rural/residential. The Pacific Highway is situated to the west of the site, with highway traffic a dominant noise source at receivers within its proximity. To the east, the quarry is bounded by rural properties with road noise from The Lakes Way dominating the acoustic environment. The monitoring locations with respect to the quarry and assessed receivers are presented in **Figure 1**.



**Legend**

- Noise monitoring location

**Figure 1: Noise monitoring locations at Jandra Quarry**



## 2. NOISE CRITERIA

The applicable noise criteria for this NMA according to the EPL, the NBMP and the Development Consent are shown in **Table 2-1** for both quarry operations only, and **Table 2-2** for quarry operations and asphalt production combined. It is noted that asphalt campaigns at Jandra Quarry are sporadic, however when the asphalt plant does operate it can operate for 24 hours a day.

M8.1 of EPL 2796 requires:

*"to assess compliance with the noise limits of this licence, attend noise monitoring must be undertaken:*

- a) during a period of normal quarry operations.*
- b) at each one of the noise monitoring locations listed in the noise limits table of this licence.*
- c) occur once annually in the reporting period.*
- d) occur during the night period as defined in the NSW Industrial Noise Policy, and in conjunction with an asphalt campaign if any such campaign occurs within the quarterly monitoring period."*

**Table 2-1: Quarry operations noise criteria**

Location	EPA ID	Quarry Operations	
		Shoulder <sup>1</sup> , Day <sup>2</sup> and Evening <sup>3</sup>	
		LAeq (15min)	
		dB(A)	
R4	14	36	
R5	15	40	
R6	16	36	
R7	17	35	

<sup>1</sup> 6 am–7 am Monday to Saturday  
<sup>2</sup> 7 am–6 pm Monday to Saturday  
<sup>3</sup> 6 pm–10 pm Monday to Saturday

**Table 2-2: Quarry operations and asphalt plant production noise criteria**

Location	EPA ID	Quarry Operations and Asphalt Plant Production		
		Shoulder <sup>1</sup> , Day <sup>2</sup> and Evening <sup>3</sup>	Night <sup>4</sup>	
		LAeq (15min)	LAeq (15min)	LA1 (1min)
		dB(A)		
R4	14	40	39	51
R5	15	41	39	51
R6	16	40	35	48
R7	17	36	35	48

<sup>1</sup> 6 am–7 am Monday to Saturday  
<sup>2</sup> 7 am–6 pm Monday to Saturday  
<sup>3</sup> 6 pm–10 pm Monday to Saturday  
<sup>4</sup> 10 pm–6 am Monday to Saturday

### 3. METHODOLOGY

The monitoring program was designed in accordance with the procedures described in Australian Standard AS 1055:2018 and the Approval Documents referenced in **Section 1**. The measurements were carried out using a RION Sound Level Meter NL-52 on Wednesday 17 May 2023 and Thursday 18 May 2023. The acoustic instrumentation used carries current NATA calibration and complies with AS/NZS IEC 61672-1:2013/2002 class 1. Calibration of all instrumentation was checked prior to and following measurements using a Pulsar Acoustic Calibrator 105 which carried a current NATA calibration and complies with IEC 60942:2003. Drift in calibration did not exceed  $\pm 0.3$  dBA.

Attended noise monitoring was conducted for 15-minutes in duration during the morning shoulder and day periods over two days. The operator also observed and recorded the audible contributing noise sources for the duration of the 15-minute monitoring periods. Attended noise monitoring was not conducted during the night period as no asphalt campaigns were conducted by the quarry during this period.

Where Jandra Quarry was not distinctly audible during the attended monitoring, the quarry contribution is estimated to be at least 10 dBA below the ambient noise level, as determined by the LA90.

## 4. RESULTS AND DISCUSSION

### 4.1 Location EPA13

Noise monitoring at location EPA13 was not completed as access approval was not able to be obtained from the resident.

### 4.2 Location EPA14

Noise monitoring at location EPA14 was completed on Wednesday 17 May 2023. The quarry was not audible during any monitored period during the day and morning shoulder. These results indicate that noise emissions from Jandra Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring event at Location EPA14 are presented in **Table 4-1**.

Noise sources included wind, motorway traffic and birds.

**Table 4-3-1: Noise survey results and observations for Location EPA14**

Date	Start Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Jandra Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmx	LAeq	LA90				
17-05-23	6:09 (Morning Shoulder)	66.1	47.9	43.8	WD: 40° WS: 2.8 m/s Rain: Nil	Background 40-53 Bird 59 Wind/leaves 46 Quarry inaudible	<34	36
17-05-23	7:01 (Day)	72.2	49.4	46.2	WD: 50° WS: 2.9 m/s Rain: Nil	Background 43-52 Bird 50-68 Quarry inaudible	<36	36

### 4.3 Location EPA15

Noise monitoring at location EPA15 was completed on Wednesday 17 May 2023. The quarry was not audible during any monitored period during the day and morning. These results indicate that noise emissions from Jandra Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring event at Location EPA15 are presented in **Table 4-2**.

Noise sources included motorway traffic, wind, rustling leaves and birds.

**Table 4-3-2: Noise survey results and observations for Location EPA15**

Date	Start Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Jandra Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmx	LAeq	LA90				
17-05-23	6:29 (Morning Shoulder)	63.4	46.8	45.9	WD: 60° WS: 2.2 m/s Rain: Nil	Background motorway traffic 43-48 Wind 45-47 Quarry inaudible	<36	40
17-05-23	7:21 (Day)	59.1	48.2	45.6	WD: 50° WS: 2.6 m/s Rain: Nil	Background motorway traffic 46-51 Wind/leaves 45-46 Bird 47-49 Quarry inaudible	<36	40

#### 4.4 Location EPA16

Noise monitoring at location EPA16 was completed on Wednesday 17 May 2023 and Thursday 18 May 2023. The quarry was not audible during any monitored period during the day and morning. These results indicate that noise emissions from Jandra Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring event at Location EPA16 are presented in **Table 4-3**.

Noise sources included motorway traffic and birds.

**Table 4-3-3: Noise survey results and observations for Location EPA16**

Date	Start Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Jandra Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmaz	LAeq	LA90				
18-05-23	6:38 (Morning Shoulder)	61.2	45.9	40.9	WD: 300° WS: 0.3 m/s Rain: Nil	Background motorway traffic 40-49 Birds 42-59 Quarry inaudible	<31	36
17-05-23	8:59 (Day)	67.7	44.3	38.6	WD: 300° WS: 2.8 m/s Rain: Nil	Background motorway traffic 40-44 Birds 42-63 Quarry inaudible	<29	36

#### 4.5 Location EPA17

Noise monitoring at location EPA17 was completed on Wednesday 17 May 2023 and Thursday 18 May 2023. The quarry was not audible during any monitored period during the day and evening. These results indicate that noise emissions from Jandra Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring event at Location EPA17 are presented in **Table 4-4**.

Noise sources included motorway traffic, birds, roosters, and goats.

**Table 4-3-4: Noise survey results and observations for Location EPA17**

Date	Start Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Jandra Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmx	LAeq	LA90				
18-05-23	6:10 (Morning Shoulder)	59.9	42.1	37.4	WD: 300° WS: 1.1 m/s Rain: Nil	Background motorway traffic <43 Birds 49 Roosters and goats 42-55 Quarry inaudible	<27	35
17-05-23	9:34 (Day)	65.9	42.1	38.3	WD:N/A WS: 0 m/s Rain: Nil	Background motorway traffic 38-39 Birds 39-43 Quarry inaudible	<28	35



## 5. CONCLUSION

Monitoring was carried out on Wednesday 17 May 2023 and Thursday 18 May 2023 at four locations selected as representative to the sensitive receptor's surroundings the Jandra Quarry. All locations monitored showed that the contribution from Jandra Quarry were below the noise criteria.

The results presented in this NMA show compliance with the relevant noise criteria at the Holcim Jandra Quarry, NSW.

## 6. REFERENCES

Delegate of the Minister for Planning (2015) 'Development Consent DA 213-10-99, Jandra quarry, Notice of Modification 13/3/2015'.

Holcim (Australia) Pty Ltd (2018) *Jandra Quarry Noise and Blast Management Plan (Revision D)*.

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**APPENDIX 3**  
**BIODIVERSITY MONITORING**  
**REPORTS**

# Jandra Quarry Quarterly Monitoring, March 2023

15284 Pacific Highway, Possum Brush NSW 2430

20235501

12 April 2023



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Charlestown, NSW 2290  
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[www.kleinfelder.com.au](http://www.kleinfelder.com.au)

25 October 2023

20235501

Holcim Pty Ltd  
Jandra Quarry  
15284 Pacific Highway  
Possum Brush NSW 2430

**Attention: Holcim Environmental Coordinator**

**Subject:** Jandra Quarry Quarterly Monitoring, March 2023  
15284 Pacific Highway, Possum Brush NSW 2430

## 1 INTRODUCTION

Holcim (Australia) operates the Jandra Quarry, a hard quarry located approximately 18 kilometres south of Taree, New South Wales. The original development proposal for the quarry was granted on March 30, 2000 (DA231-1-99). A modification to the consent (MOD) was granted on March 13, 2015 (DA231-101-99 Mod 5) allowing for an increase in production and transportation of quarry products to maximum limit of 475,000 tonnes per annum.

Kleinfelder have been engaged to conduct biodiversity monitoring of the Jandra Quarry rehabilitation areas on a quarterly basis, as stipulated in Section 6.1.1 of the Biodiversity Rehabilitation and Management Plan (BRMP) (Umwelt, 2018). Monitoring has previously been undertaken by Umwelt, until 2021. The outcomes of the quarterly monitoring will be included as part of the annual biodiversity monitoring report (Kleinfelder) for Jandra Quarry.

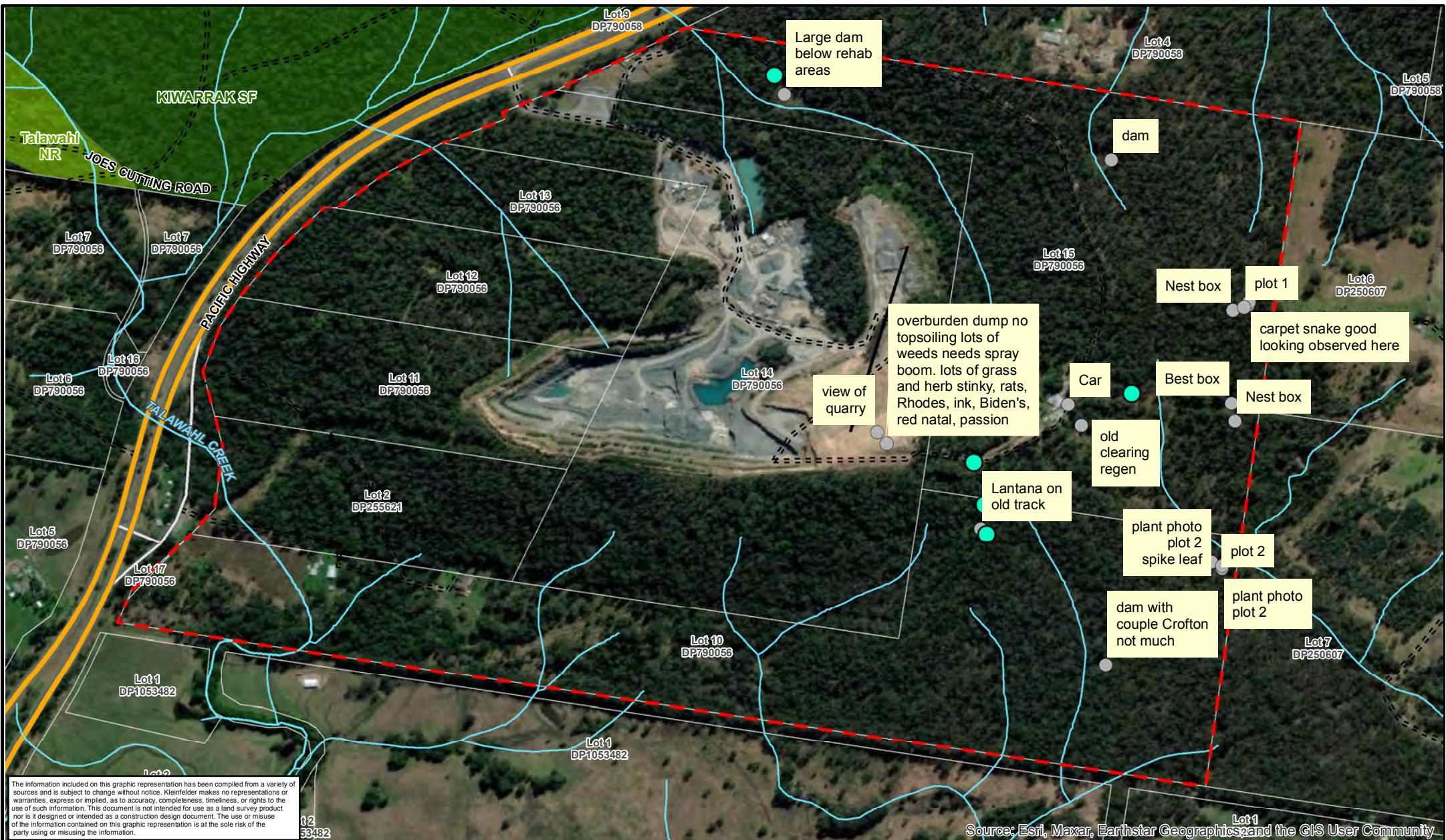
## 2 SCOPE

On 24 March 2023 a Kleinfelder ecologist, Jason Mark, attended Jandra Quarry to conduct a site-based inspection. Survey methodology was conducted in accordance with the BRMP and included an inspection of the rehabilitated areas to assess the following parameters:

- Stability and condition of the soil.
- Drainage and sediment control structures.
- Runoff water quality.
- Germination rates.
- Plant health.
- Natural regeneration.
- Weed infestations.

Each rehabilitated area, where accessible, was inspected on foot and observational data collected by a hand-held GPS. Two (2) photo monitoring points, one at the corner of Blackbutts Road and the Pacific Highway and one along Winmurra Drive, were established in 2021. Photos are taken at each location during each monitoring round as a means of visually comparing the aesthetics of the quarry over time.

Due to operational restrictions of the open-pit, the east, south and west benches could not be inspected on foot. This has also been the case during previous rehabilitation monitoring performed to date. Monitoring of these areas has previously been recommended to be conducted via a remote flyover using a drone and camera if access is not possible. Footage can then be analysed to best determine their condition based on the abovementioned parameters.



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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend	
<span style="color: cyan;">●</span> Weed Location (Point)	<span style="border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Lot Boundaries
<span style="color: grey;">●</span> Generic Point - Observation	<span style="background-color: #90EE90; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> National Park
<span style="border-bottom: 2px dashed red; width: 15px; display: inline-block;"></span> Jandra Quarry Boundary	<span style="background-color: #90EE90; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Forestry Corporation of NSW
	<span style="border-bottom: 3px solid yellow; width: 15px; display: inline-block;"></span> Primary Road
	<span style="border-bottom: 1px solid grey; width: 15px; display: inline-block;"></span> Local Road
	<span style="border-bottom: 2px dashed black; width: 15px; display: inline-block;"></span> Track

Metres

0 25 50 100 150 200 250

N

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PROJECT REFERENCE: 20235501
DATE DRAWN: 8/3/2023 10:19 Version 1
DRAWN BY: JCBrown
DATA SOURCE: NSW Government - 2023 Esri - 2023 Holcim - 2023

<b>Biodiversity Monitoring</b>
Holcim (Australia) Jandra Quarry Quarterly Rehabilitation Monitoring

FIGURE:  
**1**



## 3 RESULTS

Rehabilitated areas adjacent to the Overburden Stockpiling Area (OSA), the Active Pit (AP) and the Settlement Dam near the site office were inspected. **Figure 1** details observations made during the Quarter one monitoring which was done at the same time as the Annual monitoring.

### 3.1 OVERBURDEN STOCKPILE AREA

As Jandra is an active quarry, ongoing works such as depositing overburden material have occurred since the last inspection. Exotic species such as *Setaria sphacelata* (Pigeon Grass), *Melinis repens* (Red Natal Grass) and *Tagetes minuta* (Stinking Roger), *Lantana camara* (Lantana), *Solanum mauritianum* (Tobacco Bush), *Ageratina adenophora* (Crofton Weed) are evident in the OSA. Native species such as *Acacia longifolia* (Coastal Wattle), *Acacia maidenii* (Maiden's Wattle) and some *Eucalyptus spp.* are evident in low abundances but appear to be in a healthy condition. The northern section of the overburden stockpile area was not able to be inspected on the day as this was operational, and it was requested that it be avoided to facilitate ongoing work. The southern portion of the overburden stockpile area had rilling and small gullies, this was not considered to be a concern at present due to the operational nature of the area (moving landscape which will alter affected areas).

Near the former track from the Overburden Stockpile Area to the Settlement Dam near the office, it was noted that *Cinnamomum camphora* (*Camphor Laurel*) was present on a creek line.

### 3.2 ACTIVE PIT AREA

Access to the active pit area was restricted due to safety concerns. An inspection of the benches via drone was not conducted during this round of monitoring but is recommended for future events where access is not possible. Bench condition was interpreted as best as possible from a visual inspection at a safe distance. It was also noted during the inspection that the active pit area had evidence of erosion, however as this is constantly changing through the extraction process it is assumed that the landscape will be altered before erosion has long term effects.

Observations from distance suggest that as per previous findings, along the eastern rehabilitated benches, the upper benches show the highest cover of native species (namely *Eucalyptus spp.*) which are evidence of previous tubestock planting. The lower benches have been allowed to naturally regenerate. These areas typically contain a greater cover of exotic species, such as *Lantana camara* (Lantana).

### 3.3 SETTLEMENT DAM

A walkover of the edge of the Settlement Dam revealed good vegetation coverage along the dam walls and no areas of erosion or unintended water leakage were apparent. Some exotic species, such as *Lantana camara* (Lantana), *Solanum mauritianum* (Tobacco Bush) and *Paspalum sp.* have established themselves along the dam walls. Despite this, there is still good native species coverage, with species such as *Acacia longifolia*, *Acacia maidenii* and *Eucalyptus spp.* being the most common (**Plate 2**). Some evidence of erosion was noted on the top of the dam wall, this was small in nature and should be monitored for ongoing stability.

Visual inspection of water quality within the dam did not appear to be poor, with little signs of eutrophication (algal blooms). Furthermore, native emergent vegetation such as *Typha sp.* and *Bolboschoenus sp.* are evident along the margins of the dam and appear to be in good health.

### 3.4 PHOTO MONITORING

No apparent visual change is discernible compared to previous rounds of monitoring. **Appendix 3** provides a selection of photographs for visual comparison.

## 4 CONCLUSION

In line with the advice within previous rehabilitation monitoring reports, weed species are the major rehabilitation concern at the Jandra Quarry. The weeds noted as present include Crofton Weed, Lantana and Wild Tobacco, which are most common on the edges of native vegetation, around the active areas of the quarry. Ongoing treatment of these weeds is recommended mainly to ensure that infestations do not become more established and difficult to manage in the future, or act as sources for future spread and re-infestations. However, around the



Overburden Stockpile Area, these infestations are serving to stabilise soil and slow runoff, trapping sediment. Any weed treatment should consider the requirement for adequate erosion control..

The upper benches have been previously revegetated with tubestock and Eucalyptus spp. which are now several metres in height, with each bench having areas that have been colonised by exotic grasses, and in some instances Lantana and Wild Tobacco. The lower benches have been left to revegetate naturally due to safety issues and these have higher densities of exotic vegetation. For ideal revegetation some form of weed control or assisted introduction that factors in safety could be explored in the future, in conjunction with the natural revegetation.

No areas of poor water quality, or dieback of vegetation from surface water runoff, were observed. The Settlement Dam had no coverage of algae and was vegetated with native aquatic vegetation along its margins.

## 5 RECOMMENDATIONS

Recommendations have been developed based on the outcome of the site-based quarterly inspection of the OSA, AP and Settlement Pond areas. The following items are recommended which remain the same as those proposed previously.

- Intensive weed control along areas of high woody weed cover, i.e., north-eastern AP area where there is high cover of Lantana, Lower rehab benches along the eastern side of the AP area and upper benches of the OSA.
- Weed control should be structured so that methods are appropriate:
  - backpack spraying and hand removal of weeds should be prioritised in areas accessible on foot and which contain a mix of native and exotic species.
  - Quick spray areas of dense woody weed infestations with little native species mix, i.e., the 'ROM'
  - Drone / aerial weed control prioritised for areas not accessible via foot, i.e., lower benches of the AP area. A fly-over of the intended areas of control should be conducted first to gain a more accurate idea of species composition so as to reduce the risk of non-target damaged.
- Weed control should be conducted systematically to avoid large-scale initial removal of weeds, resulting in open areas of bare soil, leading to erosion.
- High-threat woody weeds should be prioritised for control before non-woody and annual weeds. Weeds such as Lantana and Tobacco Bush are a high priority.
- Intensive weed control targeting exotic grasses is not recommended, as exotic grasses are currently helping stabilise the benches. This approach should be staged over time and should be supported by additional native species plantings.
- Mature tree and shrub planting along the benches of the OSA. The outer benches of the OSA would benefit from additional planting as the current shrub and tree cover is limited. Furthermore, planting mature trees and shrubs would contribute to shading out some of the exotic grasses.

If you require additional information or clarification, please contact the undersigned at +61 421 555 894.

Sincerely,

**Kleinfelder Australia Pty Ltd**

**Jake Brown**

Ecologist





# APPENDIX 1 - SITE PHOTOS





**Plate 1** Photo monitoring point from Winmurra Drive.



**Plate 2** Dam below rehabilitated area.



**Plate 3**      **Rehabilitated benches along the eastern side of the AP area.**



**Plate 4**      **Rehabilitated benches**



**Plate 5** Overburden Stockpile Area.



**Plate 6** Camphor Laurel found on creek line near Pacific Highway.



# APPENDIX 2 - PHOTO COMPARSION FOR MONITORING

Winmurra Drive



June 2021



February 2022



March 2023



# Jandra Quarry Quarterly Monitoring, June 2023

15284 Pacific Highway, Possum Brush NSW 2430

20235501  
12 July 2023



Suite 3, 240-244 Pacific Highway,  
Charlestown, NSW 2290  
Phone: +61 2 4949 5200



Kleinfelder Australia Pty Ltd

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25 October 2023

20235501

Holcim Pty Ltd  
Jandra Quarry  
15284 Pacific Highway  
Possum Brush NSW 2430

**Attention: Holcim Environmental Coordinator**

**Subject:** Jandra Quarry Quarterly Monitoring, June 2023  
15284 Pacific Highway, Possum Brush NSW 2430

## 1 INTRODUCTION

Holcim (Australia) operates the Jandra Quarry, a hard quarry located approximately 18 kilometres south of Taree, New South Wales. The original development proposal for the quarry was granted on March 30, 2000 (DA231-1-99). A modification to the consent (MOD) was granted on March 13, 2015 (DA231-101-99 Mod 5) allowing for an increase in production and transportation of quarry products to maximum limit of 475,000 tonnes per annum.

Kleinfelder have been engaged to conduct monitoring of the Jandra Quarry rehabilitation areas on a quarterly basis, as stipulated in Section 6.1.1 of the Biodiversity Rehabilitation and Management Plan (BRMP) (Umwelt, 2018). Monitoring has previously been undertaken by Umwelt, until 2021. The outcomes of the quarterly monitoring will be included as part of the annual biodiversity monitoring report (Kleinfelder) for Jandra Quarry.

## 2 SCOPE

On 28 June 2023 a Kleinfelder ecologist, Jake Brown, attended Jandra Quarry to conduct a site-based inspection. Survey methodology was conducted in accordance with the BRMP and included an inspection of the rehabilitated areas to assess the following parameters:

- Stability and condition of the soil.
- Drainage and sediment control structures.
- Runoff water quality.
- Germination rates.
- Plant health.
- Natural regeneration, and;
- Weed infestations.

Each rehabilitated area, where accessible, was inspected on foot and observational data collected by a hand-held GPS. Two (2) photo monitoring points, one at the corner of Blackbutts Road and the Pacific Highway and one along Winmurra Drive, were established in 2021. Photos are taken at each location during each monitoring round as a means of visually comparing the aesthetics of the quarry over time (see **Appendix 3** for Selected images).

Due to operational restrictions of the open-pit, the east, south and west benches could not be inspected on foot. Monitoring of these areas was recommended to be conducted via a remote flyover using a drone and camera. Footage can then be analysed to best determine their condition based on the abovementioned parameters.

## 3 RESULTS

Rehabilitated areas adjacent to the Overburden Stockpiling Area (OSA), the Active Pit (AP) and the Settlement Dam near the site office were inspected (**Figure 1**). The observations observed are detailed in **Appendix 2**.





The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend	
<span style="color: green;">●</span> Observations	<span style="border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Lot Boundaries
<span style="color: green;">—</span> Observation	<span style="background-color: #90EE90; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> National Park
<span style="color: yellow;">▲</span> Weed Location	<span style="background-color: #90EE90; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Forestry Corporation of NSW
<span style="color: yellow;">—</span> Weed Location	<span style="border-bottom: 2px solid orange; display: inline-block; width: 15px;"></span> Primary Road
<span style="color: red;">- - -</span> Jandra Quarry Boundary	<span style="border-bottom: 1px solid gray; display: inline-block; width: 15px;"></span> Local Road
	<span style="border-bottom: 2px dashed black; display: inline-block; width: 15px;"></span> Track

Metres

0 25 50 100 150 200 250

PROJECT REFERENCE: 20235501
DATE DRAWN: 8/2/2023 14:40 Version 1
DRAWN BY: JCBrown
DATA SOURCE: NSW Government - 2023 Esri - 2023 Holcim - 2023

**Biodiversity Monitoring**

Holcim (Australia)  
Jandra Quarry  
Quarterly Rehabilitation Monitoring

FIGURE:

**1**

### 3.1 OVERBURDEN STOCKPILE AREA

As Jandra is an active quarry, minor works such as depositing overburden material have occurred since the last inspection. Exotic species such as *Setaria sphacelata* (Pigeon Grass), *Melinis repens* (Red Natal Grass) and *Tagetes minuta* (Stinking Roger), *Lantana camara* (Lantana), *Solanum mauritianum* (Tobacco Bush), *Ageratina adenophora* (Crofton Weed) are evident in the OSA. Native species such as *Acacia longifolia* (Coastal Wattle), *Acacia maidenii* (Maiden's Wattle) and some *Eucalyptus spp.* are evident in low abundances, but appear to be in a healthy condition. As previously noted from the inspections climber/twining species *Kennedia rubicunda* (Dusky Coral Pea), *Hardenbergia violacea* (Purple Coral Pea) and *Pultenaea villosa* (Hairy Bush-Pea) were also observed. Along the former track from the Overburden Stockpile Area to the Settlement Dam near the office, it also appeared that *Allocasuarina sp.* are naturally revegetating small sections, though evidence of weeds are also present.

During the inspection no active erosion was noticed, however some locations in the Overburden Stockpile Area, mainly around the eastern edge were observed to have captured water in the past. This appears to have protected the vegetated eastern slope. Bunding was at the Overburden Stockpile Area. The disturbed areas such as bunds appear to be key points for previously detailed weeds to occur.

### 3.2 ACTIVE PIT AREA

Bench condition was interpreted as best as possible from a visual inspection at a safe distance, and via photos (**Plate 4** and **Plate 5**). Some new erosion (minor land slip) was identified along the high wall (above the "white line") access track along the western AP area (**Plate 6**). Along the north-eastern AP area (ROM) previously noted excavated material falling into a Settlement Dam, appears to have settled and roughly matches the previous photograph (**Plate 7** shows June 2023). Furthermore, this area contains a high cover of Lantana (**Plate 8**).

Along the eastern rehabilitated benches, the upper benches show the highest cover of native species (namely *Eucalyptus spp.*) which are evidence of previous tubestock planting. The lower benches have been allowed to naturally regenerate. These areas typically contain a greater cover of exotic species, such as *Lantana camara* (Lantana) (**Plate 5**).

Recently prior to the inspection, the electricity easement on the western side of the pit area had been clear/maintained by the relevant authority. The increased visibility and access along the easement was used to inspect the slope running up to the quarry wall. As with the top side a number of weed species such as *Lantana camara* (Lantana) and *Solanum mauritianum* (Tobacco Bush) were present throughout the slope.

### 3.3 SETTLEMENT DAM

A walkover of the edge of the Settlement Dam revealed good vegetation coverage along the dam walls and no areas of erosion or unintended water leakage were apparent. Some exotic species, such as *Lantana camara* (Lantana), *Solanum mauritianum* (Tobacco Bush) and *Paspalum sp.* have established themselves along the dam walls. Despite this, there is still good native species coverage, with species such as *Acacia longifolia*, *Acacia maidenii* and *Eucalyptus spp.* being the most common (**Plate 9**). Some evidence of erosion was found along the bank from the Dam wall towards the road and along the former track from the Overburden Stockpile Area (it can be partially seen in **Plate 9**).

Water quality within the dam did not appear to be poor, with little signs of eutrophication (algal blooms). Furthermore, native emergent vegetation such as *Typha sp.* and *Bolboschoenus sp.* are evident along the margins of the dam and appear to be in good health.

### 3.4 PHOTO MONITORING

No apparent visual change is discernible compared to previous rounds of monitoring. **Appendix 3** provides a visual comparison.

## 4 CONCLUSION

As previously documented, weed species are the major concern at the Jandra Quarry the weeds include Crofton Weed, Lantana and Wild Tobacco, which are most common on the edges of native vegetation, around the active areas of the quarry. Ongoing treatment of these weeds is recommended mainly to ensure that infestations do not



become unmanageable in the future, or act as sources for future re-infestations. However, around the Overburden Stockpile Area, these infestations are serving to stabilise soil and slow runoff, trapping sediment. Any weed treatment should factor erosion control so as not to cause undue damage.

The upper benches have been revegetated with tubestock and Eucalyptus spp. are now several metres in height, with Each bench having areas that have been colonised by exotic grasses, and in some instances Lantana and Wild Tobacco. The lower benches have been left to revegetate naturally due to safety issues and these have higher densities of exotic vegetation. For ideal revegetation some form of weed control or assisted introduction that factors in safety could be explored in the future, in conjunction with the natural revegetation.

Besides the landslip on the high wall on the western (“white line”) side, the other evidence of erosion was minor predominantly around the Overburden Stockpile Area, though it was clear efforts are in place to limit erosion. Erosion throughout the quarry area was generally well contained, though continued monitoring and early prevention works if required should occur.

No areas of poor water quality, or dieback of vegetation from surface water runoff, were observed. The Settlement Dam had no coverage of algae and was vegetated with native aquatic vegetation along its margins.

## 5 RECOMMENDATIONS

Recommendations have been developed based on the outcome of the site-based quarterly inspection of the OSA, AP and Settlement Pond areas. The following items are recommended.

- Intensive weed control along areas of high woody weed cover, i.e., north-eastern AP area where there is high cover of Lantana, Lower rehab benches along the eastern side of the AP area and upper benches of the OSA.
- Weed control should be structured so that methods are appropriate:
  - backpack spraying and hand removal of weeds should be prioritised in areas accessible on foot and which contain a mix of native and exotic species.
  - Quick spray areas of dense woody weed infestations with little native species mix, i.e., the ‘ROM’
  - Drone / aerial weed control prioritised for areas not accessible via foot, i.e., lower benches of the AP area. A fly-over of the intended areas of control should be conducted first to gain a more accurate idea of species composition so as to reduce the risk of non-target damaged.
- Weed control should be conducted systematically to avoid large-scale initial removal of weeds, resulting in open areas of bare soil, leading to erosion.
- High-threat woody weeds should be prioritised for control before non-woody and annual weeds. Weeds such as Lantana and Tobacco Bush are a high priority.
- Intensive weed control targeting exotic grasses is not recommended, as exotic grasses are currently helping stabilise the benches. This approach should be staged over time and should be supported by additional native species plantings.
- Mature tree and shrub planting along the benches of the OSA. The outer benches of the OSA would benefit from additional planting as the current shrub and tree cover is limited. Furthermore, planting mature trees and shrubs would contribute to shading out some of the exotic grasses.

If you require additional information or clarification, please contact the undersigned at +61 421 555 894.

Sincerely,

**Kleinfelder Australia Pty Ltd**

**Jake Brown**

Ecologist

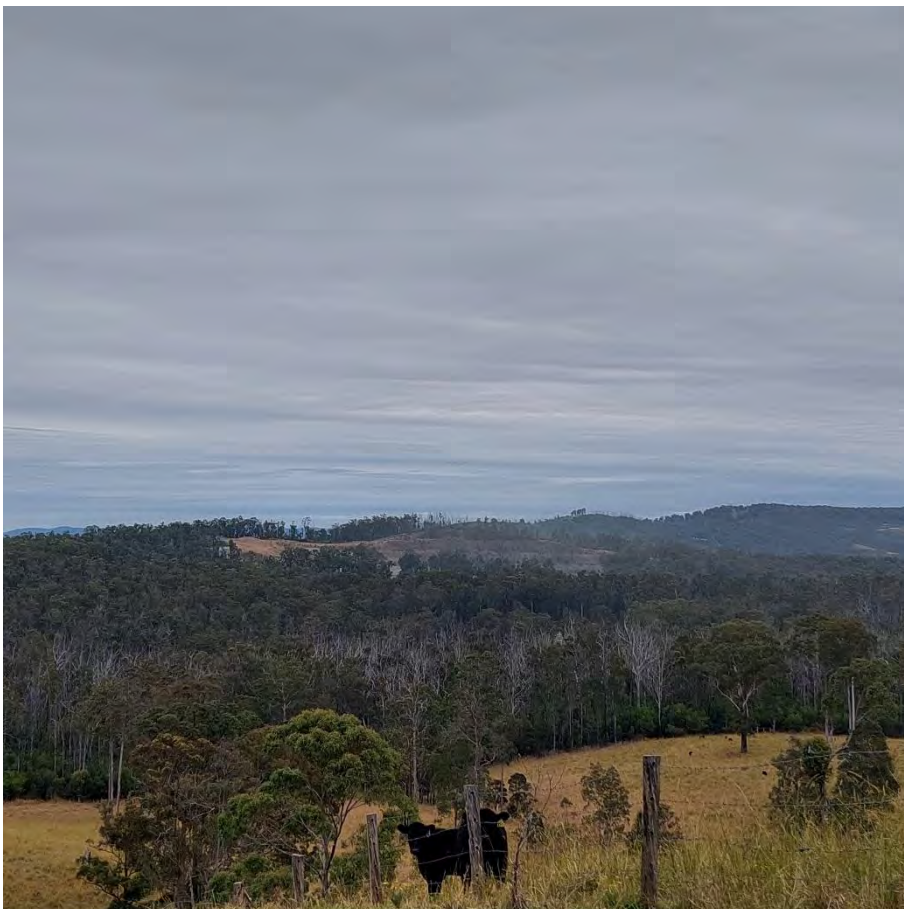


# APPENDIX 1 - SITE PHOTOS





**Plate 1** Phot monitoring point at the corner of Blackbutts Road and the Pacific Highway.



**Plate 2** Photo monitoring point from Winmurra Drive.



**Plate 3** Top of former track from dam near office to Overburden Stockpile Area.



**Plate 4** Rehabilitated benches along the eastern side of the AP area.



**Plate 5**      **Rehabilitated benches along the eastern side of the AP area.**



**Plate 6**      **Under-cut from erosion along the high-wall of the western AP area.**



**Plate 7** Excavated material perched on edge of settlement dam in the AP area near the ROM (previously noted in 2022 as falling into dam).



**Plate 8** Dense covering of Lantana along an area of the ROM (north-eastern side of the AP area).





**Plate 9** Native species growth (*Acacia longifolia* and *Eucalyptus* spp.) along the Settlement Dam wall.



**Plate 10** Erosion control / point in Overburden Stockpile Area.



## APPENDIX 2 - FIGURE 1 OBSERVATION NOTES

Number	Name
1	Erosion, wash out
2	Erosion on face of cut
3	Bund and drain
4	Lots of regrowth
5	Animal burrow
6	Burnt fence post
7	Some native pioneering
8	Erosion
9	Allocasuarina sp. are naturally revegetating on old track



# APPENDIX 3 – PHOTO COMPARSION FOR MONITORING

Winmurra Drive



June 2021



February 2022



May 2023



Blackbutt Road Intersection with Pacific Highway



June 2021



February 2022



May 2023



# Jandra Quarry Quarterly Monitoring, September 2023

15284 Pacific Highway, Possum Brush NSW 2430

20235501

25 October 2023



Suite 3, 240-244 Pacific Highway,  
Charlestown, NSW 2290  
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[www.kleinfelder.com.au](http://www.kleinfelder.com.au)

25 October 2023

20235501

Holcim Pty Ltd  
Jandra Quarry  
15284 Pacific Highway  
Possum Brush NSW 2430

**Attention: Holcim Environmental Coordinator**

**Subject:** Jandra Quarry Quarterly Monitoring, September 2023  
15284 Pacific Highway, Possum Brush NSW 2430

## 1 INTRODUCTION

Holcim (Australia) operates the Jandra Quarry, a hard quarry located approximately 18 kilometres south of Taree, New South Wales. The original development proposal for the quarry was granted on March 30, 2000 (DA231-1-99). A modification to the consent (MOD) was granted on March 13, 2015 (DA231-101-99 Mod 5) allowing for an increase in production and transportation of quarry products to maximum limit of 475,000 tonnes per annum.

Kleinfelder have been engaged to conduct monitoring of the Jandra Quarry rehabilitation areas on a quarterly basis, as stipulated in Section 6.1.1 of the Biodiversity Rehabilitation and Management Plan (BRMP) (Umwelt, 2018). Monitoring has previously been undertaken by Umwelt, until 2021. The outcomes of the quarterly monitoring will be included as part of the annual biodiversity monitoring report (Kleinfelder) for Jandra Quarry.

## 2 SCOPE

On 29 September 2023 a Kleinfelder ecologist, Jake Brown, attended Jandra Quarry to conduct a site-based inspection. Survey methodology was conducted in accordance with the BRMP and included an inspection of the rehabilitated areas to assess the following parameters:

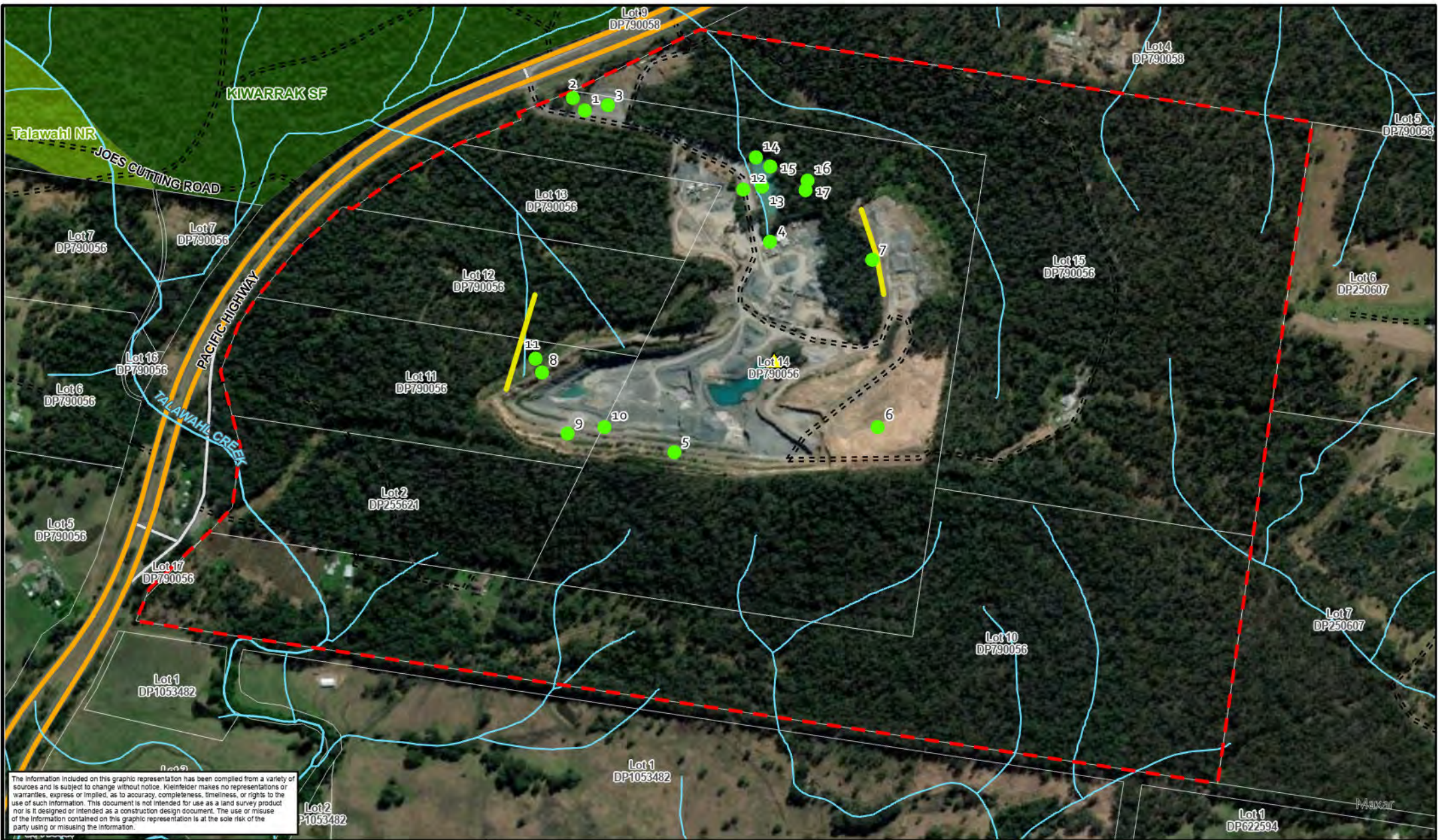
- Stability and condition of the soil.
- Drainage and sediment control structures.
- Runoff water quality.
- Germination rates.
- Plant health.
- Natural regeneration, and;
- Weed infestations.

Each rehabilitated area, where accessible, was inspected on foot and observational data collected by a hand-held GPS. Two (2) photo monitoring points, one at the corner of Blackbutts Road and the Pacific Highway and one along Winmurra Drive, were established in 2021. Photos are taken at each location during each monitoring round as a means of visually comparing the aesthetics of the quarry over time (see **Appendix 3** for Selected images).

Due to operational restrictions of the open-pit, the east, south and west benches could not be inspected on foot. Monitoring of these areas was recommended to be conducted via a remote flyover using a drone and camera. Footage can then be analysed to best determine their condition based on the abovementioned parameters.

## 3 RESULTS

Rehabilitated areas adjacent to the Overburden Stockpiling Area (OSA), the Active Pit (AP) and the Settlement Dam near the site office were inspected (**Figure 1**). The observations observed are detailed in **Appendix 2**.



The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

<b>Legend</b>	<ul style="list-style-type: none"> <li><span style="color: yellow;">▲</span> Weed Location</li> <li><span style="color: green;">●</span> Observations</li> <li><span style="border-bottom: 2px dashed red; width: 20px; display: inline-block;"></span> Jandra Quarry Boundary</li> <li><span style="border-bottom: 1px solid white; width: 20px; display: inline-block;"></span> Lot Boundaries</li> <li><span style="background-color: lightgreen; width: 20px; height: 10px; display: inline-block;"></span> National Park</li> <li><span style="background-color: lightgreen; width: 20px; height: 10px; display: inline-block;"></span> Forestry Corporation of NSW</li> <li><span style="border-bottom: 2px solid orange; width: 20px; display: inline-block;"></span> Primary Road</li> <li><span style="border-bottom: 1px solid grey; width: 20px; display: inline-block;"></span> Local Road</li> <li><span style="border-bottom: 2px dashed black; width: 20px; display: inline-block;"></span> Track</li> </ul>
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Metres

0 25 50 100 150 200 250

**KLEINFELDER**  
Bright People. Right Solutions.  
www.kleinfelder.com

PROJECT REFERENCE: 20235501
DATE DRAWN: 10/5/2023 08:25 Version 1
DRAWN BY: JCBrown
DATA SOURCE: NSW Government - 2023 Esri - 2023 Holcim - 2023

<b>Biodiversity Monitoring</b>
Holcim (Australia) Jandra Quarry Quarterly Rehabilitation Monitoring

FIGURE:  
**1**



### 3.1 OVERBURDEN STOCKPILE AREA

Overall, no major changes from the Quarter 2 visit were noted, except that the drier weather has resulted in vegetation died off and browning. As Jandra is an active quarry, minor works such as depositing overburden material have occurred since the last inspection. Exotic species such as *Setaria sphacelata* (Pigeon Grass), *Melinis repens* (Red Natal Grass) and *Tagetes minuta* (Stinking Roger), *Lantana camara* (Lantana), *Solanum mauritianum* (Tobacco Bush), *Ageratina adenophora* (Crofton Weed) are evident in the OSA. These have been affected by the drier weather. Native species such as *Acacia longifolia* (Coastal Wattle), *Acacia maidenii* (Maiden's Wattle) and some *Eucalyptus spp.* are evident in low abundances, but appear to be in a healthy condition. As previously noted from the inspections climber/twining species *Kennedia rubicunda* (Dusky Coral Pea), *Hardenbergia violacea* (Purple Coral Pea) and *Pultenaea villosa* (Hairy Bush-Pea) were also observed. Along the former track from the Overburden Stockpile Area to the Settlement Dam near the office, it also appeared that *Allocasuarina sp.* are naturally revegetating small sections, though evidence of weeds are also present.

During the inspection no active erosion was noticed in this area. The same erosion was still evident from Quarter 2 visit. Bunding was present at the Overburden Stockpile Area, where this is present it appears to be effective. The disturbed areas such as bunds appear to be key points for previously detailed weeds to occur.

### 3.2 ACTIVE PIT AREA

Bench condition was interpreted as best as possible from a visual inspection at a safe distance, and via photos (**Plate 4** and **Plate 5**). The drier weather has resulted in vegetation died off and browning. The weeds and undergrowth on the benches appear to be mainly affected. Some trees have also been affected. The erosion (minor land slip) was identified along the high wall (above the "white line") access track along the western AP area (**Plate 6**) was still evident and this section has been blocked off from vehicle traffic. From the White line looking across the pit it is evident that some grass has grown and been affected by the weather in former slip area. The Settlement Dam, (**Plate 7** shows Quarter 2 2023) contains a high cover of Lantana, though significantly drier in quarter 3 (**Plate 8** shows September 2023). Some blasting has also occurred in September, and was being prepared for when on site. A site further into the pit nearer the White line is being utilised for a dam and whilst onsite it was discussed that the current dam water will be moved to the new location for quarrying activities to take place.

As previously recorded, along the eastern rehabilitated benches, the upper benches show the highest cover of native species (namely *Eucalyptus spp.*) which are evidence of previous tubestock planting. The lower benches have been allowed to naturally regenerate. These areas typically contain a greater cover of exotic species, such as *Lantana camara* (Lantana) (**Plate 5**). As noted above the weather has affected the bench vegetation.

The electricity easement on the western side of the pit area had been clear/maintained by the relevant authority. This was still in good condition during the September visit. The vegetation between the easement and White line has a number of weed species such as *Lantana camara* (Lantana) and *Solanum mauritianum* (Tobacco Bush) were present throughout the slope.

### 3.3 SETTLEMENT DAM

A walkover of the edge of the Settlement Dam revealed good vegetation coverage along the dam walls and no areas of erosion or unintended water leakage were apparent. Some exotic species, such as *Lantana camara* (Lantana), *Solanum mauritianum* (Tobacco Bush) and *Paspalum sp.* have established themselves along the dam walls. Despite this, there is still good native species coverage, with species such as *Acacia longifolia*, *Acacia maidenii* and *Eucalyptus spp.* being the most common (**Plate 9**). As with the Quarter 2 inspection, the September visit still has evidence of erosion along the bank from the Dam wall towards the road and along the former track from the Overburden Stockpile Area (it can be partially seen in **Plate 9**). This appears to be of a similar level of erosion.

Water quality within the dam appeared to be reasonable, with little signs of eutrophication (algal blooms). Water Dragons were seen utilising the pond and Holcim staff informed that there is a significant population at the dam. Furthermore, native emergent vegetation such as *Typha sp.* and *Bolboschoenus sp.* are evident along the margins of the dam and appear to be in good health.



### 3.4 OTHER NOTES

It was recorded that some of the fencing wire near the offset area was loose. Also some rubbish was present in the front laydown area and some erosion was present near the hardstand area to the front dam.

### 3.5 PHOTO MONITORING

No apparent visual change is discernible compared to previous rounds of monitoring. **Appendix 3** provides a visual comparison.

## 4 CONCLUSION

As previously documented, weed species are the major concern at the Jandra Quarry the weeds include Crofton Weed, Lantana and Wild Tobacco, which are most common on the edges of native vegetation, around the active areas of the quarry. Ongoing treatment of these weeds is recommended mainly to ensure that infestations do not become unmanageable in the future, or act as sources for future re-infestations. However, around the Overburden Stockpile Area, these infestations are serving to stabilise soil and slow runoff, trapping sediment. Any weed treatment should factor erosion control so as not to cause undue damage.

The upper benches have been revegetated with tubestock and Eucalyptus spp. are now several metres in height, with each bench having areas that have been colonised by exotic grasses, and in some instances Lantana and Wild Tobacco. The lower benches have been left to revegetate naturally due to safety issues and these have higher densities of exotic vegetation. The drier weather has resulted in vegetation died off and browning. Mostly this is the undergrowth, though some trees have been affected. For ideal revegetation some form of weed control or assisted introduction that factors in safety could be explored in the future, in conjunction with the natural revegetation. An ideal time to manage this would be when the next wet spell occurs and some regrowth of undergrowth is noticed. If weeds are controlled at this point, it would be beneficial to ongoing positive rehab.

Besides the landslip on the high wall on the western (“white line”) side, as noted in Quarter 2 2023, the other evidence of erosion was minor predominantly around the Overburden Stockpile Area. The erosion controls in place appear to be working to limit erosion. Erosion throughout the quarry area was generally well contained, though continued monitoring and early prevention works if required should occur.

No areas of poor water quality, or dieback of vegetation from surface water runoff, were observed. The Settlement Dam had no coverage of algae and was vegetated with native aquatic vegetation along its margins.

## 5 RECOMMENDATIONS

Recommendations have been developed based on the outcome of the site-based quarterly inspection of the OSA, AP and Settlement Pond areas. The following items are recommended.

- Intensive weed control along areas of high woody weed cover, i.e., north-eastern AP area where there is high cover of Lantana, Lower rehab benches along the eastern side of the AP area and upper benches of the OSA. Monitor for regrowth after dry spell and control early for maximum benefits.
- Weed control should be structured so that methods are appropriate:
  - backpack spraying and hand removal of weeds should be prioritised in areas accessible on foot and which contain a mix of native and exotic species.
  - Quick spray areas of dense woody weed infestations with little native species mix, i.e., the ‘ROM’
  - Drone / aerial weed control prioritised for areas not accessible via foot, i.e., lower benches of the AP area. A fly-over of the intended areas of control should be conducted first to gain a more accurate idea of species composition so as to reduce the risk of non-target damaged.
- Weed control should be conducted systematically to avoid large-scale initial removal of weeds, resulting in open areas of bare soil, leading to erosion.
- High-threat woody weeds should be prioritised for control before non-woody and annual weeds. Weeds such as Lantana and Tobacco Bush are a high priority.
- Intensive weed control targeting exotic grasses is not recommended, as exotic grasses are currently helping stabilise the benches. This approach should be staged over time and should be supported by additional native species plantings.
- Mature tree and shrub planting along the benches of the OSA. The outer benches of the OSA would benefit from additional planting as the current shrub and tree cover is limited. Furthermore, planting mature trees and shrubs would contribute to shading out some of the exotic grasses.



If you require additional information or clarification, please contact the undersigned at +61 421 555 894.

Sincerely,

**Kleinfelder Australia Pty Ltd**

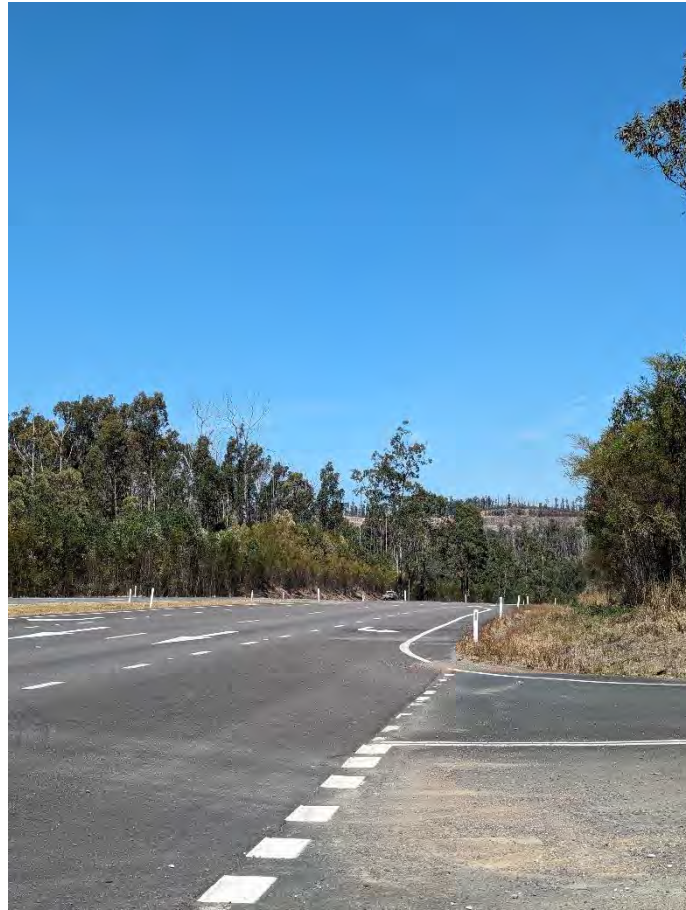
**Jake Brown**

Ecologist



# APPENDIX 1 - SITE PHOTOS





**Plate 1**      **Phot monitoring point at the corner of Blackbutts Road and the Pacific Highway.**



**Plate 2**      **Photo monitoring point from Winmurra Drive.**



**Plate 3** Top of former track from dam near office to Overburden Stockpile Area.



**Plate 4** Rehabilitated benches along the eastern side of the AP area.



**Plate 5**      **Rehabilitated benches along the eastern side of the AP area.**



**Plate 6**      **Under-cut from erosion along the high-wall of the western AP area.**



**Plate 7** Excavated material perched on edge of settlement dam in the AP area near the ROM 2023 (previously noted in 2022 as falling into dam).

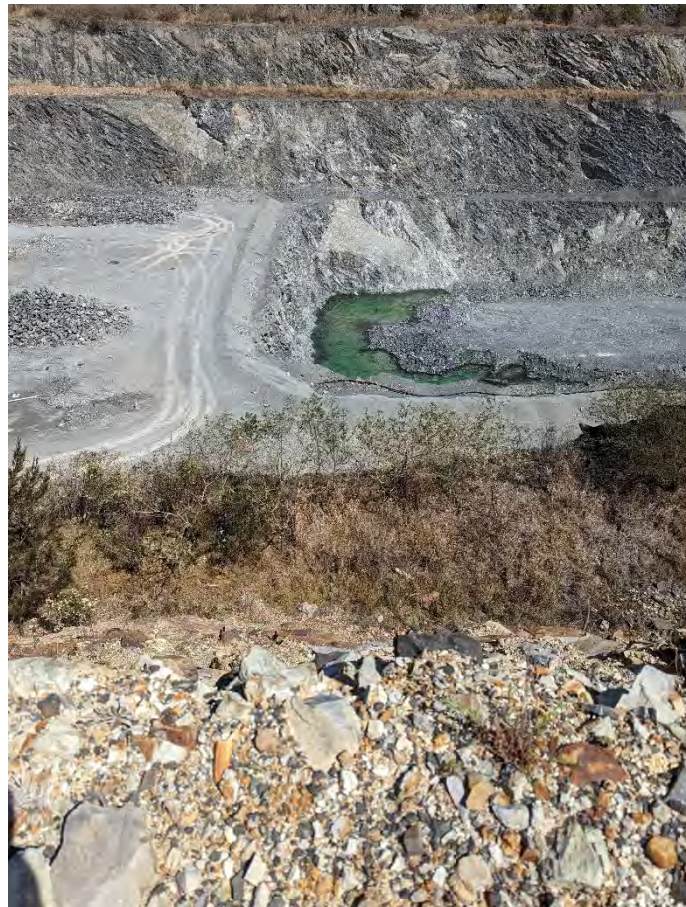


**Plate 8** Dense covering of Lantana along an area of the ROM (north-eastern side of the AP area).





**Plate 9** Native species growth (*Acacia longifolia* and *Eucalyptus* spp.) along the Settlement Dam wall.



**Plate 10** New Dam Location.



## APPENDIX 2 - FIGURE 1 OBSERVATION NOTES

Number	Name	Description
1	Erosion	Drain point
2	Pond	Bit or rubbish small things around pond
3	Rubbish	Small amount of rubbish including baby seat
4	Water dragon	One dam wall
5	Walls	Veg looks dry. Die off of undergrowth evident and some trees.
6	Blasting	Drilling for blasting occurring whilst on site
7	General	Weeds still prevent. No more erosion visible.
8	Track	Vegetation more overgrown. Much drier. Grass doing well on track. Weeds not so much.
9	Slip	Landslip has some grass regrowth.
10	Water	Pooling water
11	Easement	Still looks the same
12	Erosion	Maybe a bit worse than last time
13	Dam	Water appears in good condition. Has large population of water dragons.
14	Dam	Little bit of scum on dam
15	Erosion	Fair channel
16	Erosion	Channel of erosion most of the way up
17	Fungi	Orange on log



# APPENDIX 3 – PHOTO COMPARSION FOR MONITORING

Winmurra Drive



June 2021



February 2022



May 2023



September 2023

Blackbutt Road Intersection with Pacific Highway



June 2021



February 2022



May 2023



Septmeber 2023



# Jandra Quarry Quarterly Monitoring, December 2023

15284 Pacific Highway, Possum Brush NSW 2430

20235501

18 December 2023



Suite 3, 240-244 Pacific Highway,  
Charlestown, NSW 2290  
Phone: +61 2 4949 5200



**Kleinfelder Australia Pty Ltd**

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18 December 2023

20235501

Holcim Pty Ltd  
Jandra Quarry  
15284 Pacific Highway  
Possum Brush NSW 2430

**Attention: Holcim Environmental Coordinator**

**Subject:** Jandra Quarry Quarterly Monitoring, December 2023  
15284 Pacific Highway, Possum Brush NSW 2430

## 1 INTRODUCTION

Holcim (Australia) operates the Jandra Quarry, a hard quarry located approximately 18 kilometres south of Taree, New South Wales. The original development proposal for the quarry was granted on March 30, 2000 (DA231-1-99). A modification to the consent (MOD) was granted on March 13, 2015 (DA231-101-99 Mod 5) allowing for an increase in production and transportation of quarry products to maximum limit of 475,000 tonnes per annum.

Kleinfelder have been engaged to conduct monitoring of the Jandra Quarry rehabilitation areas on a quarterly basis, as stipulated in Section 6.1.1 of the Biodiversity Rehabilitation and Management Plan (BRMP) (Umwelt, 2018). Monitoring has previously been undertaken by Umwelt, until 2021. The outcomes of the quarterly monitoring will be included as part of the annual biodiversity monitoring report (Kleinfelder) for Jandra Quarry.

## 2 SCOPE

On 14 December 2023 a Kleinfelder ecologist, Jake Brown, attended Jandra Quarry to conduct a site-based inspection. Survey methodology was conducted in accordance with the BRMP and included an inspection of the rehabilitated areas to assess the following parameters:

- Stability and condition of the soil.
- Drainage and sediment control structures.
- Runoff water quality.
- Germination rates.
- Plant health.
- Natural regeneration, and
- Weed infestations.

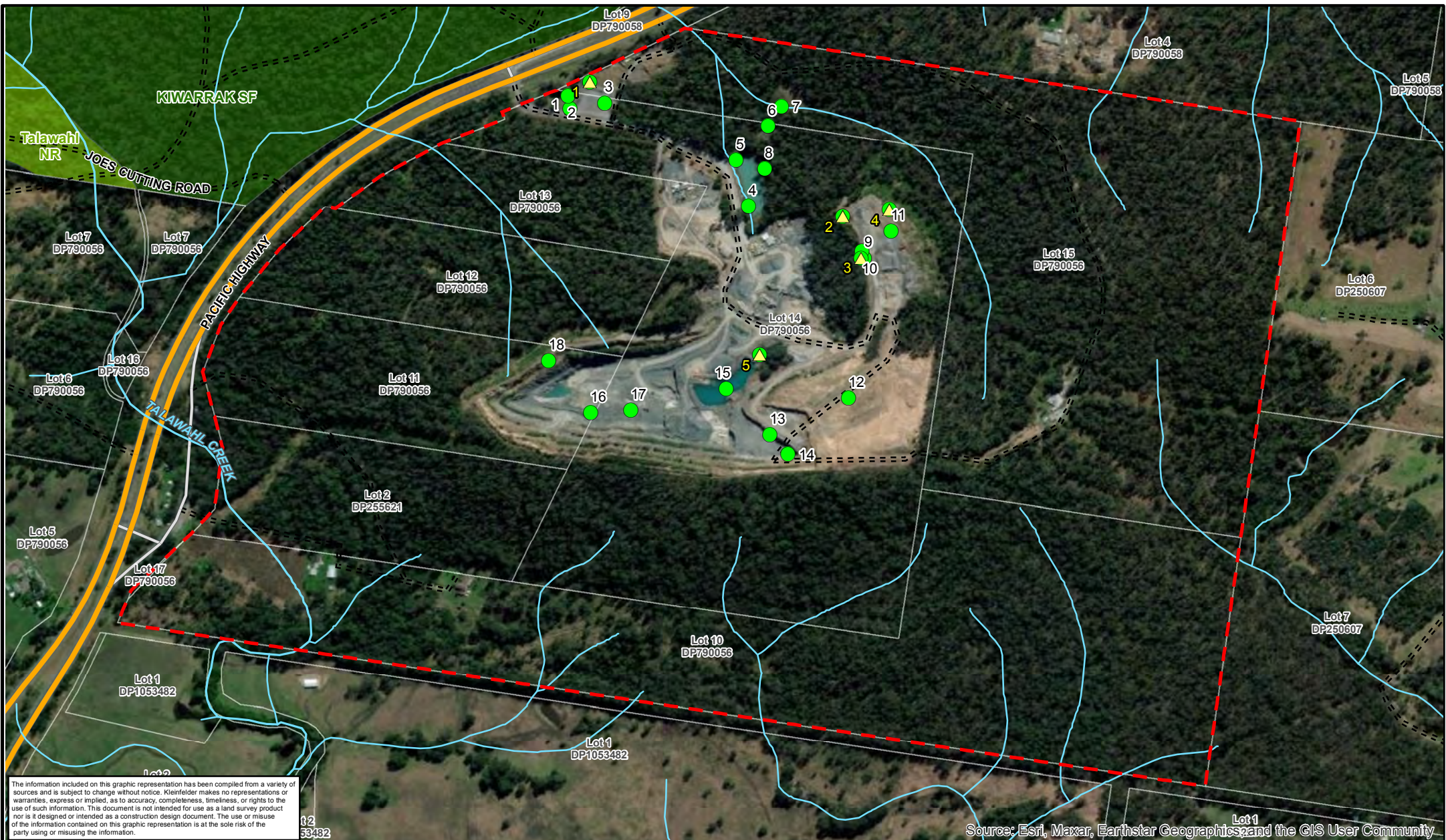
Each rehabilitated area, where accessible, was inspected on foot and observational data collected by a hand-held GPS. Two (2) photo monitoring points, one at the corner of Blackbutts Road and the Pacific Highway and one along Winmurra Drive, were established in 2021. Photos are taken at each location during each monitoring round as a means of visually comparing the aesthetics of the quarry over time (see **Appendix 3** for Selected images).

Due to operational restrictions of the open-pit, the east, south and west benches could not be inspected on foot. Monitoring of these areas was recommended to be conducted via a remote flyover using a drone and camera. Footage can then be analysed to best determine their condition based on the abovementioned parameters.

## 3 RESULTS

Rehabilitated areas adjacent to the Overburden Stockpiling Area (OSA), the Active Pit (AP) and the Settlement Dam near the site office were inspected (**Figure 1**). The observations observed are detailed in **Appendix 2**.





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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

**Legend**

- ▲ Weeds
- Observations
- Jandra Quarry Boundary
- Lot Boundaries
- National Park
- Forestry Corporation of NSW
- Primary Road
- Local Road
- Track

Metres

0 25 50 100 150 200 250

PROJECT REFERENCE: 20235501

DATE DRAWN: 12/18/2023 14:18 Version 1

DRAWN BY: JCBrown

DATA SOURCE:  
NSW Government - 2023  
Esri - 2023  
Holcim - 2023

**Biodiversity Monitoring**

Holcim (Australia)  
Jandra Quarry  
Quarterly Rehabilitation Monitoring

FIGURE:

**1**

### 3.1 OVERBURDEN STOCKPILE AREA

A large amount of revision has occurred in this area with a basin (or similar design) has been created on the northern end of the area. Stockpiled material also appears to have been consolidated in terms of area used as Jandra is an active quarry, depositing overburden material have occurred since the last inspection. Exotic species such as *Setaria sphacelata* (Pigeon Grass), *Melinis repens* (Red Natal Grass), *Tagetes minuta* (Stinking Roger), *Lantana camara* (Lantana), *Solanum mauritianum* (Tobacco Bush), and *Ageratina adenophora* (Crofton Weed) are evident in the OSA. These have been affected by the drier weather. Native species such as *Acacia longifolia* (Coastal Wattle), *Acacia maidenii* (Maiden's Wattle) and some *Eucalyptus spp.* are evident in low abundances but appear to be in a healthy condition. As previously noted from the inspections climber/twining species *Kennedia rubicunda* (Dusky Coral Pea), *Hardenbergia violacea* (Purple Coral Pea) and *Pultenaea villosa* (Hairy Bush-Pea) were also observed. The track running from the overburden stockpile area to western end of the dam near the office was renewed (removal of regrowth from previous disuse) through heavy machinery. A second track had also been renewed to a second dam (northeast of the dam near the office).

During the inspection no active erosion was noticed in this area. However, water was pooling on the track between stockpiles and bund on the western side. Dust suppression across the site was occurring while the survey was undertaken which may account for the water pooling .

### 3.2 ACTIVE PIT AREA

Bench condition was interpreted as best as possible from a visual inspection at a safe distance, and via photos (**Plate 4** and **Plate 5**). As per the September visits, the previous drier weather has resulted in sustained vegetation browning and die-off, predominantly in the undergrowth. However, there was an increase in rainfall between Quarter 3 and Quarter 4 visits, which has promoted the regrowth of the undergrowth vegetation. A minor land slip was identified along the high wall (above the "white line") access track along the western AP area (**Plate 6**) causing this section to be blocked off from vehicle traffic. The end closest to the power line easement (approximately 100 metres) has had substantial regrowth, predominantly grass and weed species that have filled in the track, with minimal soil exposure. The former Settlement Dam in the active pit area, (**Plate 7** shows Quarter 2 2023) contains a high cover of Lantana (**Plate 8** ). A large amount of surface variation has occurred between Quarter 3 and Quarter 4, with the Settlement Dam in the active pit moved to the south and excavation of the former dam occurring. Blasting and excavation work near the benches on the eastern side has also occurred, impacting a very small section of bench vegetation, though this is not considered to be beyond recovery.

As previously recorded, the upper eastern rehabilitated benches show the highest cover of native species (namely *Eucalyptus spp.*) primarily from previous tubestock planting. The lower eastern benches have been allowed to revegetate, naturally. These areas typically contain a greater cover of exotic species, such as *Lantana camara* (Lantana) (**Plate 5**).

The electricity easement on the western side of the pit area had been cleared/maintained by the relevant authority and was still in good condition during this visit. The vegetation between the easement and white line has a number of weed species such as *Lantana camara* (Lantana) and *Solanum mauritianum* (Tobacco Bush) present throughout the slope.

### 3.3 SETTLEMENT DAM

A second dam (northeast of the Settlement Dam) appears to be an additional water source with a pump set up and hose connecting the two dams. The northeast dam looks to be in good condition though recent works have disturbed aquatic vegetation on the edge of the dam, thus, affecting the sedimentation and water quality. In general, the aquatic vegetation appears fine and, though some particles are evident floating in the water. Based on the location in the south-west corner, the vegetation may have been disturbed by the velocity of introduced water.

A walkover of the edge of the Settlement Dam revealed good vegetation coverage along the dam walls and no areas of erosion or unintended water leakage were apparent. Vegetation on the northwest wall / track has grown considerably since the last visit with minimal bare earth present. Some exotic species, such as *Lantana camara* (Lantana), *Solanum mauritianum* (Tobacco Bush), and *Paspalum sp.* have established themselves along the dam walls. Despite the presence of exotic species, there is still good native species coverage, with prevalent species such as *Acacia longifolia*, *Acacia maidenii* and *Eucalyptus spp.* (**Plate 9**). Earlier visits in 2023 noted evidence of



erosion along the bank from the Dam wall towards the road, which now appears stable. Some vegetation such as grasses and weeds have grown along the top of the bank and provide increased stability.

Minimal to no signs of eutrophication (algal blooms) were present. Eastern Water Dragons (*Intellagama lesueurii lesueurii*) were seen utilising the pond and Holcim staff informed that there is a significant population at the dam. Native emergent vegetation such as *Typha sp.* and *Bolboschoenus sp.* are evident along the margins of the dam and appear to be in good health.

### 3.4 OTHER NOTES

There was some rubbish present in the front laydown area and evidence of erosion near the hardstand area to the front dam.

### 3.5 PHOTO MONITORING

No apparent visual change is discernible compared to previous rounds of monitoring. **Appendix 3** provides a visual comparison.

## 4 CONCLUSION

As previously documented, weed species are the major concern at the Jandra Quarry. The weeds include Crofton Weed, Lantana, and Wild Tobacco, which are most common on the edges of native vegetation, around the active areas of the quarry. Ongoing treatment of these weeds is recommended mainly to ensure that infestations do not become unmanageable in the future, or act as sources for future re-infestations. However, around the Overburden Stockpile Area, these infestations are serving to stabilise soil and slow runoff, trapping sediment. Any weed treatment should factor erosion control so as not to cause stability issues.

The upper benches were previously revegetated with *Eucalyptus* spp. tubestock, which are now several metres in height. Under the *Eucalyptus* spp. canopy, the undergrowth areas were colonised by exotic grasses, and, in some instances, Lantana and Wild Tobacco. The lower benches were left to revegetate naturally due to stability issues although comprise of dense exotic vegetation. The drier weather has resulted in undergrowth vegetation browning and die off, though some trees have been affected. For ideal revegetation, weed control is vital, in conjunction with natural revegetation and assisted plantation, that factors in soil stability and safety. An ideal time to manage this would be when the next rain event occurs, and some regrowth is noticed.

There was evidence of a minor landslip around the Overburden Stockpile Area, in conjunction to the landslip on the high wall on the western ("white line") side, as noted in Quarter 2 2023. Erosion throughout the quarry area was generally well contained, though continued monitoring and early prevention works if required should occur.

No areas of poor water quality, or dieback of vegetation from surface water runoff, were observed. The Settlement Dam had no coverage of algae and was vegetated with native aquatic vegetation along its banks.

## 5 RECOMMENDATIONS

Recommendations have been developed based on the outcome of the site-based quarterly inspection of the OSA, AP and Settlement Pond areas. The following items are recommended.

- Intensive weed control along areas of high woody weed cover, i.e., north-eastern AP area where there is high cover of Lantana, Lower rehab benches along the eastern side of the AP area and upper benches of the OSA. Monitor for regrowth after dry spell and control early for maximum benefits.
- Weed control should be structured so that methods are appropriate:
  - backpack spraying and hand removal of weeds should be prioritised in areas accessible on foot and which contain a mix of native and exotic species.
  - Quick spray areas of dense woody weed infestations with little native species mix, i.e., the 'ROM'
  - Drone / aerial weed control prioritised for areas not accessible via foot, i.e., lower benches of the AP area. A fly-over of the intended areas of control should be conducted first to gain a more accurate idea of species composition to reduce the risk of non-target damaged.
- Weed control should be conducted systematically to avoid large-scale initial removal of weeds, resulting in open areas of bare soil, leading to erosion.
- High-threat woody weeds should be prioritised for control before non-woody and annual weeds. Weeds such as Lantana and Tobacco Bush are a high priority.



- Intensive weed control targeting exotic grasses is not recommended, as exotic grasses are currently helping stabilise the benches. This approach should be staged over time and should be supported by additional native species plantings.
- Mature tree and shrub planting along the benches of the OSA. The outer benches of the OSA would benefit from additional planting as the current shrub and tree cover is limited. Furthermore, planting mature trees and shrubs would contribute to shading out some of the exotic grasses.
- Monitoring condition of dams for algal blooms and deteriorating conditions. Treat appropriately to resolve any issues that occur.

If you require additional information or clarification, please contact the undersigned at +61 421 555 894.

Sincerely,

**Kleinfelder Australia Pty Ltd**

**Jake Brown**

Ecologist



# APPENDIX 1 - SITE PHOTOS





**Plate 1** Photo monitoring point at the corner of Blackbutts Road and the Pacific Highway.



**Plate 2** Photo monitoring point from Winmurra Drive.



**Plate 3** Renewed office to Overburden Stockpile Area Track.



**Plate 4** Rehabilitated benches along the eastern side of the AP area.



**Plate 5**      **Rehabilitated benches along the eastern side of the AP area.**



**Plate 6**      **Vegetation regrowth along the high-wall track of the western AP area.**





**Plate 7**      **New settlement dam in the AP area.**



**Plate 8**      **Dense covering of Lantana along an area of the ROM (north-eastern side of the AP area).**



**Plate 9** Dam near office with high sediment water running in.



**Plate 10** Access track to lower Dam Location.



## APPENDIX 2 - FIGURE 1 NOTES

Number	Observation Description
1	Erosion channel / drain
2	Little bit of rubbish
3	Water dragon
4	Water looks a bit dirty.
5	Veg has regrown a lot
6	Tracked cleared or reworked for dam access
7	Dam looks good
8	Track has been repaired
9	Collecting water from runoff
10	Drainage channel in bund
11	Grass and veg grown a lot since last visit
12	Wild tobacco on slope, single plant
13	Trees look good on benches. Grass, understory dry/dying off.
14	Bench veg minor impact
15	Dam empty and being excavated
16	New dam in use
17	Excavated deeper
18	Veg on track grown a lot since last visit. Grass mainly on track. Off to side lantana, wild tobacco

Number	Weed Description
1	Wild tobacco
2	Lantana either side of top of track
3	Lantana still present
4	Lantana and wild tobacco
5	Still Lantana infested



# APPENDIX 3 – PHOTO COMPARSION FOR MONITORING

Winmurra Drive



June 2021



February 2022



May 2023



September 2023



December 2023

**Blackbutt Road Intersection with Pacific Highway**



June 2021



February 2022



May 2023



Septmeber 2023



December 2023





**Appendix 4**

**ANNUAL BIODIVERSITY AND  
REHABILITATION MONITORING  
REPORT**

# Jandra Quarry Annual Biodiversity and Rehabilitation Monitoring

15284 Pacific Hwy, Possum Brush, NSW 2430

20235501

11 December 2023



Suite 3, 240-244 Pacific Highway,  
Charlestown, NSW 2290  
Phone: +61 2 4949 5200



# Jandra Quarry Annual Biodiversity and Rehabilitation Monitoring

15284 Pacific Hwy, Possum Brush, NSW 2430

Kleinfelder Project: 20235501

Kleinfelder Document: 20235501

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ABN: 23 146 082 500

## Document Control:

Version	Description	Date
1.0	Draft	11 December 2023
Prepared	Reviewed	Endorsed
Jake Brown	Cassandra Bugir	Rob Townsend

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Appendix A: Bioersivity Offset Area Floristic Plot Data
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# EXECUTIVE SUMMARY

Holcim (Australia) operates the Jandra Quarry, a hard quarry located approximately 18 kilometres south of Taree, New South Wales. The original development proposal for the quarry was granted on March 30, 2000 (DA231-1-99). A modification to the consent (MOD) was granted on March 13, 2015 (DA231-101-99 Mod 5) allowing for an increase in production and transportation of quarry products to maximum limit of 475,000 tonnes per annum.

A Biodiversity and Rehabilitation Plan (BRMP) was completed by Umwelt Pty Ltd in 2018 in accordance with Condition 25 of Schedule 3 of the MOD in consultation with the NSW Office of Environment and Heritage (OEH). The BRMP outlines the requirements for monitoring for the Jandra Quarry as outlined in Section 6.0 including:

- *The Biodiversity Offsets Area (BOA) (Section 3.3).*

This report details the findings of the monitoring conducted by Kleinfelder Australia on the 23<sup>rd</sup> and 24<sup>th</sup> of March 2023.

The survey methodology was conducted in accordance with the BRMP. Flora monitoring was conducted in the Biodiversity Offsets Area where two permanent flora monitoring quadrats are established using Biodiversity Assessment Methodology (BAM). No formal fauna monitoring was required for 2023, however opportunistic surveys of the BOA were also conducted while moving between quadrats and transects. A Carpet Python (*Morelia spilota*) was located during fieldwork near Plot 1.

A walkover style survey of the Buffer Areas was also conducted assessing weed infestations, feral animal presence and illegal access and activity.

The BOAs flora monitoring recorded a total of 55 different native species at an average of 36 native species per quadrat. A total of 11 different weed species were recorded including three “high threat” species. Woody weeds were recorded in both quadrats and scattered throughout the BOAs, but not in high density at this stage. The effects of the 2018/19 fires were visible with epicormic growth on Eucalyptus trees widespread. Seedlings and saplings of canopy, midstorey, and shrubs were observed through the BOA and the Buffer Areas indicating good recovery and resilience the fires.

The Buffer Areas recorded some woody weeds that were scattered but not dense in nature at this stage.

Recommendations made included treatment of the woody weeds in the BOA and Buffer Areas to prevent increased infestations. There were no recommendations for revegetation or feral fauna control in the BOA.



# 1 INTRODUCTION

## 1.1 PROJECT DESCRIPTION

Holcim (Australia) operates the Jandra Quarry, a hard quarry located approximately 18 kilometres south of Taree, New South Wales (**Figure 1.1**). The original development proposal for the quarry was granted on March 30, 2000 (DA231-1-99). A modification to the consent (MOD) was granted on March 13, 2015 (DA231-101-99 Mod 5) allowing for an increase in production and transportation of quarry products to maximum limit of 475,000 tonnes per annum. The site experienced a severe bushfire event in 2018 that impacted biodiversity values.

## 1.2 SCOPE AND PURPOSE

A Biodiversity and Rehabilitation Plan (BRMP) was completed by Umwelt Pty Ltd in 2018 in accordance with Condition 25 of Schedule 3 of the MOD in consultation with the NSW Office of Environment and Heritage (OEH). The BRMP outlines the requirements for monitoring for the Jandra Quarry as outlined in Section 6.0 of the BRMP including:

- The Biodiversity Offsets Area (BOA)

This report details the flora monitoring conducted by two Kleinfelder Australia ecologists, on the 23rd<sup>th</sup> and 24<sup>th</sup> of March 2023, and Nest Box monitoring performed in September 2023.

As per the BRMP the Annual Biodiversity Offset Monitoring Report will include:

- methods and results of monitoring program (Section 2)
- records of the management actions undertaken in the BOA, including minor alterations that are part of adaptive management (Section 2.3)
- a record of events that have had an impact on the site's biodiversity values (Section 1)
- any problems experienced and the recommendations proposed or the actions taken to address them (Section 4)
- commentary on results and trends towards performance indicators (Section 3)

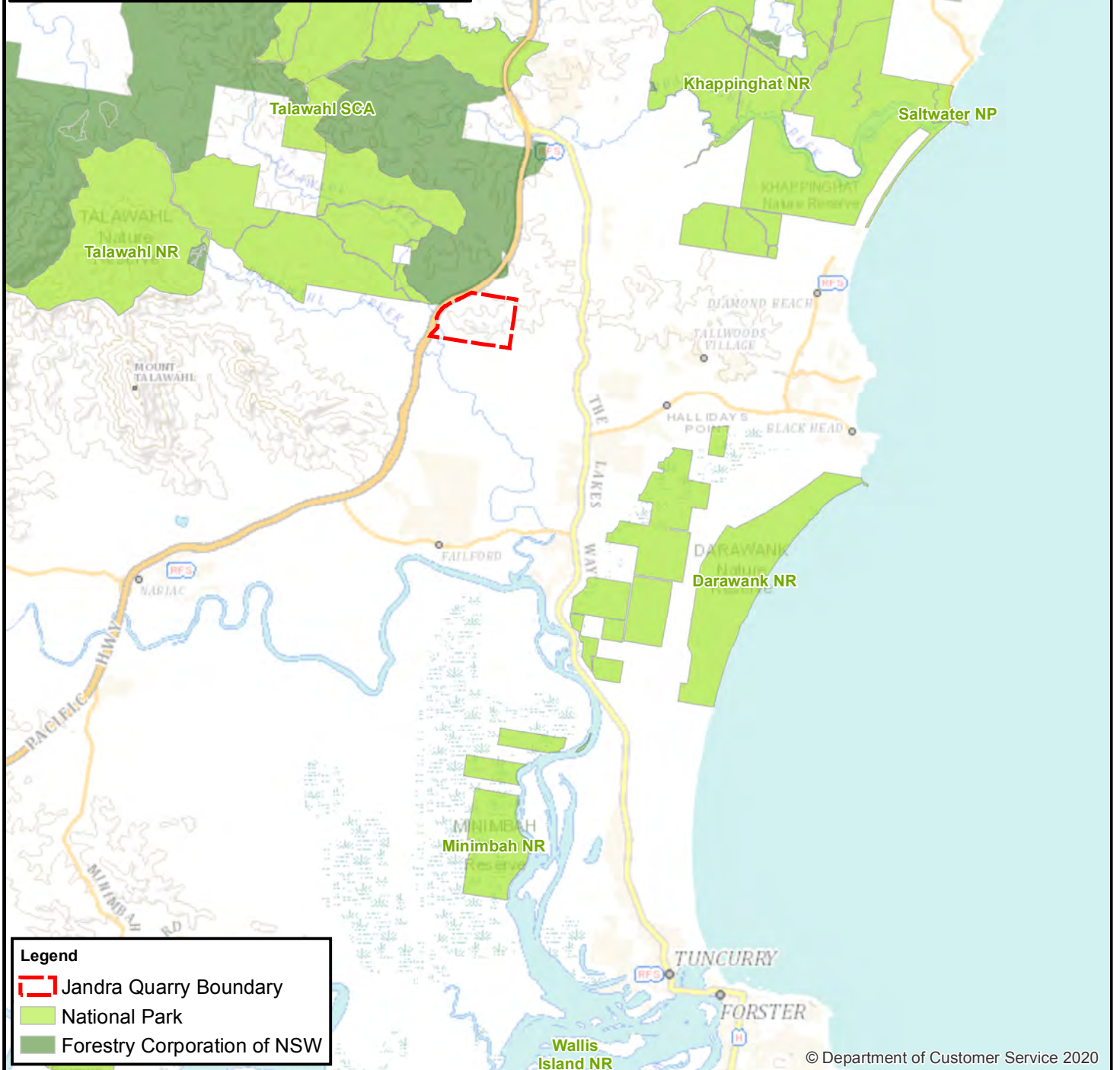
**Regional Context**

0 5 10 20 30 40 50 km



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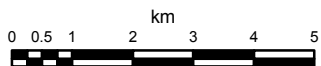
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**Legend**

- Jandra Quarry Boundary
- National Park
- Forestry Corporation of NSW

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PROJECT REFERENCE: 20235501

DATE DRAWN: 7/28/2023 13:28 Version 1

DRAWN BY: JCBrown

DATA SOURCE:  
NSW Government - 2023  
Holcim - 2023

**Locality**

FIGURE:

**1**

Holcim (Australia)  
Jandra Quarry Biodiversity Offsets Area  
Annual Biodiversity and Rehabilitation Monitoring



## 2 METHODS

### 2.1 BIODIVERSITY OFFSETS AREA

The BOA methodology stipulated the establishment of flora quadrats and fauna transects (**Figure 2**).

#### 2.1.1 Flora Monitoring

Two permanent flora quadrats were established within the BOA with monitoring to occur every two years. Species diversity and structural composition were sampled using floristic and vegetation integrity assessments in accordance with the Biodiversity Assessment Methodology (BAM), including photo monitoring to provide a visual assessment of vegetation changes over time.

In addition to the above data collection, surveys also record the following:

- General vegetation health.
- Evidence of natural regeneration.
- Occurrence and abundance of weeds.
- Presence of threatened or other significant species.
- Signs of disturbance by stock, feral animals, or humans, and,
- Any observable impacts of the quarry, such as the effectiveness of fencing and weed control efforts.

#### 2.1.2 Fauna Monitoring

Fauna monitoring is to be conducted in the first year of the project and then every three years after that utilising several techniques. No fauna monitoring was required for 2023.

Two fauna transects will be established in the BOA and at each of the transects the following will be conducted:

- Spotlight surveys – 1 hour each fauna transect.
- Diurnal bird survey – 2 x 20-minute surveys for each site per day. Eight surveys in total.
- Diurnal herpetological survey – 1.5 hours per transect.
- Nocturnal herpetological surveys 1 hour each transect.
- Anabat surveys – 2 x Anabats for 2 nights.
- Remote camera surveys targeting ground and arboreal fauna – 8 cameras in total, 2 ground, and 2 arboreal per transect for 2 nights.

Opportunistic surveys during walkovers of the BOA including identification of any feral animal species (A Carpet Snake (*Morelia spilota*) was located during fieldwork near Plot 1 as part of the flora plot recording.)

### 2.2 JANDRA QUARRY BUFFER AREAS

As an additional action, in addition to the above mandated monitoring, Kleinfelder was commissioned to conduct a walkover survey of the buffer areas assessing weed infestations, disturbance by human activity including illegal access and rubbish dumping, and signs or presence of feral animals.

### 2.3 NEST BOX MONITORING

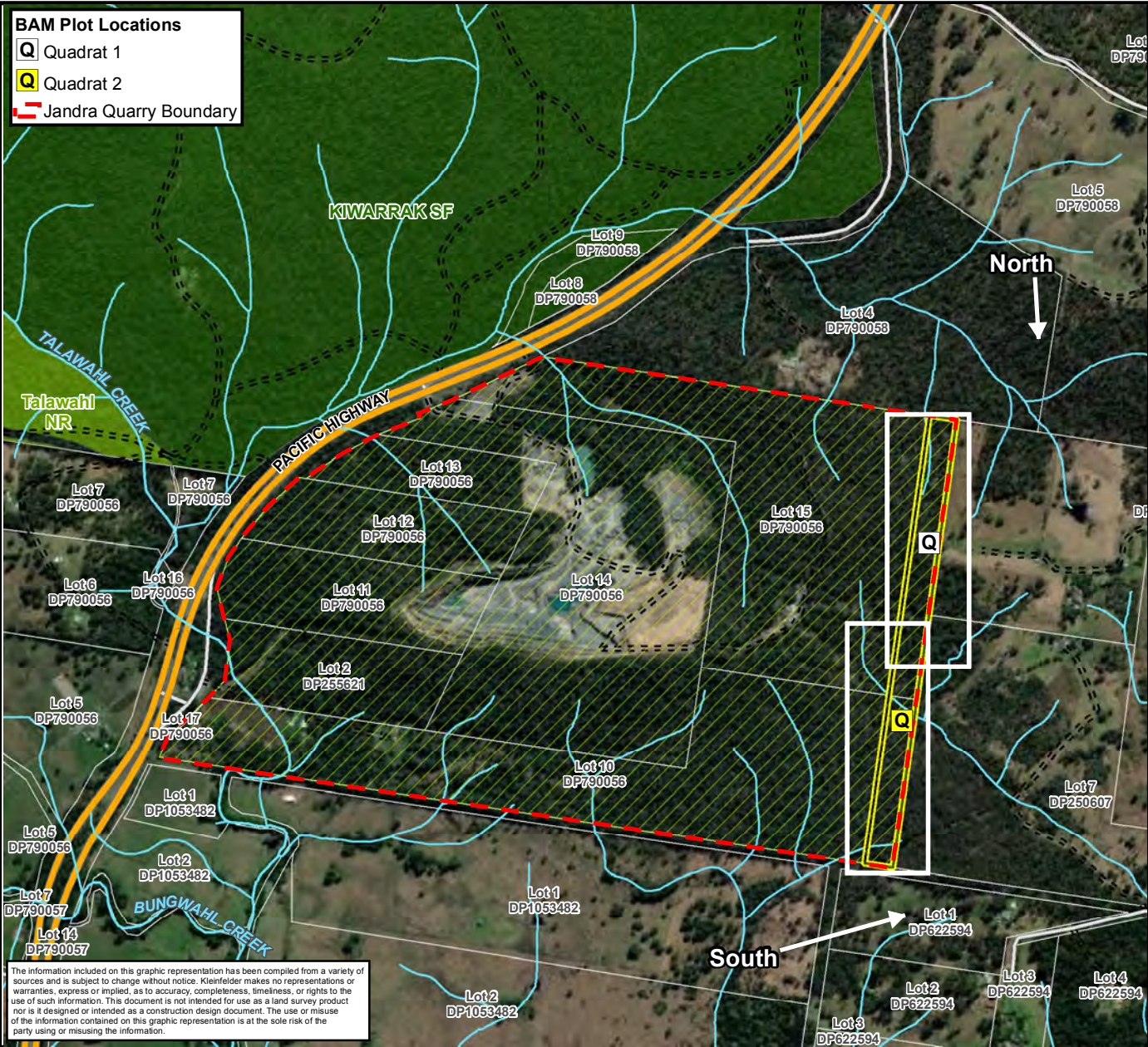
As per the management plan the Nest box monitoring will be undertaken annually for five years after the first phase of nest box installation to record the effectiveness of artificial habitat structures. This monitoring will report on the degree of use of nest boxes and make recommendations regarding maintenance activities as required. The need for this monitoring program to continue will be assessed at this time. Monitoring will be undertaken during spring each year when the use of boxes by bird species can be detected. While mammal species will den in the nest boxes all year, bird species such as parrots using the boxes solely for breeding will only be present for 8 to 12 weeks during spring.

Nest boxes will be checked using a camera and extension pole via lid or main entrance depending on box design.

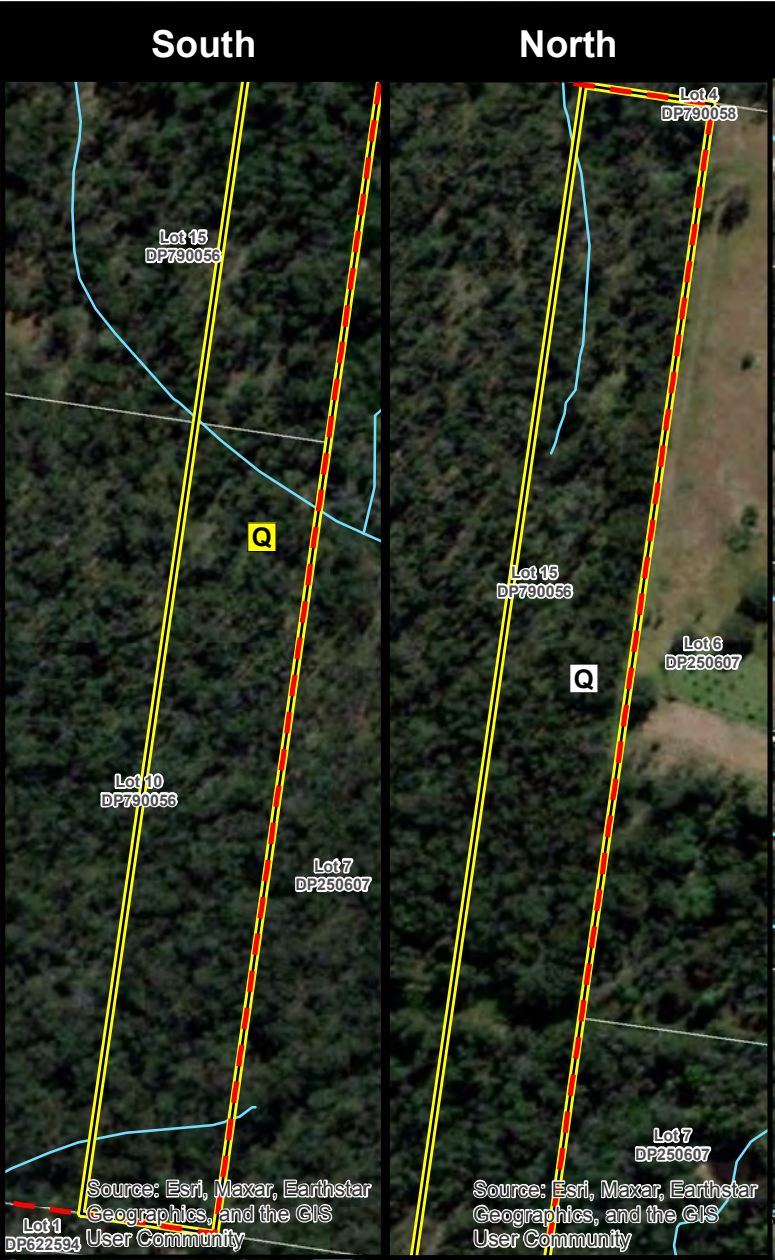


**BAM Plot Locations**

- Q Quadrat 1
- Q Quadrat 2
- Jandra Quarry Boundary



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Legend	
<span style="border-bottom: 2px dashed red; width: 20px; display: inline-block;"></span>	Jandra Quarry Boundary
<span style="border: 2px solid yellow; width: 20px; height: 10px; display: inline-block;"></span>	Annual Monitoring Walkover
<span style="border: 2px solid yellow; width: 20px; height: 10px; display: inline-block;"></span>	Biodiversity Offsets Area Boundary
<span style="background-color: #90EE90; width: 20px; height: 10px; display: inline-block;"></span>	National Park
<span style="border: 1px solid black; width: 20px; height: 10px; display: inline-block;"></span>	Lot Boundaries
<span style="background-color: #6AA84F; width: 20px; height: 10px; display: inline-block;"></span>	Forestry Corporation of NSW
<span style="border-bottom: 2px solid orange; width: 20px; display: inline-block;"></span>	Primary Road
<span style="border-bottom: 2px solid yellow; width: 20px; display: inline-block;"></span>	Arterial Road
<span style="border-bottom: 2px solid grey; width: 20px; display: inline-block;"></span>	Local Road
<span style="border-bottom: 2px dashed black; width: 20px; display: inline-block;"></span>	Track
<span style="border-bottom: 2px solid blue; width: 20px; display: inline-block;"></span>	Named Watercourse
<span style="border-bottom: 2px solid lightblue; width: 20px; display: inline-block;"></span>	Unnamed Watercourse

Metres  
0 50 100 200 300 400 500

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PROJECT REFERENCE: 20235501  
DATE DRAWN: 7/28/2023 13:32 Version 1  
DRAWN BY: JCBrown  
DATA SOURCE:  
NSW Government - 2023  
Esri - 2023  
Holcim - 2023

**Annual Monitoring**

Holcim (Australia)  
Jandra Quarry Biodiversity Offsets Area  
Annual Biodiversity and Rehabilitation Monitoring

FIGURE:  
**2**

# 3 RESULTS

## 3.1 BIODIVERSITY OFFSETS AREA

### 3.1.1 Flora Monitoring

A total of 55 native species were recorded from the across the two vegetation quadrats with an average of 36 native flora species. The northern quadrat (Q1) (**Plate 1**) recorded 31 native species, while the southern quadrat (Q2) (**Plate 2**) recorded 41 native species (**Table 1**). A full species list is provided in **Appendix A**, including estimated numbers and coverage of each quadrat.

**Table 1: Summary of the flora monitoring by stratum of the BOA at Jandra Quarry**

Strata	Northern Quadrat (Q1)	Southern Quadrat (Q2)
Tree (TG)	4	6
Shrub (SG)	5	6
Forb (FG)	7	12
Grass & grasslike (GG)	18	11
Other (OG)	7	4
Fern (EG)	0	1
<b>Total Native</b>	<b>40</b>	<b>45</b>
<b>Total Exotic</b>	<b>9</b>	<b>4</b>
<b>Total Species Richness</b>	<b>40</b>	<b>45</b>

A total of 11 different exotic species were recorded from the monitoring quadrats with Q1 recording 9 exotic species and Q2 only 4 exotic species. Three of these species – *Bidens pilosa* (Cobblers Pegs), *Chloris gayana* (Rhodes Grass) and *Megathyrsus maximus* (Guinea Grass) – are listed as “High Threat” indicating that they have the potential to rapidly colonise areas of disturbance e.g. after fires. Of the remaining weed species, the woody weeds *Phytolacca octandra* (Inkweed) and *Solanum mauritianum* (Wild Tobacco) were recorded in both quadrats and can also pose a threat to revegetating or recovering native communities.



**Plate 1: Quadrat Q1 in the BOA.**



**Plate 2: Quadrat Q2 in the BOA.**

### 3.2 BUFFER AREA WALKOVER

Like the BOA, this area has been heavily affected by the past bushfire. A similar trend to the BOA was evident, where ridge lines and upper slope canopy cover were severely reduced (with some regrowth now evident), and the understorey was prolific and dense. Parts of the southern section of the Buffer Area still had intact canopy cover. Some large hollow-bearing trees were observed to be unaffected by the fire. Many dead trees were present from the fire. The midstorey containing *Allocasuarina sp.* was largely affected over majority of the Buffer Area. The northern portion of the Buffer Area typically follows a ridgeline and the vegetation was greatly affected by the recent bushfire as evidenced by the epicormic growth on *Eucalyptus* trees throughout most of this area. In areas of dense ground cover the dominant species were *Entolasia stricta*, *Kennedia rubicunda* and *Oplismenus sp.* Some areas on the southern section of the buffer area still had intact midstorey layer with *Allocasuarina littoralis* and *A. torulosa* present. Good regeneration of *Eucalyptus*, *Allocasuarina* and *Acacia* species were observed throughout.

Weed species were much the same as those encountered in the BOA, with Inkweed, Tobacco bush and Fleabane generally the most abundant. Still, the cover of these species was usually sparse (1-5%) and negligible (<1%) throughout the area, with isolated patches at higher concentrations. A higher cover of weed species were present along old vehicle tracks, powerline easements and around old dwellings. *Lantana camara* was encountered within the Buffer Area, but generally in very low concentrations.

### 3.3 NEST BOXES

The existing nest boxes and the eight new nest boxes installed in August 2022 were checked on the 26 September 2023. Of the nest boxes, two of the older boxes were occupied by Brushtail Possums (*Trichosurus vulpecula*). One of the old nest boxes (Number 1) has fallen off the tree and is resting intact on the ground. Old nest box Number 3 was unable to be located. Results are listed below in **Table 2** and **Figure 3**.

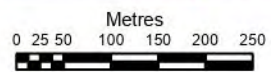
**Table 2: Nest Box Inspection Results**

Box ID	Result	Longitude	Latitude
Old Number 1	Fallen from tree – on ground still intact. Not occupied.	152.4646235	-32.04777824
Old Number 2	Brushtail possum ( <i>Trichosurus vulpecula</i> )	152.464639	-32.04738586
Old Number 3	Unable to be located	-	-
Old Number 4	Not occupied	152.4645639	-32.04697708
Old Number 5	Brushtail possum ( <i>Trichosurus vulpecula</i> )	152.4645398	-32.04674159
New Number 1	Not occupied	152.4644223	-32.04830722
New Number 2	Not occupied	152.4643657	-32.04867722
New Number 3	Not occupied	152.464299	-32.04896389
New Number 4	Not occupied	152.4643807	-32.04935222
New Number 5	Not occupied	152.464474	-32.04811556
New Number 6	Not occupied	152.464509	-32.04777556
New Number 7	Not occupied	152.464639	-32.04758722
New Number 8	Not occupied	152.4648173	-32.04708055



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- Legend**
- New Nest Boxes
  - Old Nest Boxes
  - Occupied Nest Box
  - Jandra Quarry Boundary
  - Lot Boundaries
  - National Park
  - Forestry Corporation of NSW
  - Primary Road
  - Local Road
  - Track



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DATA SOURCE:  
 NSW Government - 2023  
 Esri - 2023  
 Holcim - 2023

**Biodiversity Monitoring**

Holcim (Australia)  
 Jandra Quarry  
 Annual Biodiversity and Rehabilitation Monitoring

FIGURE:

**3**

## 4 DISCUSSION AND RECOMMENDATIONS

### **Biodiversity Offsets and Buffer Zone Areas**

Fire has affected the vegetation in the BOA and in the Buffer Area at the Jandra Quarry, especially along ridgelines. The vegetation is however displaying good resilience and recovering with early pioneering species that respond to disturbance currently dominating the ground and shrub layers – *Kennedia rubicunda* has responded to the fire. Natural regeneration was observed throughout the BOA and buffer areas, with seedlings of canopy, midstorey, and shrub species observed. Weeds were present, but not dense at this stage and targeted weed control efforts would prevent them from becoming an issue. Apart from weed control as outlined below there are no recommendations made for the vegetation in the BOA and Buffer Areas.

Weed control of the woody weeds in the BOA, Buffer Areas and Rehabilitated benches should be undertaken by suitably qualified and experienced contractors. For the BOA and Buffer Areas, a walkover or sweep by land management technicians with back-pack sprayers and hand tools to control the Inkweed, Lantana, and Wild Tobacco plants could be conducted biannually or annually. This is very straightforward and can be commenced at any time, although control works before spring and the next seeding event would be advantageous. More detailed weed mapping in the BOA and Buffer Zone areas would be advantageous in determining the extent and density of these weeds, though quarterly monitoring has noted weeds across portions of the site.

### **Nest Boxes**

The BRMP recommends that nest boxes be checked for the first five years from initial installation phase. It is recommended that the eight new boxes installed in 2022 are monitored for the first five years, then as per the management plan, reassess the monitoring program, as required. Additionally, maintenance should be performed on the nestboxes, such as Old Nest Box Number 1 which has fallen from the tree and should be reattached for continued function. Inspections are required for maintenance / general condition, and could be associated with monitoring going forward.

## 5 REFERENCES

Umwelt (2018) *Jandra Quarry Biodiversity and Rehabilitation Management Plan*. Report prepared for Holcim (Australia) by Umwelt Pty Ltd.

# APPENDIX A: BIODIVERSITY OFFSET AREA FLORISTIC PLOT DATA

Family	Scientific Name	Plot ID	Q1		Q2	
		BAM Growth Form / High Threat Weeds	C (foliage cover) (%)	Ab (abundance rating)	C (foliage cover) (%)	Ab (abundance rating)
Acanthaceae	<i>Brunoniella australis</i>	Forb (FG)			0.1	2
Apiaceae	<i>Centella asiatica</i>	Other (OG)			0.1	5
Apiaceae	<i>Hydrocotyle laxiflora</i>	Forb (FG)			0.3	100
Apocynaceae	<i>Gomphocarpus fruticosus</i>	Exotic	0.1	2		
Asparagaceae	<i>Eustrephus latifolia</i>	Other (OG)	0.1	15		
Asteraceae	<i>Bidens pilosa</i>	High Threat			0.1	1
Asteraceae	<i>Conyza canadensis</i>	Exotic	0.1	1		
Asteraceae	<i>Conyza bonariensis</i>	Exotic			0.1	3
Asteraceae	<i>Vernonia cinerea</i>	Forb (FG)			0.2	15
Asteraceae	<i>Sigesbeckia orientalis subsp. orientalis</i>	Forb (FG)	4	75		
Asteraceae	<i>Euchiton sphaericus</i>	Forb (FG)			0.1	1
Bignoniaceae	<i>Pandorea pandorana</i>	Other (OG)	0.5	20	0.1	3
Cannabaceae	<i>Trema tomentosa</i>	Shrub (SG)	0.1	1		
Casuarinaceae	<i>Allocasuarina torulosa</i>	Tree (TG)	3	4	1.5	75
Convolvulaceae	<i>Dichondra repens</i>	Forb (FG)	0.1	1000	0.5	150
Cyperaceae	<i>Lepidosperma laterale</i>	Grass & grasslike (GG)			0.5	10
Cyperaceae	<i>Fimbristylis dichotoma</i>	Grass & grasslike (GG)			5	100
Cyperaceae	<i>Cyperus sanguinolentus</i>	Grass & grasslike (GG)	2	200		
Dennstaedtiaceae	<i>Pteridium esculentum</i>	Fern (EG)			0.1	1
Dilleniaceae	<i>Hibbertia scandens</i>	Other (OG)			0.1	1
Fabaceae	<i>Senna occidentalis</i>	Ecotic	0.1	1		
Fabaceae (Faboideae)	<i>Daviesia ulicifolia</i>	Shrub (SG)			0.5	20
Fabaceae (Faboideae)	<i>Kennedia rubicunda</i>	Other (OG)	5	50	0.2	20
Fabaceae (Faboideae)	<i>Hardenbergia violacea</i>	Other (OG)	1	50		



Family	Scientific Name	Plot ID	Q1		Q2	
		BAM Growth Form / High Threat Weeds	C (foliage cover) (%)	Ab (abundance rating)	C (foliage cover) (%)	Ab (abundance rating)
Fabaceae (Faboideae)	<i>Glycine tabacina</i>	Other (OG)			3	750
Fabaceae (Faboideae)	<i>Glycine microphylla</i>	Other (OG)	5	200		
Fabaceae (Faboideae)	<i>Desmodium gunnii</i>	Forb (FG)			0.1	20
Fabaceae (Mimosoideae)	<i>Acacia maidenii</i>	Tree (TG)	0.5	4	0.1	2
Fabaceae (Mimosoideae)	<i>Acacia falcata</i>	Shrub (SG)	0.1	2	0.5	6
Goodeniaceae	<i>Goodenia heterophylla</i>	Forb (FG)			0.5	50
Lamiaceae	<i>Plectranthus parviflorus</i>	Forb (FG)	1	40	0.5	25
Lobeliaceae	<i>Pratia purpurascens</i>	Forb (FG)	0.5	100	1	100
Lomandraceae	<i>Lomandra longifolia</i>	Grass & grasslike (GG)			30	300
Myrtaceae	<i>Eucalyptus siderophloia</i>	Tree (TG)	3	2	1	3
Myrtaceae	<i>Eucalyptus propinqua</i>	Tree (TG)			5	2
Myrtaceae	<i>Corymbia maculata</i>	Tree (TG)	5	4	10	7
Myrtaceae	<i>Melaleuca linarifolia</i>	Shrub (SG)	0.1	1	0.2	30
Myrtaceae	<i>Callistemon salignus</i>	Shrub (SG)			0.5	10
Other	<i>Geranium gardneri</i>	Other (OG)	5	500		
Phormiaceae	<i>Dianella caerulea</i>	Forb (FG)	0.1	4	0.1	10
Phyllanthaceae	<i>Glochidial ferdinandi</i>	Tree (TG)			0.2	3
Phyllanthaceae	<i>Breynia oblongifolia</i>	Shrub (SG)			0.1	5
Phytolaccaceae	<i>Phytolacca octandra</i>	Exotic	1	10	0.1	3
Poaceae	<i>Megathyrsus maximus</i>	High Threat	0.1	2		
Poaceae	<i>Chloris gayana</i>	High Threat	0.1	5		
Poaceae	<i>Setaria parviflora</i>	Exotic	0.1	3		
Poaceae	<i>Themeda triandra</i>	Grass & grasslike (GG)			1	25
Poaceae	<i>Panicum simile</i>	Grass & grasslike (GG)	2	200	25	2000
Poaceae	<i>Oplismenus imbecillis</i>	Grass & grasslike (GG)	10	5000		

Family	Scientific Name	Plot ID	Q1		Q2	
		BAM Growth Form / High Threat Weeds	C (foliage cover) (%)	Ab (abundance rating)	C (foliage cover) (%)	Ab (abundance rating)
Poaceae	<i>Opismenus aemulus</i>	Grass & grasslike (GG)	25	10000	1	75
Poaceae	<i>Microlaena stipoides</i>	Grass & grasslike (GG)	10	1000	2	200
Poaceae	<i>Imperata cylindrica</i>	Grass & grasslike (GG)	2	100	2	500
Poaceae	<i>Entolasia marginata</i>	Grass & grasslike (GG)			0.5	200
Poaceae	<i>Entolasia stricta</i>	Grass & grasslike (GG)	15	4000	25	5000
Poaceae	<i>Echinopogon caespitosus</i>	Grass & grasslike (GG)			0.5	50
Poaceae	<i>Digitaria parviflora</i>	Grass & grasslike (GG)	1	100		
Proteaceae	<i>Persoonia linearis</i>	Shrub (SG)			0.1	5
Proteaceae	<i>Lambertia fermosa</i>	Shrub (SG)	0.1	6		
Rosaceae	<i>Rubus parvifolius</i>	Shrub (SG)	0.1	20		
Rubiaceae	<i>Opercularia diphylla</i>	Forb (FG)			0.1	10
Solanaceae	<i>Solanum nigrum</i>	Exotic	0.1	2		
Solanaceae	<i>Solanum mauritianum</i>	Exotic	1	20	0.1	2
Solanaceae	<i>Solanum prinophyllum</i>	Forb (FG)	0.2	10		
Stackhousiaceae	<i>Stackhousia viminea</i>	Forb (FG)			0.5	45
Violaceae	<i>Afrohybanthus stellarioides</i>	Forb (FG)	0.2	40		
Vitaceae	<i>Cayratia clematidea</i>	Other (OG)	1	2		
<b>Total Native species</b>			40		45	
<b>Total Exotic species</b>			31		41	
<b>Total Species Richness</b>			9		4	

**Appendix 5**  
**INDEPENDENT ENVIRONMENTAL**  
**AUDIT**

**RESPONSE ACTION PLAN**

Reference	Approval or licence requirement	Audit Finding	Compliance status	Action Reference	Holcim Response / Action Plan	Holcim Response / Action Plan Timeframe
18	The Applicant shall provide annual quarry production data to DRE using the standard form for that purpose; and report these data in the Annual Review (see condition 4 of Schedule 5).	Evidence of this submission to DRE was unable to be supplied during the audit process. Production data is available in the Annual Reviews.	Not-compliant		The standard online form was completed. Moving forwards a screenshot of the submission will be kept for records.	N/A
1	The Applicant shall ensure that the noise generated by the development does not exceed the criteria in Table 2 or Table 3 at any residence on privately-owned land.	Noise at the site was generally compliant across all locations during the reporting period. One exceedance was recorded at R2 in March 2021, with <39 dB recorded at a location with a limit of 36dB. This exceedance was due to a bulldozer conducting overburden maintenance as required every two years; the bulldozer was immediately relocated to a lower level within the pit and Holcim implemented a long-term management measure to ensure overburden maintenance is not conducted within the morning shoulder period, when the exceedance was recorded.	Not-compliant		NBMP to be reviewed and updated as necessary following this Audit as per conditions of consent (within three months of submission).	In Progress
5	The Applicant shall ensure that blasting on site does not cause any exceedance of the criteria in Table 4. However, these criteria do not apply if the Applicant has a written agreement with the relevant owner to exceed the limits in Table 4, and the Applicant has advised the Department in writing of the terms of this agreement.	One blast on 27/01/2022 exceeded the allowable airblast overpressure dB limit of 115. The blast was measured at 119.1 dB at monitoring point R2 (112 Spicers Road). No agreement exists with this receiver and as such this remains a non-compliance.	Not-compliant		NBMP to be reviewed and updated as necessary following this Audit as per conditions of consent (within three months of submission).	In Progress
19	(b) Surface Water Management Plan that includes: - a detailed description of the surface water management system for the development, including the: - clean water diversion system; - erosion and sediment controls; and - the water storages required for each stage of the development; - identification of all reasonable and feasible measures to improve the quality of surface water on the site, particularly those measures required to improve the water quality in the main dam, and a timeframe for the implementation of any identified improvements; - the measures that would be implemented to minimise water use on site; - surface water impact assessment criteria, - a program to monitor surface water quality, and - a plan to respond to any exceedances of the performance criteria, and mitigate any adverse surface water impacts of the development; and - reporting procedures .	The SWMP addresses site surface water management, including diversions, ESC measures and water storage. It also identifies a number of measures to improve water quality, reduce water use and minimum discharge criteria and monitoring frequency. However, as outlined in the 2019 IEA, the SWMP does not provide a response procedure for exceedance events nor does it provide a reporting procedure for exceedance events. The plan has not been updated since the 2019 IEA and as such remains non-compliant.	Not-compliant		SWMP to be reviewed and updated as necessary following this Audit as per conditions of consent (within three months of submission).	In Progress
25	The Applicant shall prepare and implement a Biodiversity and Rehabilitation Management Plan for the site to the satisfaction of the Secretary. This plan must: (a) be prepared by suitably qualified person(s) whose appointment has been approved by the Secretary;	BRMP provides evidence of Department approval of plan author on 1 July 2015 (Appendix 1). The plan was generally implemented throughout the reporting period with the exception of one penalty notice issued by DPE on 21 May 2021. Holcim failed to undertake a pre-clearance survey prior to clearing vegetation in 2019 and failed to appropriately monitor and assess rehabilitated areas during 2019.	Not-compliant	No further action required	BRMP to be reviewed and updated as necessary following this Audit as per conditions of consent (within three months of submission).	In Progress
27	Within 12 months of the approval of the Biodiversity and Rehabilitation Management Plan, the Applicant shall lodge a Rehabilitation and Conservation Bond with the Department to ensure that the biodiversity offset strategy and the rehabilitation of the site is implemented in accordance with the performance and completion Criteria set out in the Biodiversity and Rehabilitation Management Plan. The sum of the bond shall be determined by: (a) calculating the cost of implementing the biodiversity offset strategy and rehabilitating the site, and (b) employing a suitably qualified quantity surveyor or other expert to verify the calculated costs, to the satisfaction of the Secretary.	Payment of the Rehabilitation and Conservation Bond was due in August 2019 however was not paid until 1/06/2020. The 2019 IEA identified this as a non-compliance and after discussions with DPE, the bond payment was made by Holcim. The DPE approval letter includes approval of suitably qualified experts to undertake the cost calculation. This will remain as a non-compliance as it relates to initial timing of bond payment.	Not-compliant		Bond has been paid, no further action required.	N/A
28	Within 3 months of each independent Environmental Audit (see condition 8 of Schedule 5), the Applicant shall review, and if necessary revise, the sum of the Rehabilitation and Conservation Bond to the satisfaction of the Secretary. This review must consider the: (a) effects of inflation;	As the initial payment was not made until June 2020, this is outside of the 3 month timeframe following the Independent Audit undertaken in September 2019. A review was not able to be undertaken within the timeframe as initial submission had not yet been completed.	Not-compliant		Bond to be reviewed within 3 months of submission of this audit.	Completed
	(b) likely cost of rehabilitating the site (taking into account the likely surface disturbance over the next 3 years of the development and implementing the biodiversity offset strategy; and	As above.	Not-compliant		Bond to be reviewed within 3 months of submission of this audit.	Completed

	(c) performance of the implementation of the rehabilitation of the site performance to date	As above.	Not-compliant		Bond to be reviewed within 3 months of submission of this audit.	Completed
2933	The Applicant shall prepare and implement an Aboriginal Cultural Heritage Management Plan for the Project to the satisfaction of the Secretary. This plan must: (a) be prepared in consultation with Aboriginal stakeholders;	A review of the ACHMP shows that recommendations from the 2016 and 2019 IEAs have not been adopted, as no updates to the consultation section of the ACHMP have been made and no evidence available to indicate that Holcim have tried to close out this lack of consultation in the ACHMP. Forster LALC and Purfleet-Taree LALC have both been attempted to be contacted as per the ACHMP Rev B. Additionally, no approval of the ACHMP is evident within the document, however the requirement for Department approval is noted in Section 1.4	Not-compliant		ACHMP to be reviewed and updated as necessary within 3 months of submission of this audit as per condition of consent.	In Progress
	(c) publish these records on its website at the end of each calendar quarter.	At time of the audit, no truck movement data has been posted on the site website since 2020. Data from 2016-2020 is available.	Not-compliant	Ensure data is posted as per specified timing.	Holcim to publish up to date truck data on website each quarter.	In Progress
1	As soon as practicable after obtaining monitoring results showing an exceedance of any relevant criteria in Schedule 3, the Applicant shall notify affected landowners in writing of the exceedance, except where a negotiated agreement has been entered into in relation to that impact, and provide regular monitoring results to each affected landowner until the development is complying with the relevant criteria.	One over pressure exceedance from a discreet blasting event in Feb 2022 occurred. A discussion was held with an affected sensitive receiver who was not disaffected. Subsequent blasts have not resulted in overpressure exceedances due to a change in blasting subcontractors. Exceedance was minor and would have been negated if annual blast numbers had exceeded 20. EPA did not take action against Holcim and incident reported to the EPA.	Not-compliant	No further action required	Jandra Quarry Manager to develop procedure for notifying landowners. NBMP to be reviewed and updated as necessary following IEA.	In Progress
2	The Applicant shall assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedule 3. Any exceedance of these criteria and/or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.	Non-compliances under conditions in Schedule 3 were recorded during the reporting period. One penalty notice was issued during the reporting period for failing to comply with the BRMP (21 May 2021).	Not-compliant		All management plans will be reviewed and updated as necessary within 3 months of submission of this audit as per the conditions of consent.	In Progress
	(e) a contingency plan to manage any unpredicted impacts and their consequences;	The updated AQMP (2021), BRMP and ACHMP address this condition through the provision of a plan-specific Contingency Plan or similar, however the SWMP and NBMP do not provide a Contingency Plan or similar method for addressing unpredicted impacts.	Not-compliant	Update plans to address specific requirements of Condition 3	SWMP and NBMP to be reviewed and updated as necessary following this IEA.	In Progress
3	(g) a protocol for managing and reporting any: - incidents; - complaints; - non-compliances with statutory requirements; and - exceedances of the impact assessment criteria and/or performance criteria; and	The ACHMP and SWMP do not include protocols for incident response in relation to complaints or exceedances and the ACHMP does not include measures to be taken in the event of unexpected impact on known Aboriginal cultural heritage items. These items were identified in the 2019 IEA but have not been rectified during the reporting period as these plans have	Not-compliant	Update plans to address specific requirements of Condition 3	ACHMP to be reviewed and updated as necessary following this IEA.	In Progress
	Within 3 months of the submission of an: (a) annual review under condition 4 above;	With the exception of the AQMP, management plans have not been updated during the reporting period despite audit recommendations, some changes in site operations and changes in legislation.	Not-compliant	A review of all management plans is recommended to adopt audit recommendations, updates in legislation and any changes to site operations.	All management plans will be reviewed and updated as necessary within 3 months of submission of this audit as per the conditions of consent.	In Progress
5	(c) audit report under condition 8 below; and	The 2019 IEA completed by GHD provided a number of recommendations across management plans that have not been revised during the reporting period.	Not-compliant	A review of all management plans is recommended to adopt audit recommendations, updates in legislation and any changes to site operations.	All management plans will be reviewed and updated as necessary within 3 months of submission of this audit as per the conditions of consent.	In Progress
	Within 3 months of commissioning this audit, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report.	Due to unforeseen environmental and site staffing challenges within Holcim during the audit period, this audit report will not satisfy this condition.	Not-compliant		Submission of this audit closes out this non-compliance action.	N/A

10	By 31 August 2015, the Applicant shall: (a) make the following information publicly available on its website: - the documents listed in condition 2 of Schedule 2; - current statutory approvals for the development; - approved strategies, plans or programs; - a summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this consent; - a complaints register, which is to be updated on a quarterly basis; - the annual reviews (over the last 5 years); - any independent environmental audit, and the Applicant's response to the recommendations in any audit; and - any other matter required by the Secretary; and (b) keep this information up-to-date, to the satisfaction of the Secretary.	No evidence is available on the website that plans are approved and 2021 Annual Review is not available on the website. Previous audit responses and recommendations are also not available.	Not-compliant	Update information available on the site website in accordance with this condition.	Ensure all required information on website is up to date	In Progress
		As above.	Not-compliant		Ensure all required information on website is up to date	In Progress
3	Unless otherwise directed by the Secretary, attended quarterly monitoring is to be used to evaluate compliance with the relevant conditions of this consent.	On 27 August 2021, an EPL variation was issued to EPL 2796 allowing noise monitoring to be undertaken on an annual basis instead of quarterly, based on no noise complaints being received since 2016 and ongoing compliance of noise monitoring results. Noise monitoring was carried out quarterly until 2021. This condition under the Modified Consent still directs noise monitoring to be undertaken quarterly; no evidence of approval of this change in monitoring frequency by the Secretary has been sighted.	Not-compliant	Confirm that EPL monitoring requirements are approved by the Secretary to align with Modified Consent.	The approved NBMP allows the project to move to annual monitoring on the schedule (2 years after stage commences) as provided in 6.2 of the NBMP. Plan was approved by DPIE on 22 August 2018. No further action required.	N/A
P1.4	The following points referred to in the table below are identified in this licence for the purposes of weather and/or noise monitoring and/or setting limits for the emission of noise from the premises.	Noise and weather monitoring are being carried out at the specified locations. Airblast overpressure and ground vibration have only been undertaken at Receptor R2 (EPA ID 3) during blasting operations. During an interview with M Neil, it was discussed that the wording from L5.2 ad L5.3 "...at either monitoring point 2 or 3 of this licence" had been interpreted as only one of these monitoring points needing to be monitored during blasting activities. Subsequently, only R2 (112 Spicers Rd) has had airblast overpressure and vibration monitoring carried out during the reporting period.	Not-compliant	Ensure both R2 and R4 are monitored as specified during blasting activities.	Both R2 and R4 to be monitored. Previous Quarry manager interpreted wording incorrectly. NBMP to be reviewed and updated as required following submission of IEA	In Progress
L3.2	The licensee must not: • Process more than 3000 tonnes of concrete "wash-out" per annum; • Store more than 1000 tonnes of concrete "wash-out" on the premises at any one time.	Imported concrete washout waste tonnages are approximated as per correspondence with P Wilson. By tonnage approximations, concrete waste imported onto the site totalled 3600T in 2020, 1770T in 2021 and 2862.9T in 2022 up until the date of the audit. 2020 tonnages exceeds the annual limit of 3000T p.a. It is noted that tonnages recorded within the spreadsheet are seemingly non approximated as of April 2022.	Not-compliant		Measurements are no longer estimated. No further action required.	NA
L4.1	Noise generated at the premises must not exceed the noise limits in the tables below. The locations referred to in the tables below are indicated in the document titled: "Jandra Quarry Intensification of Production Environmental Assessment (DA 231-10-99 MOD 5)" Dated July 2014	As below.	Not-compliant		N/A - line item not a non compliance in itself	N/A
L4.2	Noise from the premises during quarrying operations only must not exceed the limits specified in the following table:	Noise at the site was generally compliant across all locations during the reporting period. One exceedance was recorded at R2 (EPA13) in March 2021, with <39 dB recorded at a location with a limit of 36dB. This exceedance was due to a bulldozer conducting overburden maintenance as required every two years; the bulldozer was immediately relocated to a lower level within the pit and Holcim implemented a long-term management measure to ensure overburden maintenance is not conducted within the morning shoulder period, when the exceedance was recorded.	Not-compliant		This item is currently subject to investigation by DPE. Holcim have responded to an information request and are currently awaiting further response from DPE. Holcims initial response noted that the site responded to this elevated noise result by immediately relocating the bulldozer to a lower level to attenuate the impact. Subsequent monitoring during the same Q1 2021 noise monitoring event at R6 (EPA16), which is only 60 metres away from R2, was below the noise criteria following relocation of the dozer. Further Holcim would like to note that there have been no further noise exceedances at Jandra quarry since the Q1 2021 monitoring event. This is evidenced in the monitoring results provided in the 2021 Annual report, and those which will be provided by March 31 2023 in the 2022 Annual Report. Holcim received a warning letter for the breach which instructed Holcim to review and if necessary revise the Noise and Blast Management Plan by 31 March 2023. However, given that the warning letter was based upon an out of date management plan (2015), DPE subsequently advised the warning letter would be withdrawn and reissued. Holcim are awaiting the reissue and	In Progress

M1.1	The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.	See findings below.	Not-compliant		N/A - line item not a non compliance in itself	N/A
M1.3	b) the time(s) at which the sample was collected;	Raw monitoring data available included PM10 monitoring data, which included a column for time of sampling that was largely incomplete. Other monitoring data available did not include sample times.	Not-compliant		it is a 24 hr equipment sampling period for PM10. Date provided is therefore adequate. It is unclear what 'other data' is being referred to by the auditor. Holcim note that all Chain of Custody documents record the time the sample was collected.	N/A
	d) the name of the person who collected the sample.	Raw monitoring data available did not include the name of person collecting the sample.	Not-compliant		Name is in Chain of Custody documents which is normal practice to meet this condition. Holcim keep a copy of all CoC documents.	N/A
R1.1	The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: 1. a Statement of Compliance, 2. a Monitoring and Complaints Summary, 3. a Statement of Compliance - Licence Conditions, 4. a Statement of Compliance - Load based Fee, 5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan, 6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and 7. a Statement of Compliance - Environmental Management Systems and Practices. At the end of each reporting period, the EPA will provide to the licensee notification that the Annual Return is due.	Copies of Annual Returns within the reporting period were not able to be supplied by Holcim and as such their contents could not be verified. Confirmed with NSW EPA representative 2 November 2022 via phone call that all Annual Returns within the reporting period had been submitted.	Not-compliant	Ensure Annual Returns are saved as .pdf files on accessible servers (instead of only saving within the EPA portal) so all relevant staff have access.	Annual Returns were submitted as per the approved form as evidenced on the EPA eConnect website.	N/A
R1.5	The Annual Return for the reporting period must be supplied to the EPA via eConnect EPA or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').	Annual Return for 2019 - 2020 received by EPA 8th July 2020 - outside of 60 day timeframe Annual Return for 2020 - 2021 received by EPA 5th July 2021 - outside of 60 day timeframe Annual Return for 2021 - 2022 received by EPA 29th June 2022 - within 60 day timeframe	Not-compliant		Holcim note the 21/22 Annual Return was submitted within the timeframe. Changes in staffing resulted in improved compliance which will be maintained going forward.	N/A
R1.6	The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.	Copies of Annual Returns within the reporting period were not able to be supplied by Holcim and as such their retention periods were not able to be verified.	Not-compliant		Copy is retained on eConnect, the 'approved form'. Holcim will also ensure a copy is held on their own server going forwards. The last 4 years of Annual returns have been downloaded from eConnect and are on the Holcim system in pdf format.	N/A
R1.7	Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by: a) the licence holder; or	Copies of Annual Returns within the reporting period were not able to be supplied by Holcim and as such their contents could not be verified.	Not-compliant		This was completed and as such is not a non-compliance.	N/A
	b) by a person approved in writing by the EPA to sign on behalf of the licence holder.	Copies of Annual Returns within the reporting period were not able to be supplied by Holcim and as such their contents could not be verified.	Not-compliant		This was completed and as such is not a non-compliance.	N/A
R4.1	A noise compliance assessment report(s) must be submitted to the EPA with each Annual Return. The assessment must be prepared by a suitably qualified and experienced acoustical consultant and include: a) an assessment of compliance with noise limits detailed in the limit conditions of this licence;	Copies of Annual Returns within the reporting period were not able to be supplied by Holcim and as such their contents could not be verified.	Not-compliant		Noise reports were produced and submitted through the Annual Reporting process to DPE. However they are not provided to EPA alongside the annual return. It has now been noted in Holcims Annual Environmental Commitments Planner that the reports must be provided with the Annual Return submission.	As per Annual Return requirements.
	b) details of all quarrying activities that were occurring during each of the periods of monitoring, and	Copies of Annual Returns within the reporting period were not able to be supplied by Holcim and as such their contents could not be verified.	Not-compliant		Noise reports were produced and submitted through the Annual Reporting process to DPE. However they are not provided to EPA alongside the annual return. It has now been noted in Holcims Annual Environmental Commitments Planner that the reports must be provided with the Annual Return submission.	As per Annual Return requirements.
	c) an outline of any management actions taken within the monitoring period to address any exceedences of the limits detailed in the limit conditions of this licence.	Copies of Annual Returns within the reporting period were not able to be supplied by Holcim and as such their contents could not be verified.	Not-compliant		Noise reports were produced and submitted through the Annual Reporting process to DPE. However they are not provided to EPA alongside the annual return. It has now been noted in Holcims Annual Environmental Commitments Planner that the reports must be provided with the Annual Return submission.	As per Annual Return requirements.

R4.2	The licensee must supply, with each Annual Return, a Blast Monitoring Report which must include the following information relating to each blast carried out within the premises during the reporting period covered by the Annual Return: a) the date and time of the blast;	Copies of Annual Returns within the reporting period were not able to be supplied by Holcim and as such their contents could not be verified.	Not-compliant		Blast monitoring was reported and submitted through the Annual Reporting process to DPE. However it was not provided to EPA alongside the annual return. It has now been noted in Holcims Annual Environmental Commitments/ Site Improvement Planner that the reports must be provided with the Annual Return submission.	As per Annual Return requirements.
	b) the location of the blast on the premises;	Copies of Annual Returns within the reporting period were not able to be supplied by Holcim and as such their contents could not be verified.	Not-compliant		Blast monitoring was reported and submitted through the Annual Reporting process to DPE. However it was not provided to EPA alongside the annual return. It has now been noted in Holcims Annual Environmental Commitments/ Site Improvement Planner that the reports must be provided with the Annual Return submission.	As per Annual Return requirements.
	c) the blast monitoring results at each blast monitoring station; and d) an explanation for any missing blast monitoring results.	Copies of Annual Returns within the reporting period were not able to be supplied by Holcim and as such their contents could not be verified.	Not-compliant		Blast monitoring was reported and submitted through the Annual Reporting process to DPE. However it was not provided to EPA alongside the annual return. It has now been noted in Holcims Annual Environmental Commitments/ Site Improvement Planner that the reports must be provided with the Annual Return submission.	As per Annual Return requirements.
3	In the 2019, 2020 and 2021 Annual Reviews, Holcim reported instances of non-compliance with the consent which were not reported at the time to the Secretary in accordance with the consent. As such, the department considers that the IEA should include a focus on the adequacy of the plans, programs and strategies for the development to address all notification and reporting requirements of the development consent.	Holcim's reporting and notification systems are detailed in both the EMS and relevant subplans, however these have not been updated within the reporting period in response to reporting failures. Reporting and notification relies primarily upon site staff communicating non-compliances with corporate environmental staff however no tangible changes appear to have been made following lack of reporting in this instance.	Not-compliant	Update the EMS as required, communicate the reporting process to all site staff and ensure all subplans are updated to include usable reporting procedures.	Holcim have switched monitoring contractors to one that utilises an online portal with alert system. This alert is sent to both site and corporate staff. Reporting has improved dramatically following the implementation of this system, with no further evidence of failure to report. Holcim have moved to iCare incident reporting system which notifies corporate staff through an online notification protocol.	Already implemented.