



Strength. Performance. Passion

# Lynwood Quarry

## 2023 Annual Review

1 January 2023 – 31 December 2023

# Table of Contents

<b>1.0</b>	<b>Statement of Compliance</b>	<b>1</b>
<b>2.0</b>	<b>Introduction</b>	<b>4</b>
2.1	Quarry Contacts	4
2.2	Annual Review Requirements	4
<b>3.0</b>	<b>Approvals</b>	<b>10</b>
3.1	Development Consent History	10
3.2	Management Plan Approvals	11
<b>4.0</b>	<b>Operations Summary</b>	<b>12</b>
4.1	Quarrying Operations	12
4.2	Production Limits	12
4.2.1	Hours of Operation	13
4.2.2	Vehicle Movements	13
4.3	Construction Activities	14
<b>5.0</b>	<b>Actions Required from Previous Annual Review</b>	<b>15</b>
5.1	Actions from 2022 Annual Review – DPHI Actions	15
5.2	Actions From the 2022 Annual Review – Holcim Proposed 2023 Actions	15
<b>6.0</b>	<b>Environmental Performance</b>	<b>16</b>
6.1	Summary of Performance Against EA Predictions	16
6.1.1	Air Quality Predictions Against the EA	19
6.1.2	Surface Water Quality Predictions Against the EA	19
6.1.3	Groundwater Predictions Against the EA	19
6.1.4	Noise Predictions Against the EA	20
6.2	Meteorological Monitoring	21
6.3	Air Quality	22
6.3.1	Environmental Management Measures	22
6.3.2	Performance Criteria	22
6.3.3	Environmental Outcomes	24
6.3.4	Trends in data	29
6.3.5	Incident Notification	30
6.3.6	Proposed Improvements for the Next Report Period	30
6.4	Surface Water	31
6.4.1	Environmental Management Measures	31
6.4.2	Performance Criteria	31
6.4.3	Environmental Outcomes	33
6.4.4	Trends in Data	38
6.4.5	Proposed Improvements	38

6.5	Groundwater	39
	6.5.1 Environmental Management Measures	39
	6.5.2 Performance Criteria	39
	6.5.3 Environmental Trends and Outcomes	40
	6.5.4 Proposed Improvements	43
6.6	Noise	44
	<b>6.6.1 Environmental Management Measures</b>	44
	<b>6.6.2 Performance Criteria</b>	44
	<b>6.6.3 Environmental Outcomes</b>	44
	<b>6.6.4 Trends in Data</b>	47
	<b>6.6.5 Proposed Improvements</b>	47
6.7	Biodiversity	48
	6.7.1 Environmental Management Measures	48
	6.7.2 Performance Criteria	48
	6.7.3 Environmental Outcomes	48
	6.7.4 Trends in Data	50
	6.7.5 Proposed Improvements or Actions Next Reporting period	50
6.8	Weeds and Feral Animals	50
	6.8.1 Weeds	50
	6.8.2 Feral Animals	50
6.9	Blasting and Vibration	51
	6.9.1 Environmental Management Measures	51
	6.9.2 Performance Criteria	51
	6.9.3 Environmental Outcomes	52
	6.9.4 Trends in Data	52
	6.9.5 Proposed Improvements	52
6.10	Waste Management	53
6.11	Indigenous Heritage	53
	6.11.1 Results of Aboriginal Heritage Site Monitoring	53
	6.11.2 Meetings of the Aboriginal Heritage Management Committee	54
	6.11.3 Keeping Place Contract Development	54
	6.11.4 Revisions to the Aboriginal Heritage Management Plan	54
6.12	Non-Indigenous Heritage	54
6.13	Bushfire Management	55
6.14	Public Safety	55
<b>7.0</b>	<b>Water Management</b>	<b>56</b>
	7.1 Water Management System	56
	7.2 Water Take and Discharge	56
	7.3 Erosion and Sedimentation	57
	7.3.1 Environmental Management Measures	57

7.3.2	Proposed Improvements	57
<b>8.0</b>	<b>Rehabilitation</b>	<b>58</b>
8.1	Status of Quarrying and Rehabilitation	58
8.2	Post Rehabilitation Land Uses	60
8.3	Rehabilitation Activities	60
<b>9.0</b>	<b>Community</b>	<b>61</b>
9.1	Community Engagement	61
9.1.1	Community Consultative Committee Meetings	61
9.1.2	Community Activities	61
9.1.3	Community Investment Fund	61
9.2	Complaints	62
9.3	Independent Audit	64
<b>10.0</b>	<b>Incidents and Non-Compliances during the Report Period</b>	<b>65</b>
<b>11.0</b>	<b>Activities to be Completed in the Next Report Period</b>	<b>68</b>

## Figures

Figure 1: Locality Plan (Umwelt, 2016)	7
Figure 2: Overview of Operations (Umwelt, 2016)	8
Figure 3: Lynwood Quarry footprint December 2023 (source nearmaps, 2023)	9
Figure 4: Environmental Monitoring Network (Air Quality Management Plan, 2023)	23
Figure 5: Historical Depositional Dust Monitoring	29
Figure 6: Historical PM <sub>10</sub> Monitoring Results	30

## Tables


Table 1: Statement of Commitments	1
Table 2: Compliance Status Key for Table 3	1
Table 3: 2023 Non-Compliances	2
Table 4: Key personnel responsible for environmental management	4
Table 5: Development Consent 128-5-2005 (MOD 5) conditions for the Annual Review	5
Table 6 Approvals and licences held by Holcim.	10
Table 7: Long-term Production Summary (tonnes)	13
Table 8: Operating hours at Lynwood Quarry	13
Table 9: Summary of Laden Trucks Movements 2023	14
Table 10: Actions Required from the 2023 Annual Review (Proposed by Holcim)	15
Table 11: Summary of the environmental performance during the report period	17
Table 12: Meteorological Monitoring Results Summary 2023.	21
Table 13: Air quality impact assessment criteria	22
Table 14: 2023 Depositional Dust Monitoring Results.	24
Table 15: 2023 PM <sub>10</sub> Compliance Summary	25
Table 16: Summary of Non-Compliant or Invalid PM <sub>10</sub> Monitoring Results	25
Table 17: HVAS 2023 PM <sub>10</sub> Monitoring Results	26

Table 18: Trigger Values for Key Water Parameters – from Surface Water Management Plan (2020)	32
Table 19: Summary of Results – Surface Water 2023	34
Table 20 - Yearly Comparison of Average Surface Water Results	35
Table 21: Groundwater Monitoring Criteria (WMP, 2020)	40
Table 22: Summary of Quarterly Results – Groundwater 2023	41
Table 23: Noise Criteria	44
Table 24: Noise Monitoring locations	45
Table 25: Noise Monitoring Summary 2023	46
Table 26: Summary of Biodiversity Credits to be Retired.	48
Table 27: Summary of Retired Biodiversity Credits	49
Table 28: Pest Report 2023	50
Table 29: Blast Criteria Summary	51
Table 30: Blast Monitoring 2023. Summary	52
Table 31: Long-term Summary of Waste Generation	53
Table 32: 2023 Water Take Summary	56
Table 33: Rehabilitation Status	59
Table 34: 2023 Community Engagement Activities and Sponsorship	61
Table 35: Comparison of complaints for Lynwood 2014 - 2023	63
Table 36: Summary of Incidents	66

## Appendices

Appendix 1	2023 Noise Monitoring Reports
Appendix 2	Environmental Monitoring Results
Appendix 3	Independent Audit Action List
Appendix 4	Approved CIF-Funded Projects since CIF Inception

## Title Block

<u>Name of operation</u>	Lynwood Quarry
<u>Name of operator</u>	Holcim (Australia) Pty Ltd
<u>Development consent #</u>	DA 128-5-2005
<u>Annual review start date</u>	1 January 2023
<u>Annual review end date</u>	31 December 2023
<p>I, Wayne Beattie, certify that this audit report is a true and accurate record of the compliance status of Lynwood Quarry for the period 1 January 2023 to 31 December 2023 and that I am authorised to make this statement on behalf of Holcim.</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>	
<u>Name of authorized reporting officer</u>	Wayne Beattie
<u>Title of authorized reporting officer</u>	Lynwood Quarry Manager
<u>Signature of authorised reporting officer</u>	
<u>Date</u>	04/03/2024

# 1.0 Statement of Compliance

This Annual Review has been prepared to provide a summary of the performance of the Lynwood Quarry operations over the period 1 January 2023 to 31 December 2023 (referred to hereafter as the report period). The compliance of the operation with relevant approvals is summarised in Table 1.

**Table 1** below provides a statement of compliance for the report period. The non-compliances have been ranked according to the risk matrix included in **Table 2**. A description of each non-compliance is provided in **Table 3**.

**Table 1: Statement of Commitments**

Relevant Approval	All Conditions Complied With?
Development Consent (DA) 128-5-2005 (Mod 5)	No
Environment Protection Licence (EPL) 12939	No

**Table 2: Compliance Status Key for Table 3**

Risk Level	Colour Code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of likelihood of occurrence
Medium	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>
Low	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>
Administrative Non-compliance	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 condition)

Source: Annual Review Guideline (NSW Government, 2015)

**Table 3: 2023 Non-Compliances**

Relevant approval	Condition	Non Compliance Summary	Compliance status	Comment from Holcim	Where addressed in this Report
DA128-5-2005 (Mod 5)  EPL 12939	Condition 15 of Schedule 3 (Air Quality Management Plan)  Condition 12 of Schedule 3 (Impact Air Assessment)  Condition M2.2 (EPL Air Quality Monitoring Requirements)	Multiple invalidated or exceeded samples recorded during the 2023 reporting period.	<b>Low Non-Compliance</b>	HVAS 1 PM <sub>10</sub> missed samples occurred on: <ul style="list-style-type: none"> <li>• April 25, 2023</li> <li>• July 6, 2023</li> <li>• August 11, 2023</li> <li>• August 17, 2023</li> <li>• August 23, 2023</li> <li>• September 16, 2023</li> <li>• September 22, 2023</li> <li>• October 4, 2023</li> </ul> HVAS1 PM <sub>10</sub> exceedance occurred on: <ul style="list-style-type: none"> <li>• April 25, 2023 (58.4 µg/ m3)</li> </ul> HVAS2 PM <sub>10</sub> missed sample on: <ul style="list-style-type: none"> <li>• May 7, 2023</li> </ul> HVAS 2 PM <sub>10</sub> exceedance occurred on: <ul style="list-style-type: none"> <li>• February 24, 2023 (63.4 µg/ m3)</li> </ul> PM <sub>10</sub> monitoring will continue.	<b>Section 6.3</b>
DA128-5-2005 (Mod 5)	Condition 23 of Schedule 3 (Surface Water Management Plan)	Non-Compliance for failing to notify the Department of surface water exceedances.  (Exceedances in pH, and Oil and Grease.)	<b>Admin Non-Compliance</b>	As per the Water Management Plan (WMP), Holcim failed to notify the Department of Planning Housing and Infrastructure (DPHI) or Environment Protection Agency (EPA) when two or more exceedances of trigger levels were recorded over consecutive months: <ul style="list-style-type: none"> <li>• Oil and Grease exceeded criteria levels more than twice at SW4, SW5 over consecutive months,</li> <li>• pH exceeded criteria at SW9, SW</li> </ul>	<b>Section 6.4</b>



Relevant approval	Condition	Non Compliance Summary	Compliance status	Comment from Holcim	Where addressed in this Report
				10 and SW 11 more than twice over consecutive months	
DA128-5-2005 (Mod 5) EPL 12939	Condition 24 of Schedule 3 (Groundwater Management Plan)	Non-Compliance for failing to notify the Department of ground water exceedances	<b>Admin Non-Compliance</b>	As per the WMP, Holcim failed to notify the DPHI or EPL when two or more exceedances of trigger levels were recorded over consecutive months: <ul style="list-style-type: none"> <li>pH exceeded at GPZ1 and GPZ5 during all four monitoring events.</li> </ul>	<b>Section 6.5</b>
DA128-5-2005 (Mod 5)	Condition 11 of Schedule 5 (Independent Environmental Audit)	Lynwood failed to undertake the 2023 Independent Environmental Audit within the time period specified by the development consent	<b>Admin Non-Compliance</b>	Holcim acknowledges that the IEA was unable to be conducted by September 2023. On 12 January 2024, EMM undertook the IEA for Lynwood Quarry.	<b>Section 9.3</b>
DA128-5-2005 (Mod 5)	Condition 8 of Schedule 5 (Incident Reporting)	Holcim failed to notify the department of surface and ground water exceedances during the 2023 reporting period	<b>Admin Non-Compliance</b>	Holcim acknowledges that notifications pertaining to water exceedances were not notified to the Department or EPL.	<b>Section 10</b>

## 2.0 Introduction

Holcim (Australia) Pty Ltd (Holcim) owns and operates Lynwood Quarry, a hard rock quarry located west of Marulan, approximately 160 km southwest of Sydney and 27 km northeast of Goulburn in New South Wales (NSW), as seen in **Figure 1** and **Figure 2**.

Holcim is the trading name for Holcim (Australia) Pty Ltd which, as a member of the Large Holcim group, is one of the leading suppliers of heavy construction material products in Australia, operating over 80 quarries, over 200 fixed concrete plants and a fleet of over 900 concrete delivery trucks. Holcim began quarry operations at Lynwood Quarry in 2015 and since this time has provided high quality sand and aggregates for use in construction and landscaping across the local, regional and Sydney markets.

Holcim was granted Development Consent in December 2005 (DA 128-5-2005) (Development Consent) by the then NSW Minister for Planning for the construction and operation of Lynwood Quarry. There have been 5 modifications approved to the Development Consent under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act) since 2005.

On 18 May 2016, Lynwood Quarry was granted modification to commence quarrying and associated activities in an alternative resource known as the Granite Pit located to the north-west of the Approved Pit area (refer to **Table 4**). The approval also allowed for the reduction in the extent of the approved pit to reflect limitations within the ignimbrite resource. Operations have continued in the Granite Pit since this time.

### 2.1 Quarry Contacts

The Lynwood Quarry Works Manager is responsible to the regulatory authorities for all aspects of environmental compliance at the site. Key personnel at Lynwood Quarry are described in **Table 4**.

**Table 4: Key personnel responsible for environmental management**

Name	Role	Company	Contact Details
Wayne Beattie	Quarry Manager	Holcim	Office 4820 7007 M +61 419 476 900
Mohsen Vafaeifard	Support Services Supervisor	Holcim	M +61 411 161 286
Dozie Egeonu	Environment Manager - NSW	Holcim	M +61 429 557 493

### 2.2 Annual Review Requirements

Condition 10 of Schedule 5 of the Lynwood Quarry Development Consent requires an Annual Review (AR) to be prepared and submitted to the Department of Planning, Housing, and Infrastructure (DPHI) (the Department) This report has been prepared in accordance with the *NSW Government Annual Review Guideline* (NSW Government, 2015) and details the operational and environmental management activities of Lynwood Quarry during the report period 1 January 2023 to 31 December 2023. Development Consent requirements along with an explanation of where each requirement is addressed within this document are provided in **Table 5**.

**Table 5: Development Consent 128-5-2005 (MOD 5) conditions for the Annual Review**

<b>Conditions</b>		<b>Addressed in Section</b>
<b>Schedule 2 – General Administrative Conditions</b>		
<b>Production Data</b>		
13.	The Applicant must (a) Provide annual quarry production data to DRG using the standard form for that purpose; and (b) Include a copy of this data in the Annual Review.	<b>Section 4.2</b>
<b>Schedule 3 – Specific Environmental Conditions</b>		
<b>Monitoring of Quarry Product Transport</b>		
33A.	The Applicant must keep accurate records of all laden truck movements from the site (weekly, monthly, and annually) and publish a summary of records in its Annual Review.	<b>Section 4.2.2</b>
<b>Schedule 3 – Specific Environmental Conditions</b>		
<b>Retirement of Biodiversity Credits</b>		
48A.	The Applicant must retire the biodiversity credits specified in Table 11 to the satisfaction of the Secretary and OEH. The retirement of credits must be undertaken in accordance with the Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects by: (a) acquiring or retiring credits under the Biobanking Scheme in the TSC Act; (b) making payments into an offset fund that has been developed by the NSW Government; or (c) providing supplementary measures.	<b>Section 6.7</b>
<b>Schedule 3 – Specific Environmental Conditions</b>		
<b>Waste Management</b>		
53	The Applicant must: (d) Report on waste management and minimisation on the Annual Review. to the satisfaction of the Secretary.	<b>Section 6.10</b>
<b>Schedule 5 – Environmental Management, Reporting and Auditing</b>		
<b>Annual Review</b>		
10	By the end of September each year, or other timing as may be agreed by the Secretary, the Applicant must review the environmental performance of the development to the satisfaction of the Secretary. This review must:	<b>This document</b>
	(a) Describe the development (including rehabilitation) that was carried out in the previous financial year, and the development that is proposed to be carried out over the current financial year;	<b>Section 4.0, Section 6.0, and Section 8.0</b>
	(b) Include a comprehensive review of the monitoring results and complaints records of the development over the previous financial year, which includes a comparison of these results against: <ul style="list-style-type: none"> <li>The relevant statutory requirements, limits, or performance measures/criteria;</li> <li>The requirements of any plan or program required under this consent;</li> <li>The monitoring results of previous years; and</li> <li>The relevant predictions in the documents listed in condition 2(a) of Schedule 2;</li> </ul>	<b>Section 6.0 and Section 9.2</b>

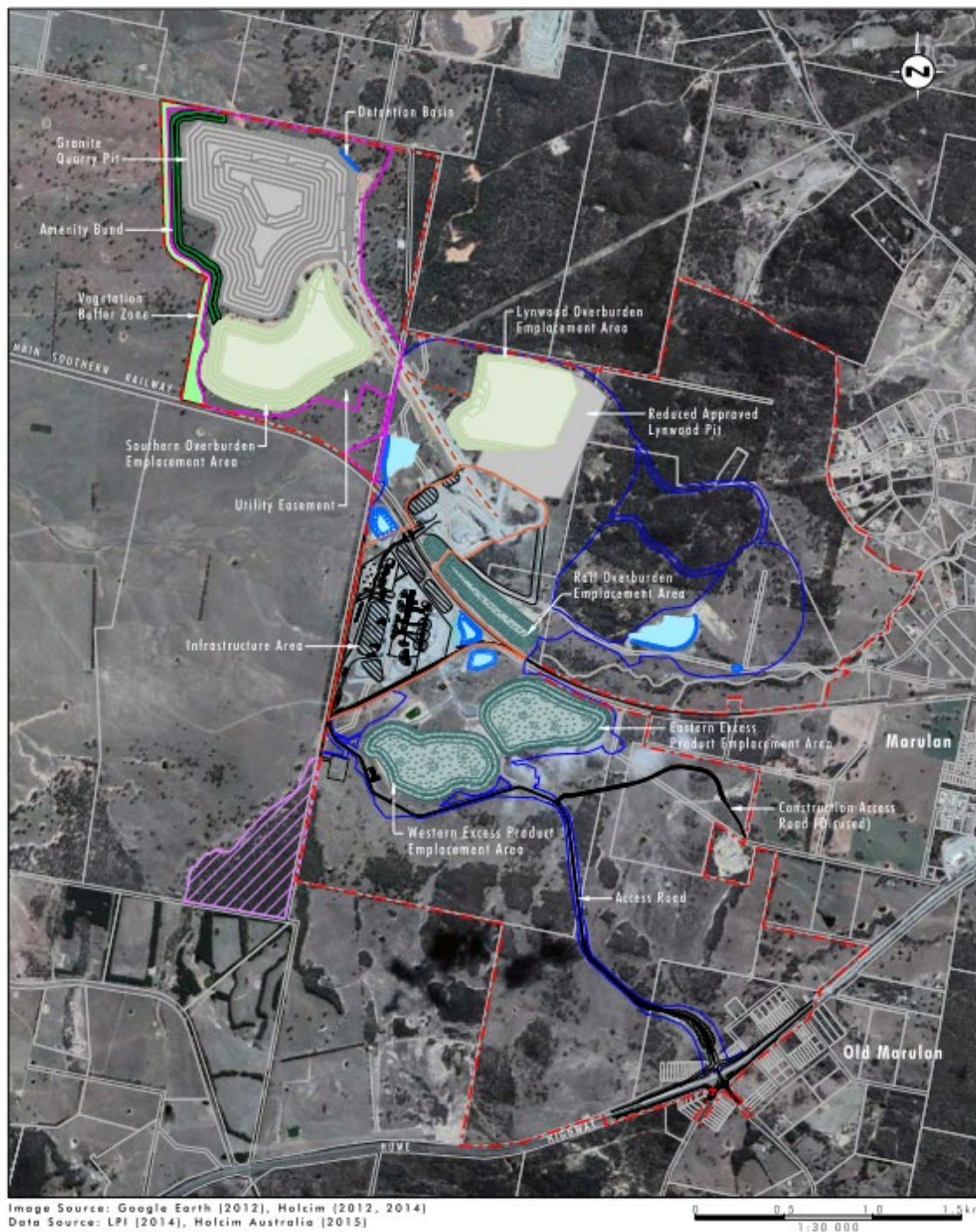
Conditions		Addressed in Section
	(c) Identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;	<b>Section 1.0 and Section 11.0</b>
	(d) Identify any trends in the monitoring data over the life of the development;	<b>Section 6.0</b>
	(e) Identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of significant discrepancies;	<b>Section 6.1</b>
	(f) Describe what measures will be implemented over the current financial year to improve the environmental performance of the development;	<b>Section 6.0</b>
	(g) Describe the area of vegetation cleared as part of the development and identify the area proposed to be cleared over the next 5 years;	<b>Section 6.7</b>
	(h) Calculate the number of additional Bio Banking (or equivalent) credits that will need to be purchased, before that clearing can be done; and	<b>Section 6.7</b>
	(i) Report on the number of Bio Banking (or equivalent) credits that have been purchased to allow ongoing clearing and completion of stages.	<b>Section 6.7</b>



FIGURE 2.1  
Locality Plan

File Name (A4): R01/4541\_001.dgn  
20190321 13.46

Figure 1: Locality Plan (Umwelt, 2016)



Legend					
	Approved Project Area		Quarry Pit		Haul Road
	Lynwood Infrastructure Area		Emplacement Area		Dam
	Approved Disturbance Footprint		Overburden Emplacement Area		Vegetation Buffer Zone
	Granite Pit Disturbance Footprint		Amenity Bund		
	Lynwood Infrastructure Layout				
	Habitat Management Area				

FIGURE 2.2  
 Overview of Operations

File Name (A4): R01/4541\_002.dgn  
 20190321 13.46

Figure 2: Overview of Operations (Umwelt, 2016)



**Figure 3: Lynwood Quarry footprint December 2023 (source nearmaps, 2023)**

## 3.0 Approvals

Approvals currently held by Lynwood Quarry are listed in **Table 6**.

**Table 6 Approvals and licences held by Holcim.**

Approval and Relevant Legislation	Details
Development Consent (DA) 128-5-2005 (Mod 5) <i>NSW Environmental Planning and Assessment Act 1979</i>	The MOD 5 Development Consent applied through the report period. Mining operations permitted to 1 January 2038 in accordance with the MOD 5 Development Consent.
Part 3A permit <i>Water Management Act 2000</i>	Obtained for works within 40 m of stream.
Part 2 Licence <i>Water Act 1912 Part 2</i>	Obtained for surface water capture and use.
Part 5 Licence <i>Water Act 1912 Part 5</i>	Obtained for groundwater monitoring.
Controlled Activity Approval (CAA) No. 10 ERM 2011/0446 <i>Rivers and Foreshores Improvement Act 1948</i>	Works within the riparian zones on site.
Environment Protection Licence (EPL) 12939 <i>Protection of the Environment Operations Act 1997</i>	Held by Holcim over the Lynwood Quarry premises. EPL 12939 was varied 27 October 2023
Water Access Licence (WAL) No. 25575	Obtained under the water sharing plan for the Upper Nepean and Upstream Warragamba Water source (refer to <b>Section 7.2</b> )
Aboriginal Heritage Impact Permit (AHIP) No. 1100264 <i>National Parks and Wildlife Act 1974</i>	Discussed further in <b>Section 6.11</b> .

### 3.1 Development Consent History

The original Lynwood Quarry Development Consent 128-5-2005 (Development Consent) was granted on 21 December 2005. Subsequent modifications to the Development Consent were approved in 2009, 2011, 2016.

In May 2018, Lynwood Quarry was granted approval (MOD 5) to modify Condition 48A of Schedule 3 of the Development Consent. This condition related to the retirement of biodiversity credits for the site. All references to Development Consent conditions within this document refer to the MOD 5 unless stated otherwise.



## 3.2 Management Plan Approvals

Environmental monitoring data and a copy of the current Lynwood Quarry Management Plans are published on the Holcim website (<https://www.holcim.com.au/lynwood>). During the preparation of this Annual Review, Holcim has assessed the need to review or update Management Plans. This must be submitted within 3 months under schedule 5 condition 5.

The following Management Plan have been approved in the 2023 reporting period:

- Air Quality Management Plan (2023)

No further Management Plans have been submitted to the Department for review during the 2023 reporting period.

## 4.0 Operations Summary

A summary of the operations undertaken at Lynwood Quarry during the reporting period is presented in the following sections.

### 4.1 Quarrying Operations

Quarrying operations commenced in the Granite Pit in 2017 and have continued through the 2023 reporting period.

The quarrying process on site consists of the following four stages:

- Clearing and topsoil stripping – typically undertaken using a dozer and/or excavator in accordance with Lynwood Quarry’s clearing procedure, with selected material stockpiled for later use in rehabilitation;
- Overburden removal and emplacement – overlain material is typically removed via blasting and hauled to emplacement areas;
- Blasting, loading and haulage of primary raw feed (PRF) material – target resource removed via drill and blast then loaded by front-end loaders into haul trucks for transportation to the primary crusher; and
- Crushing and screening – resources are processed by the primary crusher and are then transported via conveyor to the infrastructure area for tertiary processing and screening. Products are stockpiled awaiting transport to local, regional and Sydney markets via road and rail transportation methods.

During the 2023 reporting period, Lynwood Quarry undertook 6.2 ha of active stripping, with Narla Environmental Pty Ltd (Narla) providing Pre and Post Clearing reports. Clearing of vegetation occurred on the 20 January 2023 with an experienced Narla ecologist supervising all works. No fauna was observed in the clearing works, and no injuries or deaths were recorded.

### 4.2 Production Limits

Production in 2023 met the limits on total saleable product and amount of product transported by road outlined in Schedule 2 Condition 13 of the Development Consent. During the report period, a total of 2,185,343 tonnes of quarry product was transported from the quarry by road and rail. This is more than the total production for the previous reporting period. In 2022 a total of 2,085,790 tonnes was transported from the quarry by road transport using Hume Highway.

**Table 7** provides the annual production and transportation volumes from 2021 to 2023 reporting periods and provides a forecast for the 2024 report period.

**Table 7: Long-term Production Summary (tonnes)**

Material	Approved limit.	2021 (actual)	2022 (actual)	2023 (actual)	2024 (forecast)	Compliance
Product - total	5 million tonnes from the site in a year	2,018,000	2,085,790	2,185,343	2,400,000	Yes
Product Transported - Rail	5 million tonnes from the site in a year	696,409	897,015	1,135,082	1,200,000	Yes
Product Transported - Road	1.5 million tonnes from the site in a year by road	1,129,000	1,188,775	1,050,261	1,200,000	Yes

#### 4.2.1 Hours of Operation

Lynwood Quarry operates in accordance with the operating hours specified in **Table 8**.

**Table 8: Operating hours at Lynwood Quarry**

Activity	Day	Time	Compliance with Operating Hours during this report period
Construction works.	Monday – Friday	7am to 6pm	Yes
	Saturday	8am to 1pm	Yes
	Sunday and Public Holidays	None	Yes
Topsoil/overburden removal/emplacment; drilling.	Any day	7am to 6pm	Yes
Blasting.	Monday – Saturday	9am to 5pm	Yes
	Sunday and Public Holidays	None	Yes
Extraction.	Any day	7am to 10pm	Yes
Processing (crushing, screening, stockpiling); loading, delivery, and distribution; maintenance.	Any day	Anytime	Yes

#### 4.2.2 Vehicle Movements

In accordance with Condition 33A of Schedule 3 of the Development Consent, the number of laden truck movements from Lynwood Quarry are summarised in **Table 9**. Product transported by road from Lynwood Quarry is restricted to less than 1.5 million tonnes per annum. The 2023 report period road transport tonnages comply with the approved limits.

**Table 9: Summary of Laden Trucks Movements 2023**

Month	Laden Truck Movements	Product by Road Transport (tonnes)
January	1,898	65,235
February	2,665	94,289
March	2,621	123,117
April	2,210	77,421
May	2,362	80,845
June	3,174	113,034
July	2,279	76,649
August	2,241	84,122
September	2,704	124,456
October	1,796	90,339
November	3,110	114,663
December	1,810	90,906
<b>Total</b>	<b>28,870</b>	<b>1,135,082</b>

### 4.3 Construction Activities

No construction activities occurred during the reporting period.

## 5.0 Actions Required from Previous Annual Review

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

Holcim did not receive a letter requesting actions from DPHI following the submission of the 2022 Annual Review in March 2023.

### 5.2 Actions From the 2022 Annual Review – Holcim Proposed 2023 Actions

Actions proposed to be undertaken at Lynwood Quarry during this reporting period (2023) based on the previous 2022 Annual Review are detailed in **Table 9**.

**Table 10: Actions Required from the 2023 Annual Review (Proposed by Holcim)**

Actions from Previous Annual Review	Works Undertaken	Where addressed in this Document
Complete implementation of the actions identified in the IEA Action Plan		<b>Appendix 3</b>
Implementation of approved Environmental Management Plans	All Management Plans have been implemented by Lynwood in 2023.	<b>Section 6 – Environmental Performance</b>
Engage construction of Keeping Place/cultural centre	Planning for the Cultural Heritage Centre is continuing. Lynwood Quarry is seeking EOs from contractors to construct the centre.	<b>Section 6.11</b>
Continued extraction within the Granite Pit	Extraction continued in 2023.	<b>Section 4.0 - Operations Summary</b>
Maintenance visual amenity bund to the west of the Granite Pit.	Construction of the visual amenity bund was completed in October 2022. Over 100 tubestock trees have been planted on the VAB in 2023, with 95% survival rate	<b>Section 8.0</b>

## 6.0 Environmental Performance

The following sections provide a summary of environmental monitoring and management undertaken during the report period. In accordance with the Development Consent, Lynwood Quarry has prepared several management plans in consultation with relevant stakeholders.

The environmental monitoring network is shown in **Figure 3**.

### 6.1 Summary of Performance Against EA Predictions

The Lynwood Quarry has been subject to four environmental assessments (EA) and five modifications since the original environmental impact statement and development application was approved in 2005. MOD 4 involved expanding quarrying operations to the west of the existing operations. This was assessed by the most recent EA dated November 2015 (Umwelt, 2015). The results of environmental monitoring data obtained during the report period have been compared to the predictions in the EA dated November 2015 within this Annual Review. During the report period, monitoring was undertaken at Lynwood Quarry for meteorological, noise, air quality, surface water and groundwater.

A summary of environmental performance during the report period is given in **Table 10**.

**Table 11: Summary of the environmental performance during the report period**

Aspect	Approval Criteria/ EIS Prediction	Performance during the report period	Trend / key management implications	Implemented / proposed management actions
<b>Air Quality</b> (Refer to Section 6.3)	Refer to <b>Section 6.1.1</b> <b>Section 6.3.2</b>	Non Compliance due to : <ul style="list-style-type: none"> <li>• Two PM<sub>10</sub> exceedances</li> <li>• Eight instances when monitoring not competed for 24-hour period</li> </ul>	Depositional dust and PM <sub>10</sub> monitoring results continued to trend below impact assessment criteria limits during the report period and remained within historical range.	Actions to be undertaken are detailed in <b>Section 6.3</b> .
<b>Surface Water Quality</b> (refer to Section 6.4)	Refer to <b>Section 6.1.2</b> <b>Section 6.4.2</b>	Surface Water monitoring generally complaint during the 2023 reporting period.  There was no monitoring at site SW8 throughout all of the 2023 reporting period. As no monitoring was carried out at SW8, this is non-compliant with the WMP.  Failure to notify DPHI or EPL of consecutive exceedances is also non-compliant with the WMP	Generally, surface water monitoring results were below impact assessment criteria during the report period and remained within historical range.  There were some increased levels of oil and grease in 2023 compared to 2022  Consecutive exceedances not reported to either DPHI or EPL for pH and Oil and Grease.  SW8 monitoring site was dry during the report period therefore, no samples could not be taken for all of 2023.	Actions to be undertaken are detailed in <b>Section 6.4</b>
<b>Groundwater</b> (Refer to Section 6.5)	Refer to <b>Section 6.1.3</b> <b>Section 6.5.2</b>	All Groundwater monitoring was conducted as per the WMP.  pH exceedances occurred at GPZ1 and GPZ5 during all monitoring events in 2023  Failure to notify DPHI or EPL of consecutive exceedances is also non-compliant with the WMP	Generally, groundwater results were below impact assessment criteria during the report period and remained within historical ranges.  However, exceedances occurred for some pH results. This is not a non -compliance, rather a trigger for actions.	Actions to be undertaken are detailed in <b>Section 6.5</b> .

Aspect	Approval Criteria/ EIS Prediction	Performance during the report period	Trend / key management implications	Implemented / proposed management actions
<b>Noise</b> (Refer to Section 6.6)	Refer to <b>Section 6.1.4</b> <b>Section 6.6.2</b>	Compliant with the monitoring program and criteria levels.	Noise results were below impact assessment criteria in 2023.	Any further actions to be undertaken are in <b>Section 6.6.</b>
<b>Biodiversity</b> (Refer to Section 6.7)	Refer to <b>Section 6.7.2</b> Refer to <b>Section 8.3</b>	Compliant with the monitoring program and Consent.	Rehabilitation outcomes continue to improve. Fauna monitoring was undertaken during the report period.	Any further actions to be undertaken are in <b>Section 6.7.</b>
<b>Blasting (refer to Section 6.9)</b>	Refer to <b>Section 6.9</b>	Compliant.	Blasting monitoring was undertaken in 2023 and complied with the Consent and EPL Criteria.	Any further actions to be undertaken are in <b>Section 6.9.</b>



### 6.1.1 Air Quality Predictions Against the EA

An Air Quality Impact Assessment (PEL, 2015) was completed as part of the Lynwood Quarry Extraction Area Modification EA (Umwelt, 2015). The assessment predicted that as operations move in a westerly direction, there would be no predicted exceedances of the assessment criteria for all PM<sub>10</sub> and Depositional Dust at private residences during the operational phase of the quarry. In summary, the EA concluded that:

- EPA air quality impact assessment criteria were not predicted to be exceeded at nearby residences; and
- The modification is not anticipated to cause adverse impacts offsite.

A discussion of air quality monitoring results recorded during the report period is provided in Section 6.3.

The annual depositional dust averages were below the impact assessment criteria and EA predictions for this report period. Depositional dust averages were calculated from 12 months of data.

PM<sub>10</sub> results for 2023 were similarly below impact assessment criteria and EA predictions. There were two short-term exceedances recorded during 2023. A summary of the monitoring events for PM<sub>10</sub> is presented in **Table 15**.

### 6.1.2 Surface Water Quality Predictions Against the EA

The outcomes of the surface water assessment (Umwelt 2005 & 2015) indicated that Lynwood Quarry would not significantly alter the flow regimes or annual flow volumes in the surrounding creek network in terms of peak discharges, flood levels or peak in-stream velocities either upstream or downstream of Lynwood. No adverse impacts are predicted in terms of channel stability, in-stream habitat of either Joarimin Creek or Lockyersleigh Creek systems. No adverse impacts are predicted in terms of water quality in Joarimin Creek, Lockyersleigh Creek or the downstream drainage systems.

A discussion of the surface water quality results recorded during report period is provided in **Section 7**. All surface water quality results were generally consistent with criteria. Little to low flow was observed at a number of sampling events. There was no evidence that the site caused impact to water quality downstream. Oil and Grease, and pH exceeded trigger criteria more than twice over consecutive months during 2023.

### 6.1.3 Groundwater Predictions Against the EA

Drawdown impacts are expected within the immediate vicinity of the quarry pit. As the expansion of the granite pit continues, a progressively deepening and slightly expanding cone of depression surrounding the pit is expected (Umwelt, 2015). Groundwater inflow rates are predicted to be negligible given the early stage of operations in the extension area.

Groundwater results for 2023 were generally consistent with the historical minimum and maximum bounds reaching back to 2010. Groundwater results indicated there has been no considerable impact on the local groundwater from operations. Exceedances in the maximum triggers occurred in some GPZ series bores for pH. All other parameters were compliant with the criteria outlined in the WMP. A discussion of groundwater level and water quality results is provided in **Section 7**.

#### 6.1.4 Noise Predictions Against the EA

The results of the noise impact assessment identified that noise impacts from the operations will meet the existing development consent criteria at all locations and time of day periods except receiver location 11 (Monitoring Location – N3) where a minor 1 dB exceedance is predicted at night (Umwelt, 2015).

No noise monitoring exceedances were recorded during the report period and all results remained below impact assessment criteria. A discussion of noise monitoring results recorded during the report period is provided in **Section 6.6** and all noise monitoring reports are presented in **Appendix 1**.

## 6.2 Meteorological Monitoring

A summary of monthly rainfall was retrieved from the onsite meteorological station, with the temperatures recorded from the Bureau of Meteorology (BOM) Station 070330 Goulburn Airport which is approximately 24 kilometres from site. The site uses this meteorological monitoring data to inform daily operations as per the Development Consent.

A summary of meteorological results for the report period are outlined in **Table 13**.

**Table 12: Meteorological Monitoring Results Summary 2023.**

Month	Total Rainfall (mm)	Minimum Temperature (°C)	Maximum Temperature (°C)
January	101.8	6.0	35.1
February	15.8	5.3	36.4
March	67.6	-0.3	37.6
April	70.8	0.8	23.9
May	33	-5.9	18.7
June	20	-7.4	19.0
July	9.2	-8.1	18.9
August	39.4	-4.4	17.2
September	39.8	-4.7	29.5
October	32.6	-4.7	29.6
November	92.6	-0.5	32.7
December	111.8	5.2	35.8
<b>Annual TOTAL</b>	<b>634.4</b>		

Lynwood Quarry received a total of 634.4mm of rainfall over the 2023 report period. The highest monthly rainfall occurred in December, with 111.6 mm falling during this period. The least amount of monthly rainfall occurred in July with only 9.2mm received. The minimum recorded temperature in the region occurred in July (-8.1°C), with March recording the maximum 37.6°C.

## 6.3 Air Quality

### 6.3.1 Environmental Management Measures

Lynwood's *Air Quality Management Plan* (AQMP) was revised during 2022, with document approval occurring in September 2023.

The air quality monitoring network consists of five dust deposition gauges (DD5, DD8, DD11, D12, DD13) and two High Volume Air Samplers (HVAS1 and HVAS2), which are used to measure depositional dust and particulate matter <math><10\mu\text{m}</math> (PM<sub>10</sub>), respectively. Dust monitoring locations are provided in **Figure 3**.

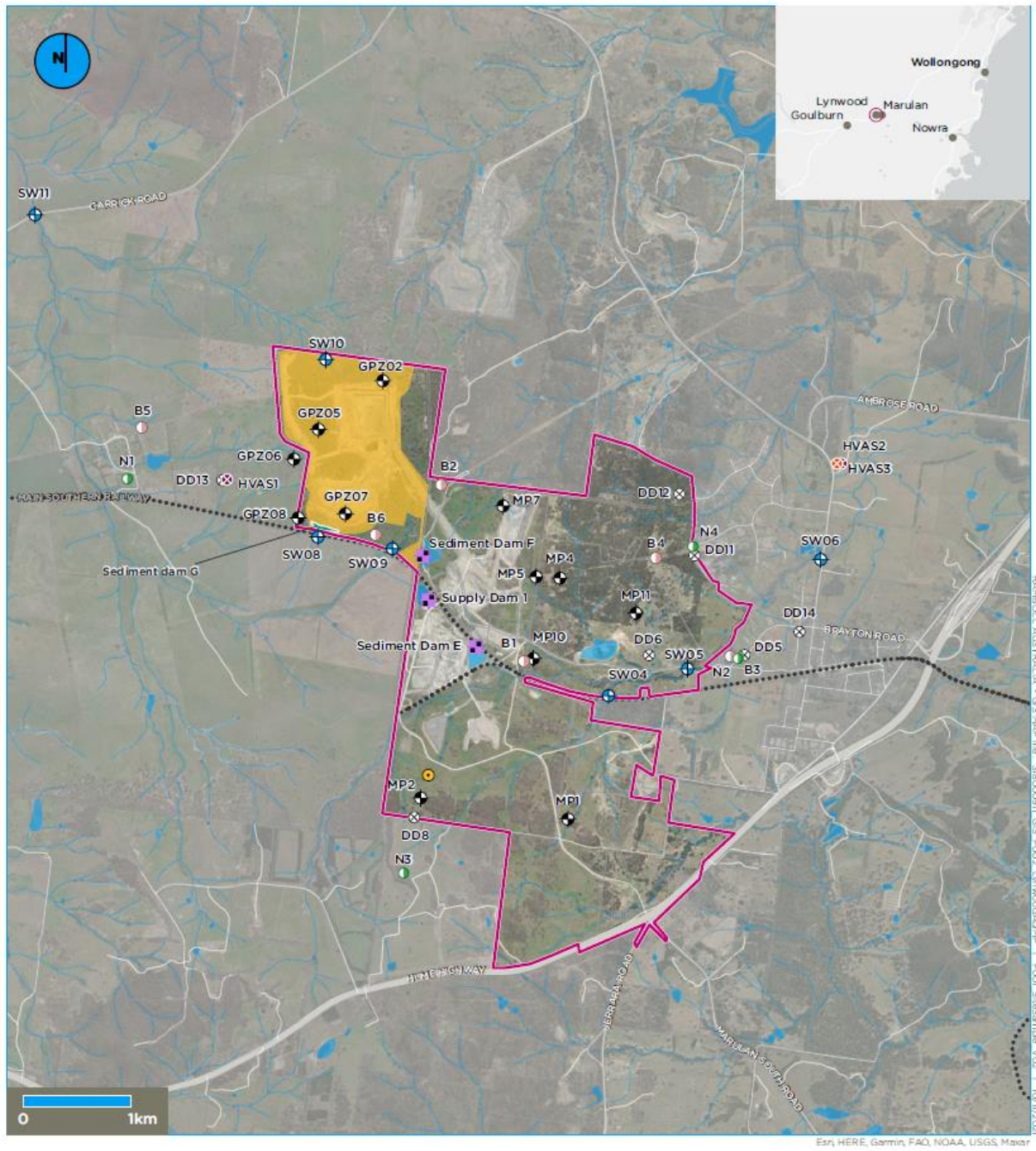
Lynwood trialled the use of an automatic water spray system in the site production area in 2021. The automatic water sprays were purposed as a dust suppression system. The automatic system continues to be used as an effective dust mitigation measure.

### 6.3.2 Performance Criteria

Holcim is required to ensure that dust and particulate emissions do not cause exceedances of the criteria specified in the Development Consent. The air quality assessment criteria specified in the Development Consent are provided in **Table 14**.

**Table 13: Air quality impact assessment criteria**

Pollutant	Averaging Period	Criterion
Total suspended particulate (TSP) matter	Annual average	90 $\mu\text{g}/\text{m}^3$
Particulate matter <math><10\mu\text{m}</math> (PM <sub>10</sub> )	Annual average	30 $\mu\text{g}/\text{m}^3$
	24 hour average	50 $\mu\text{g}/\text{m}^3$
Deposited dust	Annual average (maximum total)	4 $\text{g}/\text{m}^2/\text{month}$
	Annual average (maximum increase)	2 $\text{g}/\text{m}^2/\text{month}$



**Legend**

- Approved project area
- Granite pit disturbance footprint
- Cadastral boundary (NSW Spatial Service, 2021)
- Waterway (NSW Spatial Service, 2021)
- + Marulan Childrens Centre
- + Marulan Public School
- + Residence location
- + Meteorological station
- + Blasting monitoring location
- + Noise monitoring location

**Sample locations**

- ⊗ Dust deposition sample location
- ⊗ HVAS PM2.5 sample location
- ⊗ HVAS PM10 sample location
- + Dam sample location
- + Surface water sample location
- + Groundwater sample location

**A4**  
1:50,000

**Figure 1 : Site layout and sample locations**

## 6.3.3 Environmental Outcomes

### 6.3.3.1 Depositional Dust

As noted in **Table 14**, depositional dust monitoring during the report period took place on a monthly basis. All of the sampling sites were compliant with Development Consent criteria for annual average total deposited dust and ranged between 0.5 – 0.9 g/m<sup>2</sup>/month. It should be noted that on approval of the AQMP (2023) that DD6 became an internal comparison point monitor and is not used to measure offsite air quality nor is it intended for reporting as part of the monitoring network. As such, any exceedances recorded at DD6 do not need to be notified to the Department.

Throughout the reporting period, the site was compliant with the annual average all recording below 1.0 g/m<sup>2</sup>/month. The highest reading during the reporting period was 3.7 g/m<sup>2</sup>/month.

**Table 14: 2023 Depositional Dust Monitoring Results.**

Month	Total Insoluble Solids (g/m <sup>2</sup> /month)						
	DD5	DD6	DD8	DD11	DD12	DD13	DD14
January	1.2	0.2	0.2	0.6	0.3	0.7	0.6
February	0.3	3.1	0.3	0.3	0.2	1.4	0.3
March	0.5	5.4	0.4	1.0	0.5	0.8	0.9
April	0.6	14	0.5	0.5	0.2	0.5	0.4
May	3.7	3.7	1.1	0.1	0.3	0.1	0.1
June	1.8	5	0.5	0.8	0.3	0.2	0.4
July	0.1	0.5	0.2	0.1	0.2	0.1	0.1
August	0.2	6.5	0.5	0.2	0.1	0.6	1.3
September	0.4	2.2	0.6	0.2	0.2	0.6	0.3
October	0.4	1	0.4	1.0	0.5	0.8	0.3
November	0.5	0.2	1.1	0.2	0.3	0.8	0.4
December	0.6	0.4	1.8	1.0	0.5	3.1	0.8
Annual Average	0.9	3.5	0.6	0.5	0.3	0.8	0.5
Minimum	0.1	0.2	0.2	0.1	0.1	0.1	0.1
Maximum	3.7	6.5	1.8	1.0	0.5	3.1	1.3

Note: Contaminated samples are marked with an asterisk (\*) and have been removed from the annual average. NS indicates where a sample was invalidated due to contamination.

### 6.3.3.2 PM<sub>10</sub>/ TSP

PM<sub>10</sub> monitoring via HVAS units 1 (Lockyersleigh) and 2 (Brayton Road) was undertaken during the report period. There were 59 sampling events at HVAS 1 and t HVAS 2 in the report period, as shown in **Table 15**.

**Table 15: 2023 PM<sub>10</sub> Compliance Summary**

Category	HVAS 1	HVAS 2
Total number of HVAS monitoring rounds required in 2023	59	59
Number of completed monitoring rounds	50	57
Number of incomplete monitoring rounds, contamination, or equipment failure.	9	2
Number of valid samples	50	58

During the 2023 reporting period, 11 non-compliance were recorded at Lynwood Quarry. Of these, there were two (2) instances of the HVAS exceeded the short term 24-hour average criteria of 50 µg/m<sup>3</sup>, recording 63.4 PM<sub>10</sub> on February 24, and 58.4 PM<sub>10</sub> on April 25. There were an additional nine (9) recorded instances where the HVAS did not operate for the required 24 hour period, as detailed in **Table 16**.

**Table 16: Summary of Non-Compliant or Invalid PM<sub>10</sub> Monitoring Results**

Date	PM <sub>10</sub> (µg/m <sup>3</sup> )	Cause
<b>HVAS1</b>		
April 25, 2023	58.4	Crop plantation in the area and all around the HVAS1 is believed to have contributed to PM <sub>10</sub> exceedance
May 13, 2023	9.2	HVAS ran for 23 hours of required 24 hours.
July 6, 2023	NS	HVAS ran for 23 hours of required 24 hours.
August 11, 2023	4.4	HVAS ran for 22 hours of required 24 hours.
August 17, 2023	3.4	HVAS ran for 19 hours of required 24 hours.
August 23, 2023	1.8	HVAS ran for 17 hours of required hours.
September 16, 2023	NS	HVAS did not run. Issue was recorded.
September 22, 2023	NS	HVAS did not run. Issue was recorded.
October 4, 2023	38.1	HVAS ran for 17 hours of required 24 hours.
<b>HVAS2</b>		
February 24, 2023	63.4	Earthworks and topsoil stripping occurred at landowners property (HVAS2 location) during sampling period.
May 7, 2023	4.1	HVAS ran for 48 hours.

**Table 17** display the PM<sub>10</sub> monitoring results at HVAS 1 and HVAS 2, respectively.

**Table 17: HVAS 2023 PM<sub>10</sub> Monitoring Results**

Sampling Date	HVAS 1 (Lockyersleigh)			HVAS 2 (Brayton Road)		
	PM <sub>10</sub>	TSP <sup>5</sup>	Compliance Status	PM <sub>10</sub>	TSP	Compliance Status
1/1/2023	9.4	15.604	Compliant	10	16.6	Compliant
7/1/2023	5.3	8.798	Compliant	8.1	13.446	Compliant
13/1/2023	12.4	20.584	Compliant	15.1	25.066	Compliant
19/1/2023	6.2	10.292	Compliant	7.4	12.284	Compliant
25/1/2023	21.4	35.524	Compliant	15.4	25.564	Compliant
31/1/2023	6.1	10.126	Compliant	9.2	15.272	Compliant
3/2/2023	11.7	19.422	Compliant	10.4	17.264	Compliant
6/2/2023	13.2	21.912	Compliant	22.2	36.852	Compliant
12/2/2023	16.8	27.888	Compliant	19.7	32.702	Compliant
18/2/2023	15.5	25.73	Compliant	24.2	40.172	Compliant
24/2/2023	10.1	16.766	Compliant	<b>63.4</b>	<b>105.244</b>	<b>Non-Compliant</b>
2/3/2023	26.1	43.3	Compliant	29.2	48.4	Compliant
8/3/2023	18.1	30.046	Compliant	22.1	36.686	Compliant
14/3/2023	6.3	10.458	Compliant	5.9	9.794	Compliant
20/3/2023	11.1	18.426	Compliant	13.7	22.742	Compliant
26/3/23	7.9	13.114	Compliant	10	16.6	Compliant
1/4/2023	8.6	14.276	Compliant	10.5	17.43	Compliant
7/4/2023	6.2	10.292	Compliant	8.8	14.608	Compliant
13/4/2023	5.5	9.13	Compliant	6.6	10.956	Compliant
19/4/2023	10.1	16.766	Compliant	12.4	20.584	Compliant
25/4/2023	<b>58.4</b>	<b>96.944</b>	<b>Non-Compliant</b>	10.6	17.596	Compliant
1/5/2023	3	4.98	Compliant	4.3	7.138	Compliant
7/5/2023	3.6	5.976	Compliant	<b>4.1<sup>1</sup></b>	<b>6.806</b>	<b>Non-Compliant</b>
13/5/2023	<b>9.2<sup>4</sup></b>	<b>15.272</b>	<b>Non-Compliant</b>	19.7	32.702	Compliant
19/5/2023	5.9	9.794	Compliant	12.2	20.252	Compliant
25/5/2023	13.7	22.742	Compliant	30.7	50.962	Compliant



Sampling Date	HVAS 1 (Lockyersleigh)			HVAS 2 (Brayton Road)		
	PM <sub>10</sub>	TSP <sup>5</sup>	Compliance Status	PM <sub>10</sub>	TSP	Compliance Status
31/5/2023	2.4	3.984	Compliant	5.6	9.296	Compliant
6/6/2023	5.2	8.632	Compliant	7.7	12.782	Compliant
12/6/2023	5.5	9.13	Compliant	9.6	15.936	Compliant
18/6/2023	3.7	6.142	Compliant	4.1	6.806	Compliant
24/6/2023	1.7	2.822	Compliant	2.8	4.648	Compliant
30/6/2023	1.3	2.158	Compliant	2.2	3.652	Compliant
6/7/2023	NA	NA	Non-Compliant	6.2	10.292	Compliant
12/7/2023	2.9	4.814	Compliant	24	39.84	Compliant
18/7/2023	7	11.62	Compliant	5.5	9.13	Compliant
24/7/23	6.6	10.956	Compliant	13.6	22.576	Compliant
30/7/2023	5.2	8.632	Compliant	3.1	5.146	Compliant
5/8/2023	5.3	8.798	Compliant	7.7	12.782	Compliant
11/8/2023	4.4 <sup>3</sup>	7.304	Non-Compliant	7.7	12.782	Compliant
17/8/2023	3.4 <sup>3</sup>	5.644	Non-Compliant	17.1	28.386	Compliant
23/8/2023	1.8 <sup>3</sup>	2.988	Non-Compliant	7.5	12.45	Compliant
29/8/2023	7.6	12.616	Compliant	12.4	20.584	Compliant
4/9/2023	11.2	18.592	Compliant	11.6	19.256	Compliant
10/9/2023	5	8.3	Compliant	25	41.5	Compliant
16/9/2023	NA	NA	Non-Compliant	14.5	24.07	Compliant
22/9/2023	NA	NA	Non-Compliant	5.2	8.632	Compliant
28/9/2023	42.6	70.716	Compliant	7.1	11.786	Compliant
4/10/2023	38.1 <sup>4</sup>	63.246	Non-Compliant	6.8	11.288	Compliant
10/10/2023	10.6	17.596	Compliant	8.3	13.778	Compliant
16/10/2023	2.9	4.814	Compliant	3.9	6.474	Compliant
22/10/2023	11.2	18.592	Compliant	10.1	16.766	Compliant
28/10/2023	6.1	10.126	Compliant	5	8.3	Compliant
3/11/2023	43.3	71.878	Compliant	8.4	13.944	Compliant
8/11/2023	11.7	19.422	Compliant	15.3	25.398	Compliant

Sampling Date	HVAS 1 (Lockyersleigh)			HVAS 2 (Brayton Road)		
	PM <sub>10</sub>	TSP <sup>5</sup>	Compliance Status	PM <sub>10</sub>	TSP	Compliance Status
14/11/2023	16.9	28.054	Compliant	20.6	34.196	Compliant
16/11/2023	17.5	29.05	Compliant	9.9	16.434	Compliant
23/11/2023	18.5	30.71	Compliant	13.9	23.074	Compliant
30/11/2023	10.2	16.932	Compliant	9.6	15.936	Compliant
03/12/2023	10.2	16.932	Compliant	9.6	15.936	Compliant
09/12/2023	10.2	16.932	Compliant	15.9	26.394	Compliant
15/12/2023	17.3	28.718	Compliant	14.8	24.568	Compliant
21/12/2023	11	18.26	Compliant	9.9	16.434	Compliant
27/12/2023	7.8	12.948	Compliant	6.9	11.454	Compliant
<b>Annual Average</b>	<b>10.99</b>	<b>18.25</b>	<b>Compliant</b>	<b>11.8</b>	<b>19.4</b>	<b>Compliant</b>
<b>Minimum</b>	<b>1.3</b>	<b>0</b>	<b>Compliant</b>	<b>0</b>	<b>2.2</b>	<b>Compliant</b>
<b>Maximum</b>	<b>58.4</b>	<b>96.944</b>	<b>Non-Compliant</b>	<b>63.4</b>	<b>105.244</b>	<b>Non-Compliant</b>

Note: Samples impacted by contamination or damaged equipment are marked with an asterisk (\*). NS indicates the result could not be retrieved

Note<sup>1</sup>: HVAS2 ran for 48 hours.

Note<sup>2</sup>: Filter paper was lot. HVAS1 ran for 23 hours due to low battery supply.

Note<sup>3</sup>: HVAS1 recorded three power outages on these dates and did not run for the required minimum of 23 hours in the 24-hour sampling period, resulting in sampling failure

Note<sup>4</sup>: HVAS did not operate for the required 24 hours.

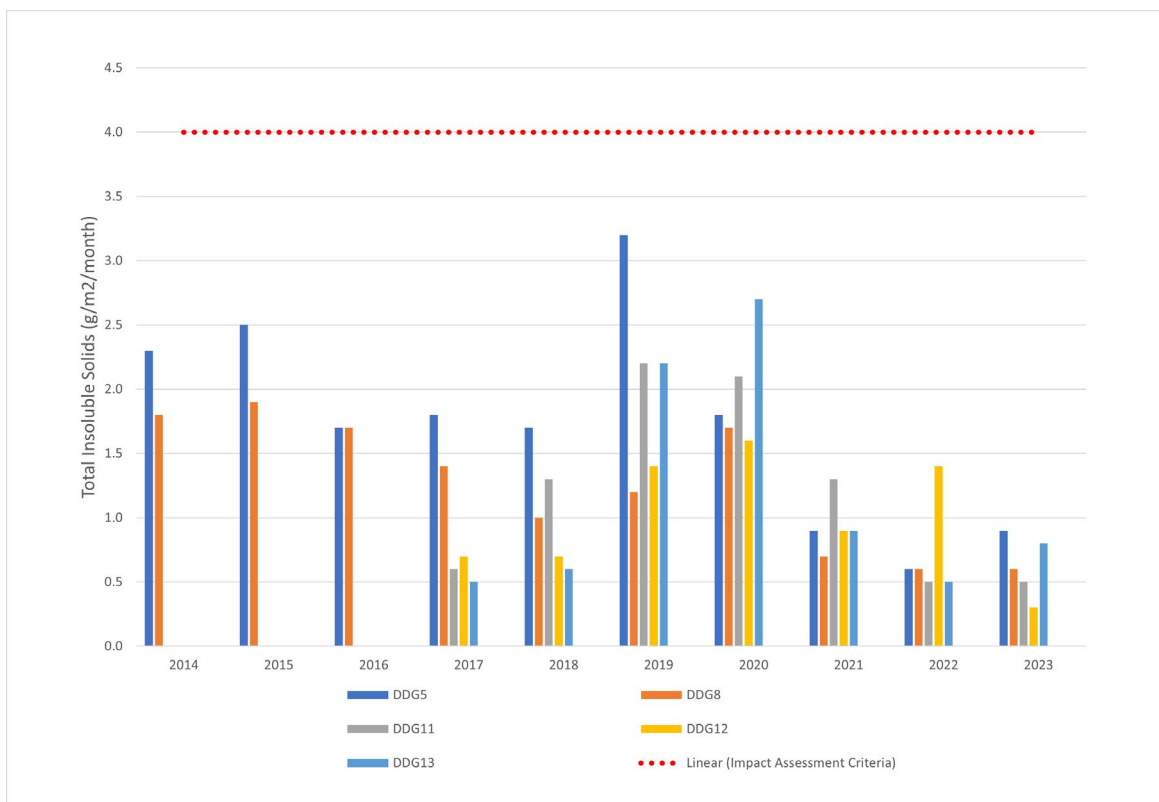
Note<sup>5</sup>: TSP calculated off PM<sub>10</sub> results. This was approved in 2010 by DPHI as part of the EMP (Umwelt, 2010)

## 6.3.4 Trends in data

### 6.3.4.1 Depositional Dust

A summary of annual average monitoring results from 2014 to 2023 is provided in Figure 3. Gauges DD11, DD12 and DD13 were installed in December 2016 following a revision to the depositional dust monitoring network and the approval of the Development Consent (Mod 4). As a result, limited data is available to compare against historical operations. Gauges DD5 and DD8 provide a longer-term comparison of monitoring results.

As shown in **Figure 4**, a comparison of depositional dust monitoring results indicates all sites were compliant with the development consent against maximum allowable annual increase criteria. Depositional dust results continue to be below the impact assessment criteria of  $4(\text{g}/\text{m}^2/\text{month})$  at all sites. All gauges decreased in annual average from 2021, with the exception of DDG12 which has a slight increase. Results are generally lower than previous years.

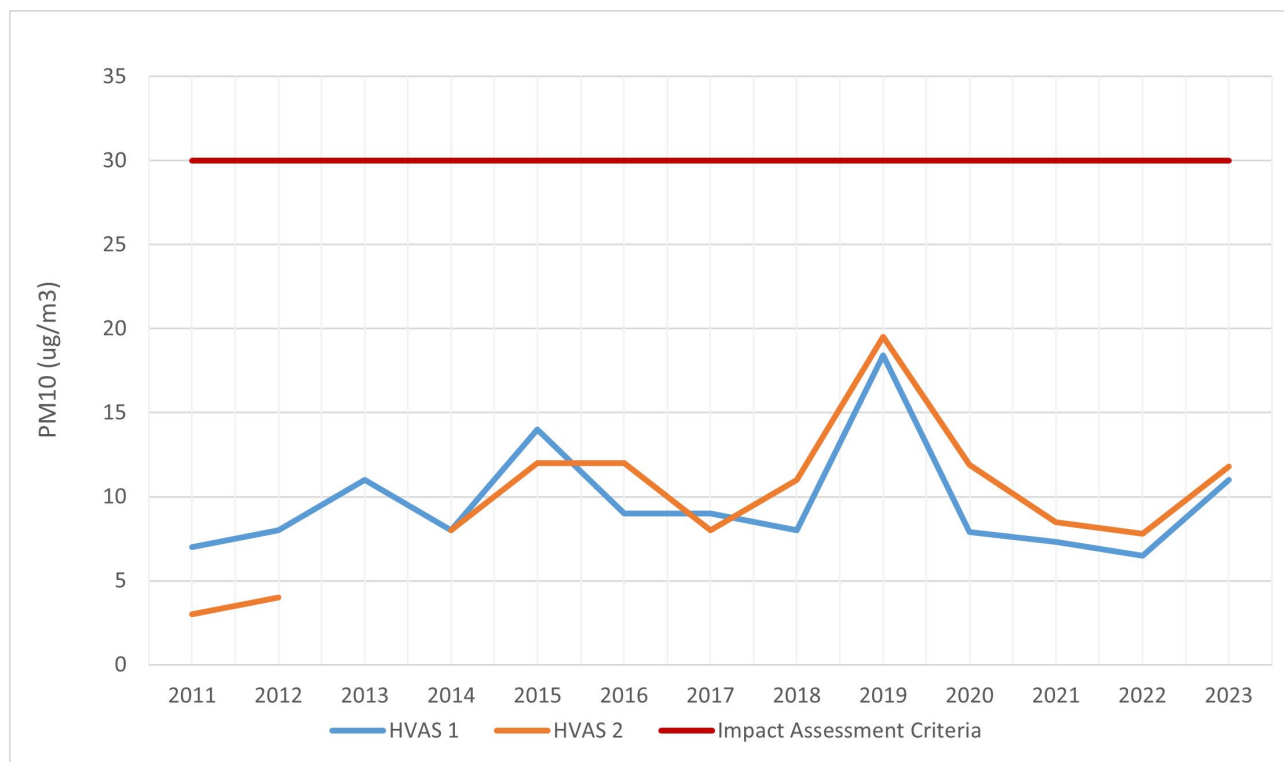


**Figure 5: Historical Depositional Dust Monitoring**

### 6.3.4.2 PM<sub>10</sub>

Annual average PM<sub>10</sub> monitoring results from this report period to 2011 are provided in **Figure 5**. All results are below the annual average impact assessment criteria. As seen in Figure 5, a gap in data occurs in 2013 for HVAS 2 as a result of the unit not recording the required number of samples due to power supply issues.

The 2023 annual averages at HVAS 1 and HVAS 2 were 10.99 µg/m<sup>3</sup> and 11.8 µg/m<sup>3</sup> respectively. Annual averages at HVAS 1 and HVAS 2 in 2019 are higher than all other years represented. High 2019 results were attributed to excessive dust generated by drought conditions and particulate matter from heavy bushfire smoke. 2020, 2021 and 2022 results are more consistent with levels seen prior to 2019.



**Figure 6: Historical PM<sub>10</sub> Monitoring Results**

### 6.3.5 Incident Notification

Holcim notified the Department of all non-recorded samples during the 2023 reporting period

### 6.3.6 Proposed Improvements for the Next Report Period

In 2022 Lynwood trailed a fog cannon machine for dust suppression, with this trial continuing into 2023.

Lynwood will continue progressing towards assessing the automated haul Road dust control spray system in 2024.

## 6.4 Surface Water

### 6.4.1 Environmental Management Measures

Lynwood has developed and implemented a Surface Water Monitoring Program in accordance with the requirements of the Development Consent. The overall Water Management Plan (including component plans) was revised in 2020, with DPHI approving the WMP on 16 November 2020. This includes a revision of trigger levels which have been outlined in this Annual Review.

The SWMP provides details on:

- Baseline water quality data;
- Surface water impact criteria;
- Monitoring surface water flow and quality;
- Surface water impact trigger levels and management actions; and
- Erosion and sediment controls implemented onsite.

Surface water management infrastructure at the Quarry was established during the initial construction and operational phase of the Quarry. The water management system includes a series of clean water diversion drains, catch drains and sedimentation dams. These structures have been constructed to minimise the interaction between clean and dirty water and to provide controls to treat captured dirty water to a standard acceptable for discharge off-site.

As of September 2021, on the approval of the Riparian Management Plan for Joarimin Creek Catchment Area, quarterly inspections of Joarimin Creek undertaken by Holcim staff commenced. The riparian quality inspections assess sediment and erosion controls, creek stability, and riparian zone conditions.

### 6.4.2 Performance Criteria

#### 6.4.2.1 Surface Water Monitoring Criteria/Trigger Levels

Trigger levels are provided in the 2020 Water Management Plan within the Surface Water Monitoring Program. These trigger levels are outlined in **Table 20** and have been based on an extended period of monitoring data from Lynwood surface water (SW) locations.

**Table 18: Trigger Values for Key Water Parameters – from Surface Water Management Plan (2020)**

Water Quality	Trigger Value			
Variable	<sup>3</sup> SW 1 and 2 (Marulan Creek) SW 3 and 4 Joarimin Creek SW 7 Lockyersleigh Creek	Joarimin Creek (SW4-SW6)	SW8 to SW11	<sup>4</sup> Site Water Management System Dams (excluding SW5, SW6 and SW8 to SW11)
pH	No longer monitored. No trigger levels proposed.	5.3 to 9.7	6.4 to 7.8	6.5 to 8.5 <sup>1</sup>
Electrical Conductivity		Maximum of 3255 µS/cm	Maximum of 3922 µS/cm	No criteria listed in the Development Consent. No trigger levels proposed.
Oil and Grease		10 mg/L or nonvisible	10 mg/L or nonvisible	10 mg/L or nonvisible <sup>1</sup>
Total Suspended Solids		Less than 320 mg/L	Less than 320 mg/L <sup>2</sup>	50 mg/L <sup>1</sup>

**Notes:**

<sup>1</sup> Triggers marked with <sup>1</sup> are from Schedule 3 Condition 17;

<sup>2</sup> For SW8 to 11 there has been very few samples obtained. The highest TSS level recorded across a total of four sampling events has been low (16 mg/L). Holcim have therefore used the Joarimin Creek TSS range for the TSS trigger value for SW8 to 11.

<sup>3</sup> SW1 – 3 are no longer monitored, hence there are no proposed criteria. SW7 is also no longer monitored.

<sup>4</sup> Criteria associated with site water dams are only applicable during discharge events offsite from these dams (controlled discharge dams).

### 6.4.3 Environmental Outcomes

There were no discharges from Lynwood Quarry during the report period. During discharge, surface water quality sampling is undertaken at Sediment Dam E, Sediment Dam F, and Supply Dam 1 in addition to the required monitoring points presented below.

#### Surface Water Monitoring Program

Lynwood is required to conduct surface water monitoring across the site on a monthly basis at monitoring locations consistent with those shown in **Figure 3**. Surface water monitoring records captured during the report period are provided in a summary provided in **Table 19**. Surface water monitoring is undertaken when an appropriate volume of water is available to enable a representative sample to be obtained.

**Table 19: Summary of Results – Surface Water 2023**

Site	EC (µs/cm)			pH			TSS (mg/L)			Oil & Grease (mg/L)			P (mg/L)			N (mg/L)			Flow
	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	
Sediment Dam E	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	No Flow
Sediment Dam F	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	No Flow
Sediment Dam G1	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	No Flow
Supply Dam	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	No Flow
SW4	293	1483	<b>3570</b>	<b>3.5</b>	6.9	8.3	5.1	17.2	40	5	7.9	<b>17</b>	0.01	0.01	0.05	0.2	0.7	3	Flow (12)
SW5	374	1626	<b>5130</b>	7	8	9	5	9.5	26	5	<b>11.4</b>	<b>25</b>	0.01	0.01	0.03	0.2	1.04	4.2	Flow (12)
SW6	286	1148	<b>5131</b>	6.9	8.1	9.1	5	41	250	5	8.7	<b>18</b>	0.01	0.02	0.06	0.2	1.26	5	Flow (12)
SW8 <sup>1</sup>	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	No Flow
SW9	427	1887	<b>6420</b>	7	8	<b>9</b>	12	342.7	<b>1400</b>	5	8.5	<b>26</b>	0.01	0.2	0.64	0.2	6.8	43.9	Flow (11)
SW10	288	1150	<b>6040</b>	7.3	8.1	<b>8.9</b>	11	51.1	210	5	7.3	<b>16</b>	0.01	0.08	0.38	0.2	1	2.49	Flow (10)
SW11	726	1604	2810	7.1	7.8	<b>9.3</b>	5	11.8	31	5	6.8	<b>16</b>	0.01	0.05	0.35	0.2	0.99	2.3	Flow (12)

Note: Minimum and maximum values which are below or above the trigger values are in **bold**.

Note<sup>1</sup> – Sediment and Supply Dams did not discharge during 2023 reporting period.

Note<sup>2</sup>- SW8 was dry for 2023 reporting period



**Table 20 - Yearly Comparison of Average Surface Water Results**

Site	2023				2022				2021			
	EC (µs/cm)	pH	TSS (mg/L)	Oil & Grease (mg/L)	EC (µs/cm)	pH	TSS (mg/L)	Oil & Grease (mg/L)	EC (µs/cm)	pH	TSS (mg/L)	Oil & Grease (mg/L)
<b>Sediment Dam E</b>	Dry	Dry	Dry	Dry	399.4	8.6	124.8	7.3	553.4	9.0	88.7	6.7
<b>Sediment Dam F</b>	Dry	Dry	Dry	Dry	438.2	8.3	28.2	10.7	608.3	8.7	10.1	5.8
<b>Sediment Dam G1</b>	Dry	Dry	Dry	Dry	920.2	9	11.9	9.7	671.5	9.0	18.4	6.0
<b>Supply Dam</b>	Dry	Dry	Dry	Dry	399.7	8.7	13.2	8.5	571.5	9.0	10.6	6.4
<b>SW4</b>	1483	6.9	17.2	7.9	251.3	7.3	19.9	8.2	595.4	6.6	29.8	7.9
<b>SW5</b>	1626	8.0	9.5	<b>11.4</b>	397.6	7.8	8.4	7.5	754.3	7.5	9.7	5.7
<b>SW6</b>	1148	8.1	41	8.7	373.5	7.4	11.5	<b>11.4</b>	640.9	7.3	9.1	6.5
<b>SW8<sup>1</sup></b>	Dry	Dry	Dry	Dry	NS	NS	NS	NS	NS	NS	NS	NS
<b>SW9</b>	1887	8.25	265.7	<b>10.2</b>	632.1	8	135.3	13.1	1091.8	7.4	64.7	6.0
<b>SW10</b>	1150	8.1	51.1	7.3	448.3	7.3	190.4	10.4	2750.3	7.0	118.4	6.8
<b>SW11</b>	1604	7.8	11.8	6.8	1106.3	7.5	7.7	9.2	2717.2	7.5	36.4	6.2

No evidence was found during the site visit or data analysis to suggest Holcim operations were generating oil and grease impacts. As there were no discharges during the reporting period, Lynwood believes that these exceedances originate offsite. Lynwood also note that SW6 monitoring location is within close proximity to a road and bridge drain into Joarimin Creek.

Comparing the average results from the 2023 reporting period, pH has slightly increased for all sites since 2021 as outlined in **Table 20**. Comparing the average results from 2023 till 2021, Electrical Conductivity has also increased during this time, however there is no evidence to suggest that this is caused by Holcim. Oil and Grease has remained fairly consistent over this same period.

#### **SW4**

A summary of SW4 monitoring results is provided in **Table 19**. Surface water results were generally compliant in 2023.

In September a pH of 3.5 was recorded below the lower limit of pH 5.3, and Oil and Grease at SW4 recorded three exceedances in February, March, and June, recording 15, 11, and 17 respectively, however oil and grease was not visible. This is an exceedance in the trigger levels outlined in the Surface Water Monitoring Program and **Table 18**. Lynwood believes that the oil and grease exceedances reported in SW4 originate offsite, as no discharges occurred during these time periods, and site investigations revealed no evidence. As Holcim failed to notify the Department or EPL of these consecutive exceedances, this is an administration non-compliance.

The average nitrogen result for 2023 was 0.7 mg/L, which is lower when compared to the previous year 2022 (1.3mg/L).

#### **SW5**

A summary of SW5 monitoring results is provided in **Table 19**. Surface water results were generally compliant in 2023. Monthly monitoring at SW5 found pH, electrical conductivity, and total suspended solids levels were within trigger values, with the exception of one exceedance in April for electrical conductivity which recorded 5130  $\mu\text{S}/\text{cm}$ , above the limit of 3255  $\mu\text{S}/\text{cm}$ .

The pH at SW5 ranged from a minimum of 7.0 in June to a maximum of 9.0 in July 2023. pH did not exceed the trigger levels outline in Table 18.

During the 2023 reporting period, SW 5 recorded five (5) exceedances of Oil and Grease in February (17mg/L), March (25mg/L), May (17mg/L), June (15mg/L), and October (15mg/L) however no Oil or Grease were noted as being visible during these times. As Holcim failed to notify the Department or EPL of these consecutive exceedances, this is an administration non-compliance. However, it is noted that no evidence to suggest that the development was the cause of the oil and grease exceedances in Joarimin Creek.

Phosphorous levels did not differ from historical trends. Nitrogen had a maximum recording of 4.2mg/L, however annual average was still lower than 2022 average.

## **SW6**

A summary of SW6 monitoring results is provided in **Table 19**. Monitoring was undertaken on 12 occasions during the report period.

The pH results were within the minimum and maximum trigger values for Joarimin Creek and consistent with long-term results, as was the total suspended solids which were within trigger levels. In April, SW 6 recorded an exceedance in electrical conductivity of 5131  $\mu\text{S}/\text{cm}$ .

Oil and grease for June and October was not visible, but was measured to be 15mg/L, and 18mg/L. This is an exceedance of the total oil and grease trigger, 10 mg/L. The oil and grease exceedances in SW6 are likely to be influenced by the sample location's proximity to a road and bridge drain into Joarimin Creek.

Average nitrogen and phosphorous levels were within long-term trends for SW6.

## **SW8**

During 2023 no sampling was recorded for SW8, as the sample location was too dry for all twelve occasions.

## **SW9**

A summary of SW9 monitoring results is provided in **Table 19**. Monitoring was undertaken on 11 occasions in 2023, with November being reported as dry, with no sampling occurring.

The SW9 annual average pH is 8.25 which exceeds the maximum trigger of 7.8. The pH results exceeded the maximum trigger level in eight occasions which occurred during February, March, April, June, July, August, December, and in October which showed the maximum pH of 9.0. As Holcim failed to notify the Department or EPL of these consecutive exceedances, this is an administration non-compliance.

There was one exceedance for Electrical conductivity in April, recording 6420  $\mu\text{S}/\text{cm}$  and three exceedances of total suspended solids in January, July, and September recording 910  $\mu\text{S}/\text{cm}$ , 810  $\mu\text{S}/\text{cm}$ , and 1400  $\mu\text{S}/\text{cm}$  respectively.

The maximum total oil and grease was 26mg/L which was recorded in April, and an annual average of 10.21 mg/L was recorded. Oil and grease were not visible for 11 occasion.

Phosphorus levels remained consistent with long-term data trends. In February, a total nitrogen of 43.9 mg/L was recorded, the annual average was 6.8 mg/L.

## **SW10**

A summary of SW10 monitoring results is provided in **Table 19**. Monitoring was undertaken on 10 occasions in 2023, with November and December being reported as dry, with no sampling occurring.

In 2023, there were six exceedances in pH recorded at SW10 in March, April, June, July, August, and October, with July recording the highest reading with pH 8.9. As Holcim failed to notify the Department or EPL of these consecutive exceedances, this is an administration non-compliance.

There were one exceedances for Electrical conductivity recording 6040  $\mu\text{S}/\text{cm}$  in April. All total suspended solids sampling in 2023 was within criteria.

Total oil and grease exceeded the trigger level 10 mg/L on two occasions, recording 13 mg/L in January, and 16mg/L in April. Oil and Grease was not visible on the surface on either of these occasions.

Phosphorous and nitrogen levels were consistent with previous years trends.

### **SW11**

A summary of SW11 monitoring results is provided in **Table 19**.

Monthly monitoring at SW11 found all TSS and EC results were within the trigger levels.

During the reporting period, there was six exceedances in pH, which occurred in January, April, June, July, August, and October with August recording the highest pH of 9.3, with the other months recording a pH level between 7.9-8.2. As Holcim failed to notify the Department or EPL of these consecutive exceedances, this is an administration non-compliance.

There was two recorded exceedances of Oil and Grease during the reporting period, with February recording 11mg/L and 16mg/L in April. During the February sampling period, Oil and Grease was visible.

Nitrogen and phosphorous maximums and annual averages in 2023 were lower than those seen in 2022 and were more consistent with previous levels.

### **6.4.4 Trends in Data**

Oil and grease levels exceeded the trigger levels a number of times in 2023 at both Joarimin and Lockyersleigh Creek locations. Oil and grease results from the previous reporting periods noted that the parameter had increased compared to 2018 results. The exceedances in the trigger levels were identified by Holcim however no incident was recorded by the Department. In the 2022 reporting period the Department noted that no evidence was found to suggest that the development was the cause of the oil and grease exceedances.

Electrical conductivity and total suspended solids were generally consistent with long-term results. 2023 pH results generally consistent with long-term results.

### **6.4.5 Proposed Improvements**

Holcim propose to continue to monitor the oil and grease levels across Joarimin Creek and Lockyersleigh Creek sampling locations to identify any emerging trends. Holcim will continue to monitor unusual monitoring results and investigate exceedances in 2024 relating to pH and Oil and Grease

There were no additional surface water improvements identified in this report period. Holcim will continue to compare results against longer term trends and trigger levels from the WMP.

## 6.5 Groundwater

### 6.5.1 Environmental Management Measures

The Lynwood Quarry Water Management Plan (WMP) was revised and approved by DPHI in 2020. This 2020 WMP includes a revision of trigger levels which are used in this annual review. Lynwood has developed and implemented a Groundwater Monitoring Program (GMP) in accordance with the requirements of the Development Consent.

The GMP provides details on:

- Baseline water quality;
- Groundwater Impact Criteria;
- Monitoring regional groundwater level and quality; and
- Groundwater impact trigger levels and management actions.

The groundwater water management system includes a series of piezometers and groundwater monitoring bores.

### 6.5.2 Performance Criteria

#### 6.5.2.1 Groundwater Inflow and Level Monitoring

As outlined in the Water Management Plan (2020) and Groundwater Monitoring Program, groundwater level monitoring will be reviewed against long-term monitoring trends and further compared against drawdowns predicted within the Lynwood Quarry EIS (Umwelt, 2005) and Modification EA (Umwelt, 2015). Triggers for groundwater depth are shown in **Table 21**.

#### 6.5.2.2 Groundwater Quality Monitoring Criteria/Trigger Levels

Trigger levels have been updated in the 2020 WMP and are included in **Table 21**. These new trigger levels are based on an extended period of monitoring data from Lynwood GW locations.

Groundwater monitoring is required to occur quarterly.

**Table 21: Groundwater Monitoring Criteria (WMP, 2020)**

Parameter	Minimum Trigger	Maximum Trigger	General comment
<b>MP Bores</b>			
Depth to groundwater (metres)	1.64	28.05	This was the minimum and maximum levels since regular monitoring commenced in 2010
EC (µS/cm)	No minimum trigger required	11,521	This was the highest EC reading since monitoring commenced for the MP bores.
pH	4.2	9.5	These were the highest and lowest pH readings since monitoring commenced for the MP bores.
Sulphate (mg/L)	No minimum trigger required	152	This was the maximum level recorded since monitoring commenced for sulphate.
Total Nitrogen (mg/L)	No minimum trigger required	2.20	This was the maximum level recorded since monitoring commenced for total nitrogen.
Total Phosphorus(mg/L)	No minimum trigger required	3.02	This was the maximum levels recorded since monitoring commenced for total phosphorus.
<b>GPZ Bores</b>			
Depth to groundwater (metres)	2.13	23.9	This was the minimum and maximum levels since regular monitoring commenced of GPZ bores in April 2017.
EC (µS/cm)	No minimum trigger	8,020	This was the highest EC reading since monitoring commenced for the GPZ bores.
pH	6.1	7.8	These were the highest and lowest pH readings since monitoring commenced for the GPZ bores.
Sulphate (mg/L)	No minimum trigger required	76	This was the maximum levels recorded since monitoring commenced for the GPZ bores.
Total Nitrogen (mg/L)	No minimum trigger required	5.0	This was the maximum levels recorded since monitoring commenced for the GPZ bores.
Total Phosphorus (mg/L)	No minimum trigger required	1.20	This was the maximum levels recorded since monitoring commenced for the GPZ bores.

### 6.5.3 Environmental Trends and Outcomes

Lynwood conducts groundwater monitoring via a network of monitoring bores across site on a quarterly basis. A summary of groundwater monitoring results is provided in **Table 22**. Further monitoring results are presented in **Appendix 2**.

Monitoring was undertaken at the required frequency for all monitoring bore sites with the exception of GPZ2 at which monitoring ceased after Quarter 2 of 2020 due to the extension of the pit over this area.

**Table 22: Summary of Quarterly Results – Groundwater 2023**

Site	Depth to Water Level (m)			pH			EC (µS/cm)			Sulphate (mg/L)			Total Nitrogen <sup>1</sup> (mg/L)	Total Phosphorous (mg/L)
	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Annual	Annual
<b>MP Bores</b>														
<b>MP1</b>	<b>1.2</b>	<b>1.3</b>	1.4	6.3	7.3	7.8	558	826	1230	20.0	95.8	310	0.22	0.05
<b>MP2</b>	14.8	15.1	15.7	6.5	7.3	7.9	140	967	3299	2.0	63.0	<b>240</b>	0.22	0.05
<b>MP4</b>	17.6	18.2	19.3	6.1	6.8	7.3	169	1110	3783	3.0	29.0	110	0.52	0.05
<b>MP5</b>	18.8	19.4	19.8	6.8	7.1	7.4	314	538	824	2.0	2.9	6	0.42	0.05
<b>MP7</b>	17.7	18.3	18.7	6.8	7.6	8.2	2370	3728	5528	15	35.8	49	0.22	0.05
<b>MP10</b>	4.2	4.6	5.0	6.6	7.1	7.6	386	4494	7578	17	25.0	35	0.38	0.05
<b>MP11</b>	10.5	10.6	10.9	7.2	7.4	7.5	15	348	715	2	9.5	32	<b>5.00</b>	0.05
<b>GPZ Bores</b>														
<b>GPZ1</b>	10.8	11.1	11.9	7.6	<b>7.9</b>	<b>8.2</b>	430	668	991	8.9	20.4	50	<b>45.04</b>	0.76
<b>GPZ2</b>														
<b>GPZ5</b>	8.4	8.8	9.2	7.6	<b>7.9</b>	<b>8.0</b>	2000	2713	3800	3.0	<b>402.6</b>	<b>1600</b>	<b>9.5</b>	0.15
<b>GPZ6</b>	4.4	5.0	5.8	7.0	7.7	<b>8.6</b>	348	596	788	2.0	20.1	33	2.40	0.41
<b>GPZ8</b>	6.6	6.7	6.8	6.9	<b>7.9</b>	<b>9.8</b>	1110	1782	2668	2.9	5.6	9	0.72	0.05

Note 1 – Total Nitrogen equals TKN+NOx

### 6.5.3.1 Depth to Groundwater

Groundwater levels at MP series bores generally remained within the historical range of depth and were consistent with those for 2023. MP1 was under the minimum trigger level of 1.64 m throughout the reporting period, with Q1 (8 February) and Q2 (7 June) recording the lowest depth at 1.2m. MP1 was not within the Groundwater Monitoring Criteria.

Groundwater levels at the GPZ bores were also consistent with baseline levels and previous results. All GPZ bores were well within the monitoring criteria.

### 6.5.3.2 pH

The MP bores were consistently between 6.1 and 8.2 pH for the quarterly monitoring in 2023. The most acidic (minimum) result was 6.1 pH at MP4.

All pH results at MP series bores were well within the monitoring criteria. There were big significant changes in the annual averages between 2020 and 2021 at any of the monitoring points, with largest change being 1.1 units at MP2.

GPZ bores all recorded as being slightly alkali in 2023, with multiple exceedances in the GPZ pH maximum trigger . GPZ1 and GPZ5 both recorded exceedances in all four monitoring events in 2023. As these exceedances occurred over consecutive monitoring events. As Holcim failed to notify the Department or EPL of these consecutive exceedances, this is an administration non-compliance.

Holcim will continue to assess trends in groundwater results to identify when further mitigation measures are required.

### 6.5.3.3 Electrical Conductivity

The electrical conductivity levels varied between each MP series bore. However, all 2023 samples were within the trigger levels and historical range of 15  $\mu\text{S}/\text{cm}$  to 7,578  $\mu\text{S}/\text{cm}$ .

All results for electrical conductivity were compliant.

### 6.5.3.4 Nutrients

#### Sulphate

The sulphate levels in the MP bores over 2023 were generally compliant with the sulphate maximum trigger value. MP2 recorded 240mg/L in Q3, which is above the 152mg/L maximum trigger value. The sulphate results over 2023 were generally consistent with 2022 and 2021 averages.

The sulphate levels in the GPZ bores over 2023 were generally compliant with the sulphate maximum trigger value. GPZ5 recorded 1600mg/L in Q3, which is above the maximum trigger value. GPZ1, GPZ6 and GPZ8 recorded similar averages to the 2022 annual average, ranging from 5.6mg/L to 20.4mg/L which complies with the trigger values.



## **Total Nitrogen**

Generally, all MP monitoring sites were well within the trigger levels. MP series bores ranged from a minimum of 0.02 mg/L to a maximum of 4.5 mg/L. These 2023 results have generally decreased when compared to 2022 results for total nitrogen. MP11 recorded 5.0mg/L which is outside the criteria

GPZ1 recorded 45.04mg/L and GPZ5 recorded 9.5mg/L, both are above the criteria of 5.0mg/L. GPZ6 recorded 2.4mg/L and GPZ8 recorded 0.72, which is all below performance criteria.

While two instances of Total Nitrogen were recorded above performance criteria, Holcim believes this is compliant with the project approval and water management plan. As neither were recorded at the same location, notification to the Department is not required as per the Trigger Response of the Groundwater Management Measures.

## **Phosphorous**

All total phosphorous monitoring results at MP series bores were below the maximum trigger level of 3.02 mg/L. This is consistent with the results of previous years.

The phosphorous levels at GPZ series bores were below the maximum trigger value of 1.2 mg/L for 2023.

All groundwater bores were compliant with total phosphorous criteria.

### **6.5.4 Proposed Improvements**

Future Annual Reviews will continue to compare results against longer term trends and trigger levels from the WMP. In particular, Lynwood will compare the pH levels at GPZ1 and GPZ5 in 2024.

Holcim will continue groundwater data collection at Lynwood Quarry.

## 6.6 Noise

### 6.6.1 Environmental Management Measures

The Lynwood Noise Management Plan (NMP) was implemented in this reporting period. The NMP has been prepared in accordance with the Development Consent and outlines measures for monitoring and managing noise emissions at Lynwood Quarry. The NMP also outlines a range of design controls, ongoing operational controls, and a noise monitoring program which the site has undertaken in 2023.

### 6.6.2 Performance Criteria

Noise impact assessment criteria for monitoring are specified in the Development Consent are outlined in **Table 23** below.

**Table 23: Noise Criteria**

Location	Day (7am to 6pm)	Evening (6pm to 10pm)	Night (10pm to 7am)	
	dBA, LA <sub>eq</sub> (15min)	dBA, LA <sub>eq</sub> (15min)	dBA, LA <sub>eq</sub> (15min)	dBA, LA <sub>1</sub> (1min)
1	35	35	35	45
2	35	35	35	45
3	35	35	35	45
4	35	37	35	46
5	35	35	35	46
6	35	37	36	46
7	38	38	35	55
8	39	38	36	55
9	39	39	37	56
10	42	42	40	53
11	35	35	35	47
12	37	37	36	47
13	40	38	37	47
14	35	35	35	47
15	35	35	35	47
16	35	35	35	45

### 6.6.3 Environmental Outcomes

Attended noise monitoring was conducted on a quarterly basis during the report period. Attended noise monitoring was conducted by Ramboll Australia Pty Ltd (Ramboll) at four representative monitoring locations surrounding the site during quarrying activities. These noise monitoring reports are provided in **Appendix 1**. Noise monitoring locations are generally considered representative of the nearest private receivers in various directions of the operational area.

Noise monitoring was undertaken on the following dates:

- 06, 07, and 08 February 2023
- 30 May and 01 June 2023

- 04, 05 and 07 September 2023
- 06, 07, and 08 December 2023.

Noise monitoring occurred at the locations shown in **Figure 4** and listed in **Table 24**. As noted in the Lynwood Quarry NMP (SLR, 2020), monitoring at these locations are considered representative of all locations assessed as part of the Noise Impact Assessment (Umwelt, 2015).

The noise monitoring results from 2023 are summarised in **Table 25**. There were no LAeq (15min) exceedances in the noise criteria during the quarterly monitoring. During the 2023 monitoring period, the quarry noise was below the consent criteria, and was assessed as being inaudible at all locations. Extraneous sources of noise included birds, insects, distant traffic, aircraft, and wind.

During the December monitoring, the LA1 quarry contribution exceeded the LA1(1min) (dBA) criteria for all locations but it was noted that LA1 was dominated by birds, barking dogs and or road traffic at each location, with the quarry being assessed as inaudible.

Further discussion on the findings is found in the Ramboll Noise Monitoring Assessment reports in **Appendix 1**.

**Table 24: Noise Monitoring locations**

Location	Address	Day LAeq(15min)	Evening LAeq(15min)	Night LAeq(15min)	Night LA1 (1min)
N1	Residence west of the project area	35	35	35	45
N2	End of Maclura Drive, Marulan	35	37	36	46
N3	Residence to the south of the site	35	35	36	47
N4	North-eastern boundary of the project area at rural residential subdivision, (Dorsett Road).	37	37	36	47

**Table 25: Noise Monitoring Summary 2023**

Location	Criteria	Q1	Q2	Q3	Q4	Compliance Status
<b>Day dBA, LA<sub>eq</sub>(15min)</b>						
N1	35	<35	<35	<35	<35	Compliant
N2	35	<35	<35	<35	<35	Compliant
N3	35	<35	<35	<35	<35	Compliant
N4	37	<37	<35	<35	<35	Compliant
<b>Evening dBA, LA<sub>eq</sub>(15min)</b>						
N1	35	<35	<35	<35	<35	Compliant
N2	37	<37	<37	<37	<37	Compliant –
N3	35	<35	<35	<35	<35	Compliant
N4	37	<37	<37	<37	<37	Compliant
<b>Night dBA, LA<sub>eq</sub>(15min)</b>						
N1	35	<35	<35	<35	<35	Compliant
N2	36	<36	<36	<36	<36	Compliant
N3	36	<35	<35	<35	<35	Compliant
N4	36	<36	<36	<36	<36	Compliant
<b>Night dBA, LA1(1min)</b>						
N1	45	<45	<45	<45	<48	Compliant - Refer to reports for external sources
N2	46	<46	<46	<46	<58	Compliant - Refer to reports for external sources
N3	47	41	<47	<47	<58	Compliant - Refer to reports for external sources
N4	47	<47	<47	<47	<47	Compliant - Refer to reports for external sources

#### **6.6.4 Trends in Data**

Monitoring results recorded during the report period indicates noise levels continue to trend below noise impact assessment criteria as stipulated within Development Consent. There have been no noise exceedances against the noise impact assessment criteria since the 2016 report period. The raw noise monitoring results are included in **Appendix 1**.

#### **6.6.5 Proposed Improvements**

No additional management or mitigation measures are proposed to be implemented which are outside of the existing approved NMP.

## 6.7 Biodiversity

### 6.7.1 Environmental Management Measures

Lynwood takes a multifaceted approach to managing biodiversity values within the broader landscape with biodiversity and rehabilitation management controls detailed in the Lynwood Quarry Rehabilitation and Landscape Management Plan (RLMP). Areas managed in accordance with the RLMP include habitat management areas, riparian zones, and wildlife corridors. Pre-clearance inspections are undertaken to identify the presence of habitat features such as tree hollows or stags and fauna within the disturbance area that can be relocated. Pre-clearance surveys also identify if nest boxes are required to be installed following the removal of habitat features within the disturbance boundary.

### 6.7.2 Performance Criteria

As noted in **Section 5.0** and in accordance with Schedule 3 Condition 48A of the Development Consent, Lynwood must retire Biodiversity Credits to the satisfaction of the Secretary and OEH. A summary of Biodiversity Credits required to be retired by Lynwood is summarised in **Table 26** below. It is noted that the current status of credits which have been retired are detailed in **Table 27**.

**Table 26: Summary of Biodiversity Credits to be Retired.**

Credit Type	Credits to be Retired
<b>Ecosystem Credits</b>	
HN614 <i>Yellow Box – Blakey’s Red Gum grassy woodland on the tablelands. South Eastern Highland Bioregion</i>	2,124
HN570 <i>Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands. South Eastern Highlands Bioregion</i>	881
HN515 <i>Broad-leaved Peppermint – Ribbon Gum grassy open forest in the north-east of the South Eastern Highlands Bioregion</i>	33
<b>Total</b>	<b>3,038</b>
<b>Species Credits</b>	
Squirrel Glider ( <i>Petaurus norfolcensis</i> )	1,725
<b>Total</b>	<b>1,725</b>

### 6.7.3 Environmental Outcomes

A summary of the credits retired in 2018 and the number of credits required to be retired into the future (credit balance) is detailed in **Table 27**. An outcome of the 2020 IEA was for Lynwood to continue consultation with DPHI regarding biodiversity credits and the process of retiring these, which Lynwood continues to consult for and pursue.

In accordance with the Development Consent and Lynwood Quarry Extraction Quarry Area Modification Biodiversity Assessment Report (2015), pre-clearing and post-clearing reports were prepared to identify significant habitat features when clearing was undertaken.

Ecological monitoring was undertaken by an external contractor during the reporting period. In 2023 Holcim engaged SLR Consulting Australia Pty Ltd (SLR) to perform ecological monitoring to satisfy requirements outlined in the Rehabilitation and Landscape Management Plan.

Key findings from the 2023 ecological monitoring report include the following:

- The areas of retained box gum woodland vegetation within the Biodiversity Offset Area (BOA) are generally in moderate to good condition and no immediate actions are necessary, other than control of isolated occurrences of high threat weeds.
- Other parts of the BOA were also generally in moderate to good condition, although control of high threat weeds is required as patches of these species occur particularly in the southeast portion of the BOA and along the access road to the quarry.
- The rehabilitation areas require weed control, maintenance of plantings and additional planting. Portions of the creek lines across the site (in the vicinity of CR1 and CR2) also require erosion control and bank stabilisation.
- The amenity bund requires additional work to stabilise erosion as well as additional planting in accordance with the Rehabilitation and Landscape Management.
- The site requires targeted weed control of Serrated Tussock and Blackberry, including spot spray techniques using herbicides or hand/mechanical removal with limited soil disturbance wherever practicable to reduce impacts to surrounding native vegetation and waterways.
- Nest box monitoring indicates a high rate of usage by native fauna and general good condition of most nest boxes. Removal of pests and ongoing monitoring of the boxes, particularly along Jaorimin Creek, is recommended to prevent further impacts on the native fauna using the boxes.
- It is recommended that one of the boxes is repositioned and one is relocated to a new tree.

Ecological monitoring occurred in Spring 2023 including at the amenity bund, retained Box-Gum Woodland, Habitat Management Area, and Biodiversity Offset Area. Nest box monitoring for the site's 59 nest boxes was undertaken by SLR ecologists in Winter 2023.

**Table 27: Summary of Retired Biodiversity Credits**

Credit Type	Credits Retired (2018)	Stage of Retirement	Credit Balance
HN614 Yellow Box – Blakey's Red Gum grassy woodland on the tablelands. South Eastern Highland Bioregion	1,063	Partially retired – credits retired for years 2016 – 2030 (inclusive)	1,061
HN570 Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands. South Eastern Highlands Bioregion	881	Complete	0
HN515 Broad-leaved Peppermint – Ribbon Gum grassy open forest in the north-east of the South Eastern Highlands Bioregion	0	Not required – Area not be disturbed until 2036.	33
Squirrel Glider ( <i>Petaurus norfolcensis</i> )	1,725	Complete	0

## 6.7.4 Trends in Data

Biodiversity performance at Lynwood has been sound through 2023 and previous reporting periods.

Lynwood continues to consult with authorities on the status of conservation areas as well as appropriate Management Plans for these areas.

## 6.7.5 Proposed Improvements or Actions Next Reporting period

No additional management, mitigation measures or monitoring is proposed to be implemented outside of the scope of the approved RLMP.

## 6.8 Weeds and Feral Animals

### 6.8.1 Weeds

The dominant weed species that have been found previously within the site include Fireweed (*Chamerion angustifolium*), *Optunia sp.*, Serrated tussock (*Nassella trichotoma*), Blackberry (*Rubus fruticosus*) and St John's Wort (*Hypericum perforate*). Weed management is conducted in accordance with the Rehabilitation and Landscape Management Plan.

Lynwood site staff undertook weed inspections during the report period. Ecological monitoring was also undertaken, as discussed in **Section 6.7**.

2023 ecological inspections found Serrated Tussock *Nassella trichotoma*, St John's Wort *Hypericum perforatum*, Blackberry *Rubus anglocandicans* across the site, including biodiversity offset areas. In the 2023 reporting period, Lynwood Quarry undertook weed spraying of Blackberry.

Weed spraying will continue in 2024.

### 6.8.2 Feral Animals

Lynwood undertook feral animal inspections on three occasions in 2023. A pest service was also engaged in the audit period to bait pest species including rodents in and around the administration areas of the site. **Table 28** details the results of these inspections.

**Table 28: Pest Report 2023**

Site	Date and Time	Species	Sighted	Removed
Quarry Area and Lands	18/03/2023 8:00 PM	Foxes	5	5
		Rabbits	8	4
		Other	1	1
Quarry Area and Lands	12/09/2023 8:00PM	Foxes	4	3
		Rabbits	17	15
		Other(Hare)	1	1
Quarry Area and Lands	04/11/2023 NPWS Permit No H12023114	Kangaroo's	+500	150
		Goat	16	0



The high rainfall and vegetation growth in 2021 and 2022 created favourable conditions for pest populations in the report period. Findings of the rehabilitation and ecological monitoring noted an opportunity to monitor for feral animals such as foxes, cats, and rabbits.

It is proposed Holcim will assess the need to undertake pest control measures in 2024 for rabbits and foxes on site.

## 6.9 Blasting and Vibration

### 6.9.1 Environmental Management Measures

The Blast Management Plan (BMP) was revised in 2020, with this sent to DPHI for comment and approval. The 2020 BMP sets out the criteria, monitoring frequencies, and management measures for blasting during quarrying operations.

Blast monitoring is undertaken at six monitoring locations (refer to **Figure 6.1**). The summary of 2023 blasts in **Table 29** shows that all blasts met airblast overpressure and ground vibration impact criteria for the report period.

### 6.9.2 Performance Criteria

Blasting performance criteria is set out in the EPL and Development Consent as outlined in **Table 29**.

**Table 29: Blast Criteria Summary**

Airblast Overpressure Criteria		
Location	Level (dB)	Allowable Exceedance
Residence on Privately owned land	115	5% of the total number of blasts over a period of 12 months
	120	0%
Ground Vibration Impact Assessment Criteria		
Location	Peak Particle Velocity (mm/s)	Allowable Exceedance
Residence on Privately owned land	5	5% of the total number of blasts over a period of 12 months
	10	0%
Main Southern Railway Line	25	0%
Reservoir*		Not applicable
Gas Pipeline	100	0%

\* Reservoir is not constructed. Blast monitoring not undertaken at this location.

### 6.9.3 Environmental Outcomes

A summary of blast monitoring performance during the report period is provided in **Table 30**. Blast monitoring data is provided in **Appendix 2**. All blasts during the report period were undertaken between 9 am – 5 pm Monday – Saturday. No blasts were undertaken on Sundays or Public Holidays. Results from blast monitors during the report period did not exceed the blast criteria in **Table 29**.

There was a total of 75 blasts in 2023. This is slightly lower than 2022 which recorded total number of 89 blasts.

**Table 30: Blast Monitoring 2023. Summary**

Parameter Summary		Number of Blasts	Percentage of Blasts
<b>Total Number of Blasts</b>		75	NA
Blasts in Ignimbrite Pit		2	2.6%
Blasts in Granite Pit		73	97.4%
<b>Blasts exceeding allowable Overpressure criteria</b>		<b>0</b>	<b>0%</b>
<b>Blasts exceeding allowable Ground Vibration criteria</b>		<b>0</b>	<b>0%</b>
Blasts triggering Overpressure measurement	B4 Resident	1	1%
	B5 Resident	9	12%
Blasts triggering Ground Vibration measurement	B4 Resident	1	1%
	B5 Resident	9	12%
	Southern Railway Line	22	29%
	Gas Pipeline	22	29%
<b>Blasts with Data Captured</b>		<b>75</b>	<b>100%</b>

### 6.9.4 Trends in Data

Blasting results continued to trend below compliance limits during the report period with this also being the case in previous Annual Review periods. During the 2023 reporting period, monitoring location B4 recorded the highest Overpressure, recording 105.6 dBL on 13 June 2023. On 12 September, location B6 recorded the highest Ground Vibration, with 1.25mm/s at both the Rail and Pipeline. Full blast monitoring data is attached as **Appendix D**.

### 6.9.5 Proposed Improvements

No additional blast management improvements are proposed outside the current approved BMP during the next report period.

## 6.10 Waste Management

There were no changes to waste management practices during the report period. Waste streams at Lynwood Quarry are collected and disposed of by licenced waste contractors on an as-required basis. Holcim record when waste is collected from site and as well as volumes collected. A summary of the types and quantities of waste generated during the report period is provided in **Table 31**.

**Table 31: Long-term Summary of Waste Generation**

Waste Category	2023	2022	2021	2020	2019
Cardboard (t)	0.3	0.4	0.04	0.37	1.8
General Waste (t)	78.29	53.91	56.92	48.8	54.7
Steel (t)	78.02	162.05	88.68	84	90.28
Rubber (t)	<i>Included in General Waste</i>	<i>Included in General Waste</i>	<i>Included in General Waste</i>	<i>Included in General Waste</i>	<i>Included in General Waste</i>
Wood (t)	0	0	0	4.1	4.5
Oily Water (L)	9000	-	0	-	<i>Included in Used Oil</i>
Used Oil (L)	0	20,250	0	-	46,100
Oil Filter (number of bins)	0	-	0	18	20
Rags (number of bins)	<i>Included in General Waste</i>	<i>Included in General Waste</i>	<i>Included in General Waste</i>	<i>Included in General Waste</i>	<i>Included in General Waste</i>
Grease (L)	0	0	0	40,000 used in 2020	0
Tyres (t)	0	15	-	-	-

There has been an increase in General Waste from 53.91(t) in 2022 to 78.29(t) in 2023, and a reduction in steel from 162.05 (t) in 2022 to 78.08 (t) in 2023.

## 6.11 Indigenous Heritage

An Aboriginal Heritage Management Plan (AHMP) (Revision 3) has been prepared in accordance with the Development Consent. Lynwood Quarry also holds an Aboriginal Heritage Impact Permit (AHIP #1100264) for Quarry operation. The AHMP and AHIP set out relevant monitoring frequencies and management measures required during quarrying operations. Results of Aboriginal Heritage monitoring undertaken are discussed in the sections below.

### 6.11.1 Results of Aboriginal Heritage Site Monitoring

In compliance with the requirements of the Development Consent, the Lynwood Quarry had an existing Aboriginal Heritage Impact Permit (AHIP #1100264) for the life of the quarry for the Ignimbrite Pit development, Lynwood Quarry is required to undertake monitoring of Aboriginal sites located in proximity to the impact footprint boundary within the Ignimbrite Pit and Granite Pit areas. On a triennial basis, Holcim is required to monitor all the Aboriginal sites within the broader Lynwood Quarry project area.

The annual site monitoring on the Lynwood Quarry project area was in November 2023, with no additional Aboriginal artifacts discovered.

### **6.11.2 Meetings of the Aboriginal Heritage Management Committee**

The Aboriginal Heritage Management Committee's (AHMC's) ongoing role is to provide guidance and contribute to indigenous related activities and initiatives at Lynwood Quarry, as well as review the implementation of the AHMP.

The Aboriginal Heritage Management Plan requires the AHMC to meet on at least a six-monthly basis. During the report period, Lynwood Quarry undertook four (4) AHMC meetings, with these held on 16 March, 29 June, 28 September, and 23 November 2023.

Discussions at the AHMC Meetings centred around the Aboriginal Heritage Management Plan, discovery of artifacts, annual monitoring outcomes, cultural heritage awareness training, cultural burns, and general business.

### **6.11.3 Keeping Place Contract Development**

A meeting was held with the AHMC on 26 November 2018 to discuss the process for the construction and operation of the Keeping Place. At this time, a draft process was agreed and discussions with the AHMC are still ongoing.

Progress towards finalisation of the agreed process for the Keeping Place construction and management was ongoing in this reporting period.

The care of all 'Aboriginal objects' (stone artefacts) recovered from the Lynwood Quarry development footprint is detailed within 'Care' Permits #2761 and #2762 approved by DPC on 27 August 2007. Holcim, GAHAI, GTCAC, PLALC and PFC were all signatories to the Care Permit.

Holcim, PLALC and GTCAC are currently undergoing consultation in relation to setting up a Keeping Place within the Lynwood Quarry project area for future 'Long Term Care' of the Aboriginal objects. It is proposed that the Keeping Place will have display facilities for a selection of the Aboriginal objects and teaching materials to educate Aboriginal and non-Aboriginal visitors.

### **6.11.4 Revisions to the Aboriginal Heritage Management Plan**

In accordance with the conditions of MOD 4, Holcim was required to revise its AHMP to include management requirements for Aboriginal sites and potential archaeological deposits within the Granite Pit area.

This version (AHMP Revision 3) provides a framework for the ongoing management of Aboriginal sites and potential archaeological deposits (PADs) conserved in-situ for the life of Lynwood Quarry. The AHMP also sets out the requirements for long-term management of Aboriginal sites and PADs located within a Cultural Heritage Management Zone (CHMZ) set up within the broader Lynwood Quarry project area. The CHMZ

This version of the AHMP has been revised in accordance with Conditions 34 and 35 of the Terms of Approval for Modification 5 and Conditions 2 to 5 of Schedule 5 of the Development Consent.

## **6.12 Non-Indigenous Heritage**

No additional European Heritage management actions were undertaken during the 2023 report period. Actions from the Old Marulan European heritage report were reviewed and completed in 2017.

There are no proposed actions concerning European heritage for the next report period.

## 6.13 Bushfire Management

Bushfire hazards are managed in accordance with the Rehabilitation and Landscape Management Plan (RLMP).

Measures and safeguards included in the RLMP to minimise bushfire risk at Lynwood Quarry include:

- Fire breaks in the form of access and haul roads, rail lines, electricity easements, quarry pits and out-of-pit emplacement areas;
- Fuel reduction activities, as required, in consultation with the local Rural Fire Service;
- Selective grazing to assist with management of fuel loads;
- Asset protection zones in the form of hardstand areas, lawn, and bare earth around the quarry's permanent infrastructure;
- A range of onsite firefighting equipment including two water carts, fire hydrants and hose reels, to be used as required, and extinguishers located on infrastructure, mobile equipment, and light vehicles;
- Availability of water through the site water management system; and
- Emergency preparedness training for all quarry personnel.

No bushfires occurred in proximity to the site in 2023. Fuel reduction activities were undertaken to reduce the risk of severe bushfires in future reporting periods.

## 6.14 Public Safety

Access to the site by members of the public is via contact at the quarry office where visitors or contractors can only be escorted by site personnel around the site. Warning signs have been placed on extremities of operations to make members of the public are aware of quarrying operations.

During the previous 2022 reporting period it was identified that some maintenance of signage was required. This signage update was completed. There were no incidents related to public safety during the report period.

## 7.0 Water Management

### 7.1 Water Management System

Lynwood manages site inflows such as runoff, groundwater inflow, and external water sourced from Johnniefields Quarry Dam as well as discharge events as per the Water Management Plan (2020) (WMP). Lynwood is committed to the minimisation of water consumption through strategies outlined in the WMP including:

- Continued construction of water management devices to achieve the aims of the WMP;
- Vegetating non-operational areas;
- Calibration of water use for product quality; and
- The use of misting in fixed plant to reduce water used by dust suppression sprays.

As shown in **Figure 3** the Lynwood water management system consists of a number of onsite storage dams and diversion drains. Control structures have been constructed to minimise the interaction between clean and dirty water and to provide controls to treat captured dirty water to a standard acceptable for discharge off site. In addition to the storage of external water, storage dams are used to opportunistically capture run-off from the disturbed catchment area along with any groundwater seepage into the quarry pits. In 2019 a new stormwater sediment dam, G1, with capacity of 26 ML, was constructed at the Granite Pit. There were no changes to the water management system in 2023.

### 7.2 Water Take and Discharge

#### 7.2.1.1 External Water Use

Water imported onto the project site on an “as needs” basis is continually tracked against its licenced allocation. In 2023 there was no water pumped from the Johnniefields Dam for use onsite. This is compliant with the water sourcing limit under the landholder’s agreement.

**Table 32** provides a summary of water take during the report period. There was no water take from licensed bores.

**Table 32: 2023 Water Take Summary**

Water Licence	Water sharing plan, source, and management zone (as applicable)	Entitlement	Passive take/ inflows (ML)	Active pumping	Total (units)
WAL: 25575 (continuing, unregulated river) 10UA119159 (expires May 2025)  Reference: 10AL102708  Other reference numbers: 10WA102709 (lower Wollondilly management zone), 10BL164515.	Upper Nepean and Upstream Warragamba Water source.	130 units (ML) of which Holcim have access to 80 ML due to a landholder agreement.	0	0 ML	0 ML

### **7.2.1.2 Licenced Discharges**

Lynwood did not undertake any controlled or any uncontrolled discharges from site during the report period.

## **7.3 Erosion and Sedimentation**

### **7.3.1 Environmental Management Measures**

The WMP Erosion and Sediment Control (ESC) Plan provides a framework for the management of erosion and sedimentation at Lynwood. ESC measures are implemented to minimise impact on the surrounding environment. All ESC measures at Lynwood are designed and constructed to the standard consistent with:

- Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom 2004); and
- Managing Urban Stormwater – Soils and Construction, Volume 2E Mines and Quarries (DECC 2008d).

ESC structures and clean water diversions were constructed and maintained during the development of the Granite Pit. No sediment dams were mined through or decommissioned during this report period.

### **7.3.2 Proposed Improvements**

No additional management or mitigation measures are proposed to be implemented which are outside of the existing WMP (2020) and RLMP (2018).

## 8.0 Rehabilitation

As with all quarry operations, the progression of the quarry pit will be based on market demand and will therefore be subject to change. The progression of the rehabilitation of the site is therefore also subject to market demand. Whilst every opportunity will be taken to rehabilitate areas not required for future operational use, rehabilitation opportunities were limited during the report period as the works undertaken during the report period focussed on continued quarrying activities.

Rehabilitation of the Granite Pit benches will commence once the resource is exhausted and sufficient areas are available for rehabilitation. Due to the extent of the resource within the Granite Pit, rehabilitation of final benches will commence in approximately 30 years. Backfilling is proposed for the Lynwood Pit resulting in no final void located in this area. Once rehabilitated, these areas will be monitored and managed until self-sustaining. Final rehabilitation areas will achieve the rehabilitation completion criteria specified in the RLMP (2018).

Ongoing opportunities for rehabilitation will be limited to rehabilitation following haul road construction, the western amenity bund, and the southern edge of the overburden emplacement area. Where appropriate, temporary land shaping, seeding and other revegetation works may be undertaken in disturbed areas to minimise the potential for offsite impacts associated with the migration of windblown dust, particularly from stockpiles and stripped soil surfaces not required for operational use. Topsoil stockpiles are temporarily stabilised via seeding to minimise the potential for loss of soil through wind or rainfall erosion.

### 8.1 Status of Quarrying and Rehabilitation

Construction of the visual amenity bund to the west of the Granite Pit also commenced in late 2018, continued throughout 2020, and was delayed due to adverse weather in 2021. Sections of the bund were temporarily stabilised in 2021. The construction of the visual amenity bund to the west of Granite pit was completed in October 2022 and planting of tubestock was completed during the 2023 reporting period. There were addition tube stock plantings along the granite pit haul road and Joaromin Creek.

Topsoil stockpiles have been seeded with the aim of establishing ground cover and reducing soil substrate loss via erosion. This material is planned for use in the rehabilitation of the site following the completion of quarrying operations..

The rehabilitation status for Lynwood Quarry is presented in **Table 33**.



**Table 33: Rehabilitation Status**

Quarry Area Type	2018 (ha)	2019 (ha)	2020 (ha)	2021 (ha)	2022 (ha)	Report Period 20223(ha)	Next Report Period (forecast) 2024 (ha)
A. Total quarry footprint (all areas including active disturbance areas and rehabilitation areas)	36	42	42	62.4	62.4	62.4	62.4
B. Total active disturbance (areas within the footprint still requiring rehabilitation)	208	216	216	236	236	242.2	242.2
C. Land being prepared for rehabilitation	0	0	0	3.85	2	2	2
D. Land under active rehabilitation*	0	0	11	15	17	17	11
E. Completed rehabilitation (areas that have achieved completion criteria and been signed-off by DRG)	0	0	0	0	0	0	0

*\*Conservation area currently undergoing active rehabilitation as well as the amenity bund cover included in this area type.*

## **8.2 Post Rehabilitation Land Uses**

The proposed final land use aims to emulate the pre-mining environment. The final land use will enhance local and regional ecological linkages throughout the pit and surface infrastructure areas and with the adjacent surrounding landscape. The primary objective of site revegetation and regeneration is to create a stable final landform with acceptable post-quarrying land use.

## **8.3 Rehabilitation Activities**

Ecological monitoring of revegetated areas, fauna, and nest boxes was completed in 2023 as per the approved RLMP.

An update of the RLMP commenced in 2021 to resolve non-compliances identified during the preparation of the 2020 EPBC Compliance Report. Ecological assessments of the Box-Gum Woodland continued in 2023, including site visits. The studies will continue into 2024.

The rehabilitation monitoring was undertaken to assess fauna assemblages, establish baseline conditions for retained vegetation, and monitor vegetation health.

The areas of retained box gum woodland vegetation within the Biodiversity Offset Area (BOA) are generally in moderate to good condition and no immediate actions are necessary, other than control of isolated occurrences of high threat weeds.

Recent planting efforts were focussed on the outer face of the amenity bund, and up till December 2023, more than 670 tube stock were planted at the amenity bund.

## 9.0 Community

### 9.1 Community Engagement

#### 9.1.1 Community Consultative Committee Meetings

Two community consultative committee (CCC) meetings were held in 2023 with meetings on 24 April and 1 December 2023.

In 2023, the meetings provided updates on the general operations at site, community engagement, complaints received by the site, environmental updates, and an outline on actions for the next 6 months. The outcomes of both CCC meetings are detailed in the meeting notes available on the Lynwood Quarry website (<https://www.holcim.com.au/lynwood>).

#### 9.1.2 Community Activities

Lynwood Quarry supported several community-based activities during the report period. These activities are presented in **Table 34**. The site also supports the Chamber of Commerce, Goulburn, and District Show Jumping Club, and Gibraltarr Road residents. Activities of the Quarry are promoted through articles in the local newspaper (Discover Marulan), Community Information Sessions, and a Community Perception Survey

**Table 34: 2023 Community Engagement Activities and Sponsorship**

Community Activity	Amount Funded in 2023
Tallong Apple Day Festival	\$900
Marulan Football Club	\$500
Tallong Public School P&C	\$1,800
Cystic Fibrosis Goulburn	\$2000
Goulburn Rotary Charity Golf Day	\$5000
TREK4KIDS Starlight foundation	\$3000
Total	\$13,200

#### 9.1.3 Community Investment Fund

The Community Investment Fund (CIF), dedicated to the communities of Marulan and surrounds, is designed to improve the quality of life of the members of the Holcim workforce, their families, and the community. The CIF has been designed to improve economic, cultural, and social development throughout the region. Lynwood Quarry budgets a total of \$50,000 annually for projects which contribute to the goals of the community.

Both the current CIF Plan and CIF Application Form are available to the public on the Lynwood Quarry website.

**Appendix 4** lists the approved CIF funded projects since the inception of the CIF. Lynwood will continue to support local community projects in 2024.

## 9.2 Complaints

In accordance with Condition M5 of the EPL, a community complaints line is operated by Lynwood Quarry during the hours of operation. The complaints line is also displayed on the Lynwood Quarry website. This contact point provides the community with a mechanism by which to raise any concerns that they have with operations at Lynwood Quarry.

The Lynwood Quarry Environment Management Strategy (EMS) was updated and approved by DPHI in 2020. It details the complaints management and dispute resolution procedures for the site. The Quarry Manager is responsible for the implementation of the complaints management process so that complaints are responded to in a timely manner. Investigation findings and corrective actions implemented are communicated to the complainant as appropriate.

A summary of complaints received by Lynwood Quarry between 2014 and 2023 is presented in **Table 35**. Lynwood Quarry received no complaints during the 2023 reporting period.

Lynwood Quarry maintains a Complaints Register to record complaints received from the community, with the register contained on the Lynwood Quarry website (<https://www.holcim.com.au/lynwood>).

**Table 35: Comparison of complaints for Lynwood 2014 - 2023**

Complaint Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Noise	0	0	0	1	2	4	0	0	0	0
Air quality (dust)	0	1	0	1	6	41	2	0	0	0
Blasting	0	2	1	1	0	0	3	0	0	0
Traffic	0	0	0	0	0	0	1	0	0	0
Water	0	0	0	0	0	0	0	0	0	0
Other	3	0	0	0	0	2	1	2	0	0
<b>Total</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>8</b>	<b>47</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>0</b>

### 9.3 Independent Audit

An Independent Environmental Audit (IEA) was conducted on 29 September 2020 as per Condition 11 of DA 128-5-2005. This was the fourth IEA for the quarry. The next IEA was due in September 2023

Schedule 5, Condition 11 states:

*“By 30 September 2017, and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:*

*(a) be conducted by suitably qualified, experienced, and independent team of experts whose appointment has been endorsed by the Secretary;*

*(b) include consultation with the relevant agencies and the CCC;*

*(c) assess the environmental performance of the development and whether it is complying with the relevant requirements in this consent and any relevant EPL and/or Water Licence*

*(including any assessment, plan or program required under these approvals);*

*(d) review the adequacy of any approved strategy, plan or program required under these approvals;*

*(e) recommend measures or actions to improve the environmental performance of the development, and/or any assessment, plan or program required under these approvals; and*

*(f) be conducted and reported to the satisfaction of the Secretary.”*

Lynwood received endorsement for EMM Consulting Pty Limited (EMM) to undertake the audit, however the IEA did not occur within the 2023 reporting period. As this IEA was not undertaken during the 2023 reporting period, this is deemed an administration non-compliance.

EMM have since undertaken the IEA on 12 January 2024 and an update to the IEA action plan will be provided in the next Annual Review.

## 10.0 Incidents and Non-Compliances during the Report Period

Lynwood Quarry notified DPHI of non-compliances in the reporting period. A summary of these incidents and any internal or external actions undertaken by Lynwood to correct non-compliances or prevent future incidents is presented in **Table 36**.

**Table 36: Summary of Incidents**

Non-Compliance	Condition	Date	Explanation and Comments
<p><u>Air Quality Monitoring</u></p> <p>Multiple invalidated or exceeded samples recorded during the 2023 reporting period.</p>	<p>Condition 12 of Schedule 3</p> <p>Condition 15 of Schedule 3</p> <p>EPL Condition M2.2</p>	<p>HVAS 1 PM<sub>10</sub> missed samples occurred on:</p> <ul style="list-style-type: none"> <li>• April 25, 2023</li> <li>• July 6, 2023</li> <li>• August 11, 2023</li> <li>• August 17, 2023</li> <li>• August 23, 2023</li> <li>• September 16, 2023</li> <li>• September 22, 2023</li> <li>• October 4, 2023</li> </ul> <p>HVAS1 PM<sub>10</sub> exceedance occurred on:</p> <ul style="list-style-type: none"> <li>• April 25, 2023 (58.4 µg/ m<sup>3</sup>)</li> </ul> <p>HVAS2 PM<sub>10</sub> missed sample on:</p> <ul style="list-style-type: none"> <li>• May 7, 2023</li> </ul> <p>HVAS 2 PM<sub>10</sub> exceedance occurred on:</p> <ul style="list-style-type: none"> <li>• February 24, 2023 (63.4 µg/ m<sup>3</sup>)</li> </ul>	<p>Samples across 2023 were missed due to the sample being invalidated as unit did not run for 24 hours. This was due to power supply issues to the stations, which has since been resolved.</p> <p>Both HVAS1 and HVAS2 recorded PM<sub>10</sub> exceedances. Holcim believes that neither exceedance is due to quarry operations. All incidents were reported.</p>
<p><u>Surface water Management Plan</u></p> <p>Non-Compliance for failing to notify the Department of surface water exceedances during 2023 reporting period. (pH, and Oil and Grease)</p>	<p>Condition 23 of Schedule 3</p>	<p>Multiple dates throughout 2023</p>	<p>Holcim failed to notify the DPHI or EPL during the reporting period of consecutive exceedances above criteria levels</p> <p>Holcim will ensure that all consecutive exceedances are reported to Department and EPL in 2024</p>
<p><u>Groundwater Monitoring Plan</u></p> <p>Non-Compliance for failing to notify the Department of ground water exceedances (pH)</p>	<p>Condition 24 of Schedule 3</p>	<p>Multiple dates throughout 2023</p>	<p>Holcim failed to notify the DPHI or EPL during the reporting period of consecutive exceedances above criteria levels</p> <p>Holcim will ensure that all consecutive exceedances are reported to Department and EPL in 2024</p>
<p><u>Independent Environmental Audit</u></p> <p>Lynwood failed to undertake the 2023</p>	<p>Condition 11 of</p>	<p>By the end of September 2023</p>	<p>Holcim acknowledges that the IEA was unable to be conducted by September 2023. On 12</p>



Non-Compliance	Condition	Date	Explanation and Comments
Independent Environmental Audit within the time period specified by the development consent	Schedule 5		January, EMM undertook the IEA for Lynwood Quarry.
<u>Incident Notification</u> Holcim failed to notify the department of surface and ground water exceedances during the 2023 reporting period.	Condition 8 of Schedule 5	Throughout 2023	Holcim will ensure that any appropriate exceedances detailed in Management Plans will be notified to the Department.

## **11.0 Activities to be Completed in the Next Report Period**

Lynwood Quarry proposes to undertake a range of activities during the 2024 report period related to continued quarrying operations and also related to completion of actions required as a result of the 2020 IEA. Actions proposed to be undertaken by Holcim at Lynwood Quarry during 2023 include:

- Complete implementation of the actions identified in the IEA Action Plan;
- Implementation of approved environmental Management Plans;
- Continued extraction within the Granite Pit;
- Maintenance visual amenity bund to the west of the Granite Pit; and
- Continued weed and feral animal management.

**APPENDIX 1**  
**Noise Monitoring Reports**

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

Document type  
**Report**

Date  
**May 2023**

Project number  
**318000911**

# **QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 1 2023 LYNWOOD QUARRY, MARULAN, NSW**

**QUARTERLY NOISE MONITORING ASSESSMENT –  
QUARTER 1 2023  
LYNWOOD QUARRY, MARULAN, NSW**

Project name **Quarterly Noise Monitoring Assessment for Lynwood Quarry – Quarter 1 2023**  
Project no. **318000911**  
Recipient **Wayne Beattie**  
Document type **Report**  
Version **1**  
Date **12/05/2023**  
Prepared by **Jake Bourke, Matilda Englert**  
Checked by **Greer Laing**  
Approved by **Greer Laing**  
Description **Data collected on 6, 7 and 8 February 2023 for the quarterly period ending March 2023 at Marulan, NSW, as part of the noise monitoring program**

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## CONTENTS

<b>Abbreviations and Definitions</b>	<b>2</b>
<b>1. Overview</b>	<b>3</b>
1.1 Project Driver	3
1.2 Site Location and Sensitive Receptors	3
<b>2. Noise Criteria</b>	<b>5</b>
<b>3. Methodology</b>	<b>6</b>
<b>4. Results and Discussion</b>	<b>7</b>
4.1 Location N1	7
4.2 Location N2	8
4.3 Location N3	9
4.4 Location N4	10
<b>5. Conclusion</b>	<b>11</b>
<b>6. References</b>	<b>12</b>
<b>Tables</b>	
Table 2-1: Monitoring locations and noise criteria	5
Table 4-1: Noise survey results and observations for Location N1	7
Table 4-2: Noise survey results and observations for Location N2	8
Table 4-3: Noise survey results and observations for Location N3	9
Table 4-4: Noise survey results and observations for Location N4	10

## 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

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

# 1. OVERVIEW

## 1.1 Project Driver

Ramboll Australia Pty Ltd (Ramboll) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Lynwood Quarry (“the quarry”) at Marulan, NSW.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPI) (NSW EPA, 2017).
- Lynwood Quarry Noise Management Plan (NMP) (Holcim Australia, 2019).
- Environment Protection Licence (EPL) number 12939 (NSW EPA, 2021).
- Development Consent DA 128-5-2005 (Minister for Planning, 2017).
- Australian Standard AS 1055:2018 Acoustics — Description and measurement of environmental noise (Standards Australia, 2018).
- IEC 60942 Ed. 3.0 b:2003 Electroacoustics - Sound calibrators (Standards Australia, 2003).

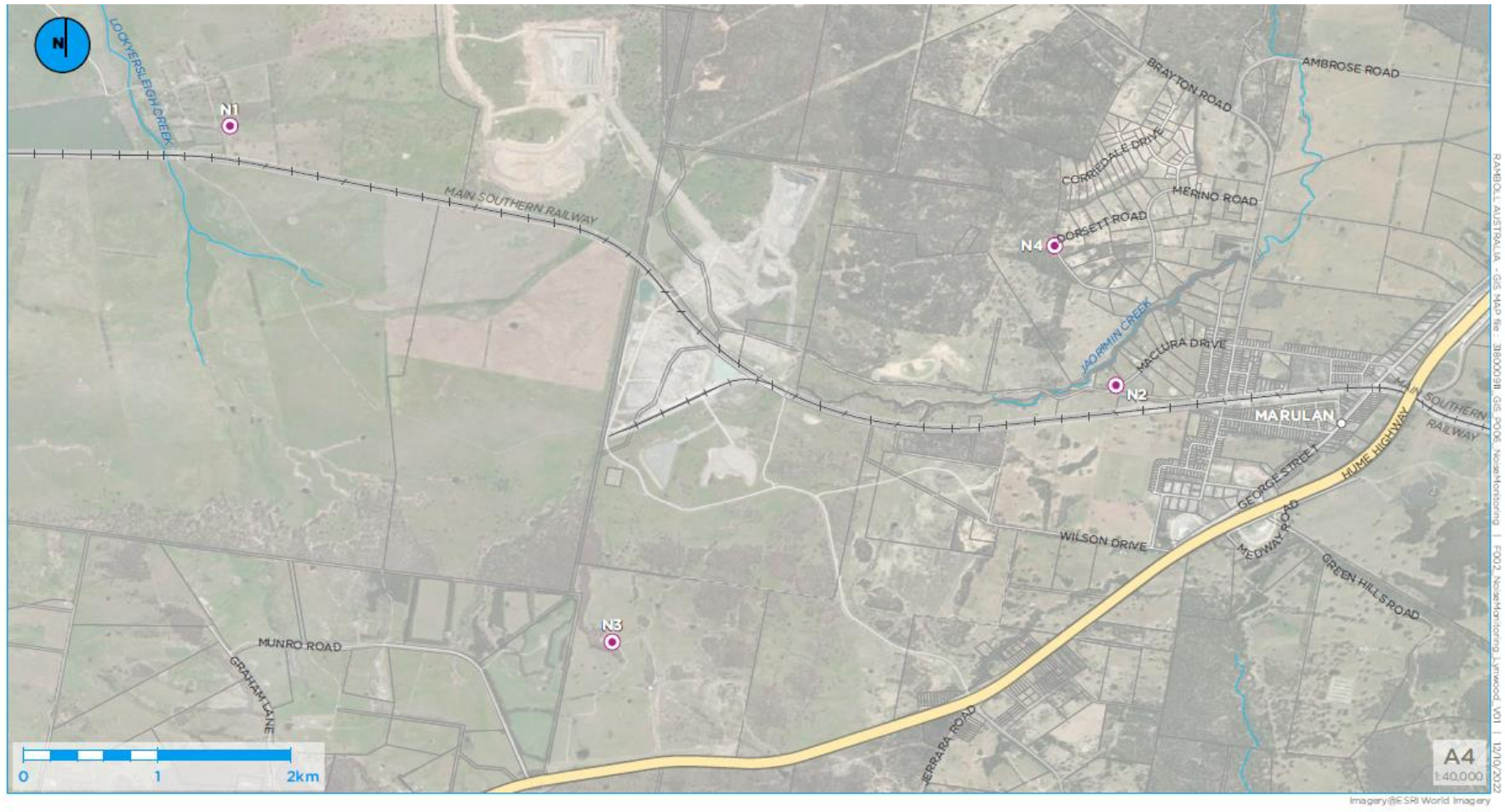
This NMA has been undertaken for the quarterly period January to March 2023, and forms part of the monitoring program to determine compliance with conditions of the Development Consent.

## 1.2 Site Location and Sensitive Receptors

The quarry is located at 278 Stoney Creek Road, approximately 4 km to the west of the Marulan railway station and town centre. Sensitive receptors surrounding the quarry are primarily rural and residential (to the west of the site). The Hume Highway is located to the east and south of the quarry. Highway traffic (Hume Highway) is a dominant noise source.

The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan in **Figure 1**.





**Legend**  
 ● Noise monitoring location

Figure 1 : Noise monitoring locations at Lynwood Quarry

Confidential

## 2. NOISE CRITERIA

**Table 2-1** includes the applicable noise criteria outlined in the Development Consent and the EPL for the 16 residential receivers surrounding the quarry (L1–L16), and the four monitoring locations adopted from the NMP that are deemed representative and applicable for this NMA (N1–N4). It should be noted that N3 was only accessible during the day and evening; night monitoring was completed at nearby location NM3 but on reflection the location within the quarry boundary to deemed unsuitable.

**Table 2-1: Monitoring locations and noise criteria**

EPL ID	Receiver Description	Monitoring Locations		Day <sup>1</sup>	Evening <sup>2</sup>	Night <sup>3</sup>	Night <sup>3</sup>
		NMP ID	Address	LAeq (15min)	LAeq (15min)	LAeq (15min)	LA1 (1min)
				dBA			
L1	West of the Granite Pit.	N1	1114 Carrick Road, Marulan	35	35	35	45
L2	Northeast of the site	-	-	35	35	35	45
L3	Northeast of the site	-	-	35	35	35	45
L4	East of the site in Marulan	-	-	35	37	35	46
L5	East of the site in Marulan	-	-	35	35	35	46
L6	East of the site in Marulan	N2	End of Maclura Drive, Marulan	35	37	36	46
L7	East of the site in Marulan	-	-	38	38	35	55
L8	East of the site in Marulan	-	-	39	38	36	55
L9	East of the site in Marulan	-	-	39	39	37	56
L10	Southeast of the site in Old Marulan	-	-	42	42	40	53
L11	South of the site	N3	Northern Boundary, 16038 Hume Highway, Marulan	35	35	36	47
L12	East of the site in Marulan	N4	Corner of Dorsett and Suffolk Road, Marulan	37	37	36	47
L13	East of the site in Marulan	-	-	40	38	37	47
L14	South of the site	-	-	35	35	35	47
L15	South of the site	-	-	35	35	35	47
L16	Northeast of the site	-	-	35	35	35	45

<sup>1</sup> 7 am–6 pm Monday to Saturday and 8 am–6 pm Sunday and public holidays  
<sup>2</sup> 6 pm–10 pm Monday to Sunday  
<sup>3</sup> 10 pm–7 am Monday to Saturday and 10 pm–8 am Sunday and public holidays

### 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 Monday 6 February, Tuesday 7 February and Wednesday 8 February 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 day, evening, and night periods over three days. Where possible, throughout each measurement the operator quantified the contribution of each significant noise source.

## 4. RESULTS AND DISCUSSION

### 4.1 Location N1

Noise monitoring at location N1 conducted on Monday 6 February 2023, Tuesday 7 February 2023 and Wednesday 8 February 2023 resulted in inaudible noise during the day, evening, and night. The results and observations taken during the monitoring events at Location N1 are presented in **Table 4-1**. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring.

Noise sources measured included birds, barking dogs, and wind.

**Table 4-1: Noise survey results and observations for Location N1**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Lynwood Quarry Contribution (LA1sec) (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LAmx	LAeq	LA90						
06-02-23	16:38 (Day)	53.5	38.8	30.8	WD: 348° WS: 1.3 m/s Rain: Nil	Wind 39-43 Quarry inaudible	Inaudible	35	n/a	n/a
08-02-23	18:21 (Evening)	69.0	42.4	34.5	WD: 300° WS: 1.1 m/s Rain: Nil	Wind 40-50 Dogs barking 40-48 Birds 43-53 Quarry inaudible	Inaudible	35	n/a	n/a
07-02-23	6:20 (Night)	71.8	46.6	28.4	WD: 210° WS: 0.9 m/s Rain: Nil	Birds 30-66 Quarry inaudible	Inaudible	35	<45	45

## 4.2 Location N2

Noise monitoring at location N2 conducted on Monday 6 February 2023, Tuesday 7 February 2023 and Wednesday 8 February 2023 resulted in inaudible noise during the day, evening, and night. The results and observations taken during the monitoring events at Location N2 are presented in **Table 4-1**. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring.

Noise sources measured included wind, birds, frogs, excavators, and motorway traffic.

**Table 4-2 Noise survey results and observations for Location N2**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Lynwood Quarry Contribution (LA1sec) (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LAmx	LAeq	LA90						
06-02-23	15:00 (Day)	59.6	46.6	39.4	WD: 120° WS: 1.6 m/s Rain: Nil	Wind 44-50 Excavator 44-50 Quarry inaudible	Inaudible	35	n/a	n/a
08-02-23	19:23 (Evening)	54.5	41.0	38.1	WD: 246° WS: 1.1 m/s Rain: Nil	Road 40-47 Birds 40-45 Frogs 44-45 Quarry inaudible	Inaudible	37	n/a	n/a
07-02-23	5:19 (Night)	70.4	43.5	39.6	WD: 250° WS: 0.9 m/s Rain: Nil	Road 42-50 Quarry inaudible	Inaudible	36	<46	46

### 4.3 Location N3

Noise monitoring at location N3 conducted on Monday 6 February 2023, Tuesday 7 February 2023 and Wednesday 8 February 2023 resulted in inaudible noise during the day, evening, and night. The location was unable to be accessed during all periods due to a locked gate, so measurements were completed at an intermediate monitoring location approximately 900 m to the west on Munro Road, Marulan. The results and observations taken during the monitoring events at Location N3 are presented in **Table 4-1**. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring.

Noise sources measured included frogs, motorway traffic, wind, and insects.

**Table 4-3: Noise survey results and observations for Location N3**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Lynwood Quarry Contribution (LA1sec) (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>						
06-02-23	13:17 (Day)	60.0	39.7	34.7	WD: 110° WS: 3.2 m/s Rain: Nil	Wind 39-46 Highway 32-37 Quarry inaudible	Inaudible	<35	n/a	n/a
08-02-23	19:47 (Evening)	66.4	48.3	43.0	WD: 272° WS: 1.0 m/s Rain: Nil	Highway 45-54 Passing car 50-64 Wind 43-50 Quarry inaudible	Inaudible	<35	n/a	n/a
07-02-23	4:47 (Night)	59.6	42.9	35.8	WD: - WS: 1.2 m/s Rain: Nil	Frogs 35-38 Road 40-49 Insects 33-36 Quarry inaudible	Inaudible	<36	<47	47

#### 4.4 Location N4

Noise monitoring at location N4 was conducted on Monday 6 February 2023, Tuesday 7 February 2023 and Wednesday 8 February 2023 resulted in inaudible noise during the day, evening and night, The results and observations taken during the monitoring events at location N2 are presented in **Table 4-1**. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring.

Noise sources measured included birds, insects, passing cars, and wind.

**Table 4-4: Noise survey results and observations for Location N4**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Lynwood Quarry Contribution (LA1sec) (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LAmx	LAeq	LA90						
06-02-23	15:37 (Day)	57.1	39.1	32.0	WD: 100° WS: 1.7 m/s Rain: Nil	Passing car 40-42 Insects 35-38 Quarry inaudible	Inaudible	37	n/a	n/a
08-02-23	19:00 (Evening)	62.0	41.7	37.4	WD: 280° WS: 1.5 m/s Rain: Nil	Birds 40-50 Wind 40-45 Quarry inaudible	Inaudible	37	n/a	n/a
07-02-23	5:42 (Night)	57.7	39.9	34.4	WD: 212° WS: 0.8 m/s Rain: Nil	Road 33-40 Birds 42-57 Quarry inaudible	Inaudible	36	<47	47

## 5. CONCLUSION

This NMA was completed by Ramboll at the Holcim Lynwood Quarry, Marulan, NSW as a quarterly requirement of the NMP. Monitoring was carried out on Monday 6 February 2023, Tuesday 7 February 2023 and Wednesday 8 February 2023 at four locations selected as representative to the sensitive receptors at the surroundings to Lynwood Quarry. No audible noise from quarry operations was recorded at any of the four locations during the day, evening, and night periods.



## 6. REFERENCES

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

Document type  
**Report**

Date  
**July 2023**

Project number  
**318000911**

# **QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 2 2023 LYNWOOD QUARRY, MARULAN, NSW**

**QUARTERLY NOISE MONITORING ASSESSMENT –  
QUARTER 2 2023  
LYNWOOD QUARRY, MARULAN, NSW**

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Project name **Quarterly Noise Monitoring Assessment for Lynwood Quarry – Quarter 2  
2023**  
Project no. **318000911**  
Recipient **Wayne Beattie**  
Document type **Report**  
Version **1**  
Date **25/07/2023**  
Prepared by **Jake Bourke**  
Checked by **Andrew Bell, Rachel Condon**  
Approved by **Belinda Sinclair**  
Description **Data collected on 30 May and 1 June 2023 for the quarterly period ending  
June 2023 at Marulan, NSW, as part of the noise monitoring program**

## CONTENTS

<b>Abbreviations and Definitions</b>	<b>2</b>
<b>1. Overview</b>	<b>3</b>
1.1 Project Driver	3
1.2 Site Location and Sensitive Receptors	3
<b>2. Noise Criteria</b>	<b>5</b>
<b>3. Methodology</b>	<b>6</b>
<b>4. Results and Discussion</b>	<b>7</b>
4.1 Location N1	7
4.2 Location N2	8
4.3 Location N3	9
4.4 Location N4	10
<b>5. Conclusion</b>	<b>11</b>
<b>6. References</b>	<b>12</b>
<b>Tables</b>	
Table 2-1: Monitoring locations and noise criteria	5
Table 4-1: Noise survey results and observations for Location N1	7
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<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.
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<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).
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<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

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

# 1. OVERVIEW

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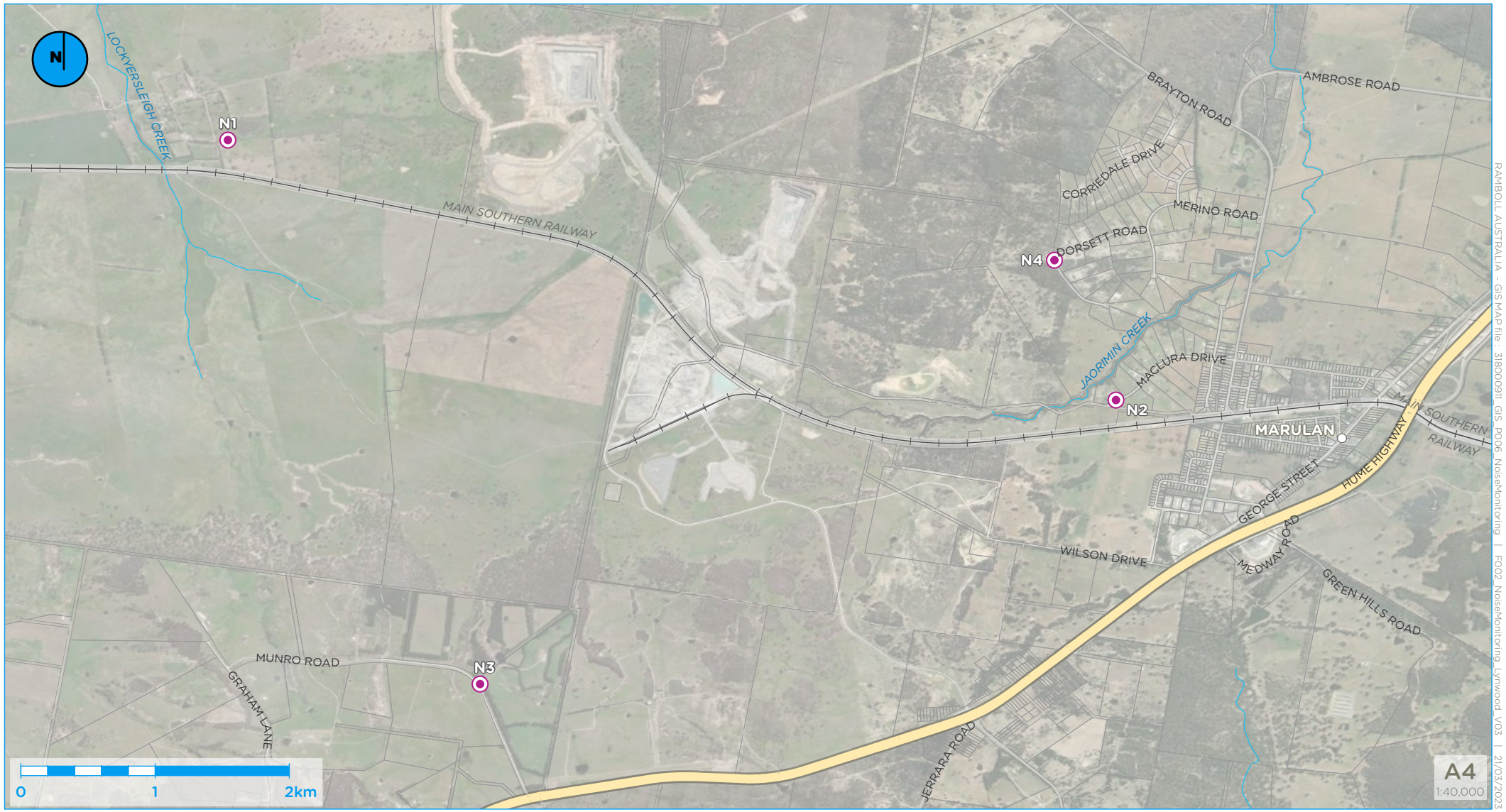
- Noise Policy for Industry (NPI) (NSW EPA, 2017).
- Lynwood Quarry Noise Management Plan (NMP) (Holcim Australia, 2019).
- Environment Protection Licence (EPL) number 12939 (NSW EPA, 2021).
- Development Consent DA 128-5-2005 (Minister for Planning, 2017).
- Australian Standard AS 1055:2018 Acoustics — Description and measurement of environmental noise (Standards Australia, 2018).
- IEC 60942 Ed. 3.0 b:2003 Electroacoustics - Sound calibrators (Standards Australia, 2003).

This NMA has been undertaken for the quarterly period April to June 2023, and forms part of the monitoring program to determine compliance with conditions of the Development Consent.

## 1.2 Site Location and Sensitive Receptors

The quarry is located at 278 Stoney Creek Road, approximately 4 km to the west of the Marulan railway station and town centre. Sensitive receptors surrounding the quarry are primarily rural and residential (to the west of the site). The Hume Highway is located to the east and south of the quarry. Highway traffic (Hume Highway) is a dominant noise source.

The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan in **Figure 1**.



**Legend**

● Noise monitoring location



Figure 1: Noise monitoring locations at Lynwood Quarry

## 2. NOISE CRITERIA

**Table 2-1** includes the applicable noise criteria outlined in the Development Consent and the EPL for the 16 residential receivers surrounding the quarry (L1–L16), and the four monitoring locations adopted from the NMP that are deemed representative and applicable for this NMA (N1–N4). It should be noted that the original location of N3 (on the northern boundary of 16038 Hume Highway, Marulan) continues to be inaccessible and as such N3 has been relocated to a nearby residential receiver approximately 900 m to the west on Munro Road, Marulan (**Figure 1**) where all future monitoring will take place. This revised location is deemed representative and applicable for this NMA.

**Table 2-1: Monitoring locations and noise criteria**

EPL ID	Receiver Description	Monitoring Locations		Day <sup>1</sup>	Evening <sup>2</sup>	Night <sup>3</sup>	Night <sup>3</sup>
		NMP ID	Address	LAeq (15min)	LAeq (15min)	LAeq (15min)	LA1 (1min)
				dBA			
L1	West of the Granite Pit.	N1	1114 Carrick Road, Marulan	35	35	35	45
L2	Northeast of the site	-	-	35	35	35	45
L3	Northeast of the site	-	-	35	35	35	45
L4	East of the site in Marulan	-	-	35	37	35	46
L5	East of the site in Marulan	-	-	35	35	35	46
L6	East of the site in Marulan	N2	End of Maclura Drive, Marulan	35	37	36	46
L7	East of the site in Marulan	-	-	38	38	35	55
L8	East of the site in Marulan	-	-	39	38	36	55
L9	East of the site in Marulan	-	-	39	39	37	56
L10	Southeast of the site in Old Marulan	-	-	42	42	40	53
L11	South of the site	N3	127 Munro Rd, Carrick	35	35	36	47
L12	East of the site in Marulan	N4	Corner of Dorsett and Suffolk Road, Marulan	37	37	36	47
L13	East of the site in Marulan	-	-	40	38	37	47
L14	South of the site	-	-	35	35	35	47
L15	South of the site	-	-	35	35	35	47
L16	Northeast of the site	-	-	35	35	35	45

<sup>1</sup> 7 am–6 pm Monday to Saturday and 8 am–6 pm Sunday and public holidays  
<sup>2</sup> 6 pm–10 pm Monday to Sunday  
<sup>3</sup> 10 pm–7 am Monday to Saturday and 10 pm–8 am Sunday and public holidays



### 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 Tuesday 30 May and Thursday 1 June 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 day, evening, and night periods over three days. Where possible, throughout each measurement the operator quantified the contribution of each significant noise source.

Where the 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, or estimated to be less than criteria value.

## 4. RESULTS AND DISCUSSION

### 4.1 Location N1

Noise monitoring at location N1 was conducted on Tuesday 30 May 2023 and Thursday 1 June 2023. Noise from the quarry was inaudible during the day, evening, and night monitoring periods, with the ambient noise environment dominated by wind gusts, a bird and passing trains. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring. The results and observations taken during the monitoring events at Location N1 are presented in **Table 4-1**.

**Table 4-1: Noise survey results and observations for Location N1**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Lynwood Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LAm <sub>ax</sub>	LA <sub>eq</sub>	LA <sub>90</sub>						
01-06-23	12:48pm to 1:03pm (Day)	65.4	49.6	42.0	WD: 300° WS: 8.2 m/s Rain: Nil	Wind 60 Bird 50-61 Passing train 65 Quarry inaudible	<32	35	n/a	n/a
30-05-23	6:28pm to 6:43pm (Evening)	61.1	41.2	31.0	WD: n/a WS: 0 m/s Rain: Nil	Wind gust 45-48 Persistent dog bark 37-47 Train 57 Quarry inaudible	<21	35	n/a	n/a
01-06-23	6:11am to 6:26am (Night)	81.0	50.1	39.8	WD: 300° WS: 3.8 m/s Rain: Nil	Wind 44-58 Quarry inaudible	<30	35	<45	45

#### 4.2 Location N2

Noise monitoring at location N2 was conducted on Tuesday 30 May 2023 and Thursday 1 June 2023. Noise from the quarry was inaudible during the day, evening, and night monitoring periods, with the ambient noise environment dominated by wind gusts, a horse and motorway traffic. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring. The results and observations taken during the monitoring events at Location N2 are presented in **Table 4-2**.

**Table 4-2 Noise survey results and observations for Location N2**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Lynwood Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>						
01-06-23	11:38am to 11:53am (Day)	74.3	46.7	41.3	WD: 300° WS: 6.9 m/s Rain: Nil	Wind gust 48-64 Motorway 42 Quarry inaudible	<31	35	n/a	n/a
30-05-23	6:00pm to 6:15pm (Evening)	71.3	50.2	44.4	WD: 300° WS: 4.0 m/s Rain: Nil	Horse 59 Wind 49-55 Motorway hum 46 Quarry inaudible	<34	37	n/a	n/a
01-06-23	5:15am to 5:30am (Night)	66.5	47.3	40.4	WD: 300° WS: 7.1 m/s Rain: Nil	Wind gust 46-66 Quarry inaudible	<30	36	<46	46

### 4.3 Location N3

Noise monitoring at location N3 was conducted on Tuesday 30 May 2023 and Thursday 1 June 2023. Noise from the quarry was inaudible during the day, evening, and night monitoring periods, with the ambient noise environment dominated by wind and motorway traffic. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring. The results and observations taken during the monitoring events at Location N3 are presented in **Table 4-3**.

**Table 4-3: Noise survey results and observations for Location N3**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Lynwood Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>						
01-06-23	10:55am to 11:10am (Day)	60.6	49.9	42.6	WD: 300° WS: 5.2 m/s Rain: Nil	Wind 44-61 Motorway 48 Quarry inaudible	<33	<35	n/a	n/a
30-05-23	7:57pm to 8:12pm (Evening)	61.4	51.2	47.6	WD: 270° WS: 4.6 m/s Rain: Nil	Wind gusts 48-56 Motorway 46 Quarry inaudible	<35	<35	n/a	n/a
01-06-23	4:41am to 4:56am (Night)	68.9	51.3	39.2	WD: 300° WS: 6.4 m/s Rain: Nil	Wind gusts 46-60 Quarry inaudible	<29	<36	<47	47

#### 4.4 Location N4

Noise monitoring at location N4 was conducted on Tuesday 30 May 2023 and Thursday 1 June 2023. Noise from the quarry was inaudible during the day, evening, and night monitoring periods, with the ambient noise environment dominated by wind gusts and a passing car. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring. The results and observations taken during the monitoring events at location N4 are presented in **Table 4-4**.

**Table 4-4: Noise survey results and observations for Location N4**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Lynwood Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LAm <sub>ax</sub>	LA <sub>eq</sub>	LA <sub>90</sub>						
01-06-23	12:02pm to 12:17pm (Day)	61.0	44.8	39.0	WD: 300° WS: 7.1 m/s Rain: Nil	Wind gusts 38-54 Passing car 57-60 Quarry inaudible	<29	37	n/a	n/a
30-05-23	6:28pm to 6:43pm (Evening)	62.9	48.9	45.6	WD: 300° WS: 4.2 m/s Rain: Nil	Wind gust 47-60 Quarry inaudible	<36	37	n/a	n/a
01-06-23	5:37am to 6:52am (Night)	54.5	42.8	38.5	WD: 300° WS: 3.9 m/s Rain: Nil	Wind gust 55 Quarry inaudible	<29	36	<47	47

## 5. CONCLUSION

This NMA was completed by Ramboll at the Holcim Lynwood Quarry, Marulan, NSW as a quarterly requirement of the NMP. Monitoring was carried out on Tuesday 30 May 2023 and Thursday 1 June 2023 at four locations selected as representative to the sensitive receptors at the surroundings to Lynwood Quarry. No audible noise from quarry operations was recorded at any of the four locations during the day, evening, and night periods.

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

## 6. REFERENCES

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Standards Australia (2003) *AS 60942:2003 Electroacoustics - Sound calibrators*. Australian Standard.

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# **QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 3 2023 LYNWOOD QUARRY, MARULAN, NSW**



**QUARTERLY NOISE MONITORING ASSESSMENT –  
QUARTER 3 2023  
LYNWOOD QUARRY, MARULAN, NSW**

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September 2023 at Marulan, NSW, as part of the noise monitoring program**

## CONTENTS

<b>Abbreviations and Definitions</b>	<b>2</b>
<b>1. Overview</b>	<b>3</b>
1.1 Project Driver	3
1.2 Site Location and Sensitive Receptors	3
<b>2. Noise Criteria</b>	<b>5</b>
<b>3. Methodology</b>	<b>6</b>
<b>4. Results and Discussion</b>	<b>7</b>
4.1 Location N1	7
4.2 Location N2	8
4.3 Location N3	9
4.4 Location N4	10
<b>5. Conclusion</b>	<b>11</b>
<b>6. References</b>	<b>12</b>
<b>Tables</b>	
Table 2-1: Monitoring locations and noise criteria	5
Table 4-1: Noise survey results and observations for Location N1	7
Table 4-2: Noise survey results and observations for Location N2	8
Table 4-3: Noise survey results and observations for Location N3	9
Table 4-4: Noise survey results and observations for Location N4	10

## 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>SPL</b>	The Sound Pressure Level. Sound pressure is the fluctuation in air pressure, from the steady atmospheric pressure, created by sound. The sound pressure level is the sound pressure expressed on a decibel scale.

Source: Noise Guide for Local Government (NSW EPA, 2023)

# 1. OVERVIEW

## 1.1 Project Driver

Ramboll Australia Pty Ltd (Ramboll) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Lynwood Quarry (“the quarry”) at Marulan, NSW.

This NMA was done in accordance with the following documents:

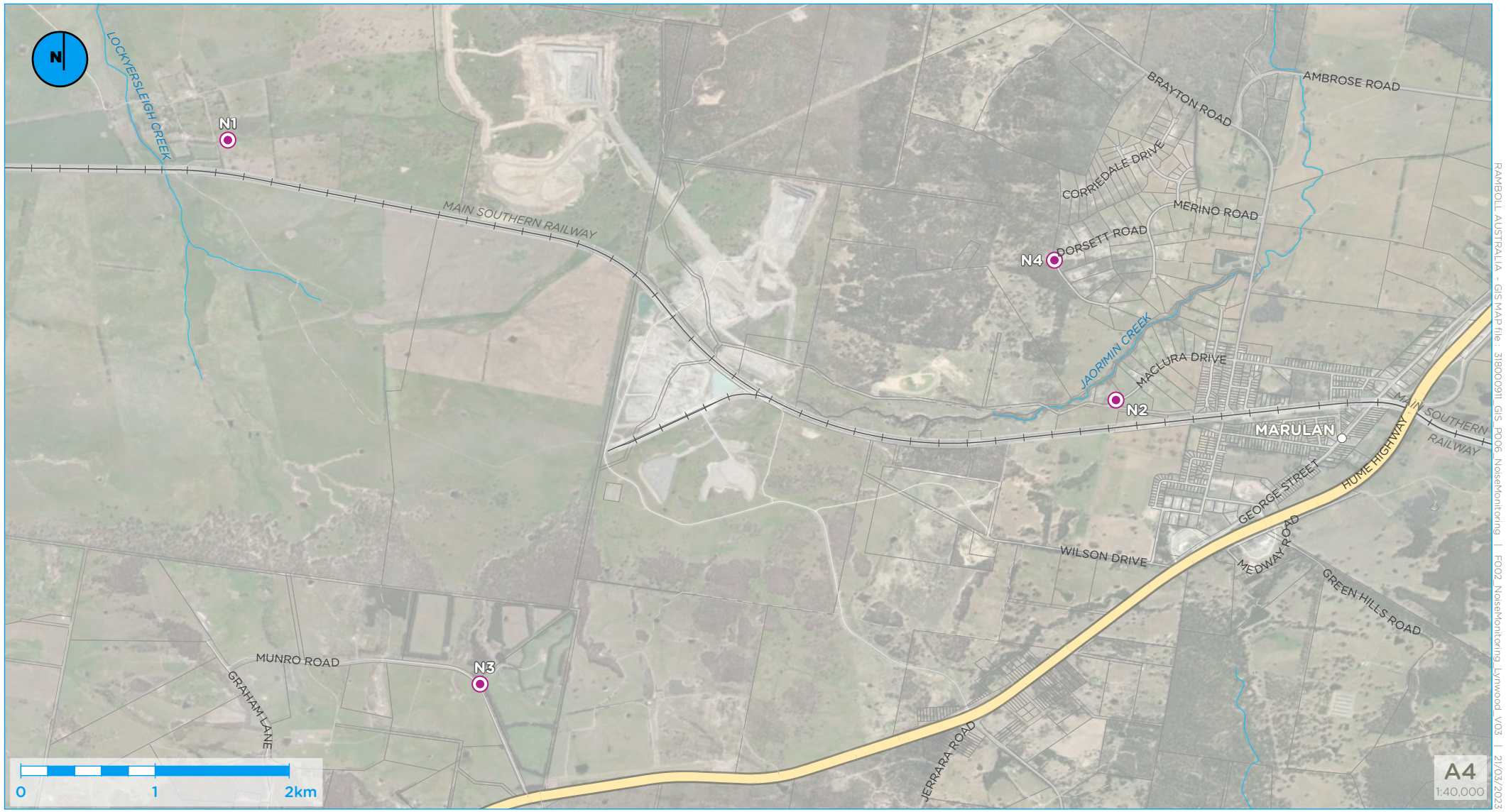
- Noise Policy for Industry (NPfI) (NSW EPA, 2017).
- Lynwood Quarry Noise Management Plan (NMP) (Holcim Australia, 2019).
- Environment Protection Licence (EPL) number 12939 (NSW EPA, 2021).
- Development Consent DA 128-5-2005 (Minister for Planning, 2017).
- Australian Standard AS 1055:2018 Acoustics — Description and measurement of environmental noise (Standards Australia, 2018).
- IEC 60942 Ed. 3.0 b:2003 Electroacoustics - Sound calibrators (Standards Australia, 2003).

This NMA has been undertaken for the quarterly period July to September 2023, and forms part of the monitoring program to determine compliance with conditions of the Development Consent.

## 1.2 Site Location and Sensitive Receptors

The quarry is located at 278 Stoney Creek Road, approximately 4 km to the west of the Marulan railway station and town centre. Sensitive receptors surrounding the quarry are primarily rural and residential (to the west of the site). The Hume Highway is located to the east and south of the quarry. Highway traffic (Hume Highway) is a dominant noise source.

The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan in **Figure 1**.



RAMBOLL AUSTRALIA - GIS MAP file: 318000911 GIS\_P006 NoiseMonitoring | F002 NoiseMonitoring\_Lynwood\_V03 | 21/03/2023  
 Imagery@ESRI World Imagery

**Legend**

● Noise monitoring location



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

## 2. NOISE CRITERIA

**Table 2-1** includes the applicable noise criteria outlined in the Development Consent and the EPL for the 16 residential receivers surrounding the quarry (L1–L16), and the four monitoring locations adopted from the NMP that are deemed representative and applicable for this NMA (N1–N4). It should be noted that the original location of N3 (on the northern boundary of 16038 Hume Highway, Marulan) continues to be inaccessible and as such N3 has been relocated to a nearby residential receiver approximately 900 m to the west on Munro Road, Marulan (**Figure 1**) where all future monitoring will take place. This revised location is deemed representative and applicable for this NMA.

**Table 2-1: Monitoring locations and noise criteria**

EPL ID	Receiver Description	Monitoring Locations		Day <sup>1</sup>	Evening <sup>2</sup>	Night <sup>3</sup>	Night <sup>3</sup>
		NMP ID	Address	LAeq (15min)	LAeq (15min)	LAeq (15min)	LA1 (1min)
				dBA			
L1	West of the Granite Pit.	N1	1114 Carrick Road, Marulan	35	35	35	45
L2	Northeast of the site	-	-	35	35	35	45
L3	Northeast of the site	-	-	35	35	35	45
L4	East of the site in Marulan	-	-	35	37	35	46
L5	East of the site in Marulan	-	-	35	35	35	46
L6	East of the site in Marulan	N2	End of Maclura Drive, Marulan	35	37	36	46
L7	East of the site in Marulan	-	-	38	38	35	55
L8	East of the site in Marulan	-	-	39	38	36	55
L9	East of the site in Marulan	-	-	39	39	37	56
L10	Southeast of the site in Old Marulan	-	-	42	42	40	53
L11	South of the site	N3	127 Munro Rd, Carrick	35	35	36	47
L12	East of the site in Marulan	N4	Corner of Dorsett and Suffolk Road, Marulan	37	37	36	47
L13	East of the site in Marulan	-	-	40	38	37	47
L14	South of the site	-	-	35	35	35	47
L15	South of the site	-	-	35	35	35	47
L16	Northeast of the site	-	-	35	35	35	45

<sup>1</sup> 7 am–6 pm Monday to Saturday and 8 am–6 pm Sunday and public holidays  
<sup>2</sup> 6 pm–10 pm Monday to Sunday  
<sup>3</sup> 10 pm–7 am Monday to Saturday and 10 pm–8 am Sunday and public holidays

### 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 Monday 4 September, Tuesday 5 September and Thursday 7 September 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 day, evening, and night periods over three days. Where possible, throughout each measurement the operator quantified the contribution of each significant noise source.

Where the 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 N1

Noise monitoring at location N1 was conducted on Monday 4 September 2023, Tuesday 5 September 2023 and Thursday 7 September 2023. Noise from the quarry was inaudible during the day, evening, and night monitoring periods, with the ambient noise environment dominated by wind, birds, insects, barking dogs and a passing train. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring. The results and observations taken during the monitoring events at Location N1 are presented in **Table 4-1**.

**Table 4-1: Noise survey results and observations for Location N1**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Lynwood Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LA1	LAeq	LA90						
04-09-23	12:58pm to 1:13pm (Day)	48.1	41.3	35.6	WD: - WS: - Rain: -	Wind/trees 39-46 Birds 35-50 Dog barking 34-45 Quarry inaudible	<26	35	n/a	n/a
05-09-23	6:07pm to 6:22pm (Evening)	59.2	51.5	46.1	WD: 57° WS: 3.2 m/s Rain: Nil	Wind/dog barking continuously 44-46 Quarry inaudible	<36 <sup>1</sup>	35	n/a	n/a
07-09-23	5:27am to 5:42am (Night)	48.3	39.8	30.3	WD: n/a WS: 0 m/s Rain: Nil	Birds 59 Train 41-47 Insects 30-35 Quarry inaudible	<20	35	<48 <sup>2</sup>	45

<sup>1</sup> Exceedance 1dB is considered negligible.

<sup>2</sup> Measured LA1 was dominated by birds and a passing train.



## 4.2 Location N2

Noise monitoring at location N2 was conducted on Monday 4 September 2023, Tuesday 5 September 2023 and Thursday 7 September 2023. Noise from the quarry was inaudible during the day, evening, and night monitoring periods, with the ambient noise environment dominated by birds, insects, wind, aircraft, a passing train, and motorway traffic. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring. The results and observations taken during the monitoring events at Location N2 are presented in **Table 4-12**.

**Table 4-2 Noise survey results and observations for Location N2**

Date	Time	Descriptor (dBA)				Meteorology	Apparent Noise Source, Description and SPL (dBA)	Lynwood Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LA1	LAmax	LAeq	LA90						
04-09-23	2:11pm to 2:26pm (Day)	42.9	50.4	34.6	32	WD: 215° WS: 1.5 m/s Rain: Nil	Background road traffic 29-34 Birds/insects 30-34 Passing train 34-50 Quarry inaudible	<22	35	n/a	n/a
05-09-23	7:10pm to 7:25pm (Evening)	54.2	58.7	45.6	42.4	WD: 271° WS: 1.2 m/s Rain: Nil	Background road traffic/wind/frogs 44-56 Aircraft 52-56 Quarry inaudible	<32	37	n/a	n/a
07-09-23	6:21am to 6:36am (Night)	53.5	59.5	50.3	48.6	WD: n/a WS: 0 m/s Rain: Nil	Background motorway traffic/birds 46-59 Quarry inaudible	<36 <sup>1</sup>	36	<54 <sup>2</sup>	46

<sup>1</sup> Contribution of quarry operation was estimated to be below 46 dBA based on the observed SPL.

<sup>2</sup> Measured LA1 was dominated by birds and motorway traffic.

### 4.3 Location N3

Noise monitoring at location N3 was conducted on Monday 4 September 2023, Tuesday 5 September 2023 and Thursday 7 September 2023. Noise from the quarry was inaudible during the day, evening, and night monitoring periods, with the ambient noise environment dominated by wind, birds, frogs and background motorway traffic. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring. The results and observations taken during the monitoring events at Location N3 are presented in **Table 4-13**.

**Table 4-3: Noise survey results and observations for Location N3**

Date	Time	Descriptor (dBA)				Meteorology	Apparent Noise Source, Description and SPL (dBA)	Lynwood Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LA1	LAmax	LAeq	LA90						
04-09-23	2:49pm to 3:04pm (Day)	47.8	58.2	39.1	34.7	WD: n/a WS: 0 m/s Rain: Nil	Birds (continuous squawking) 31-58 Quarry inaudible	<25	35	n/a	n/a
05-09-23	7:35pm to 7:50pm (Evening)	54.2	57.6	47.9	44.2	WD: 271° WS: 2.4 m/s Rain: Nil	Background road traffic/wind/frogs 40-57 Quarry inaudible	<34	35	n/a	n/a
07-09-23	6:45am to 7:00am (Night)	50.9	62.9	46.3	43.6	WD: n/a WS: 0 m/s Rain: Nil	Background road traffic 44-45 Birds 42-62 Quarry inaudible	<34	<36	<51 <sup>1</sup>	47

<sup>1</sup> Measured LA1 was dominated by birds and road traffic.

#### 4.4 Location N4

Noise monitoring at location N4 was conducted on Monday 4 September 2023, Tuesday 5 September 2023 and Thursday 7 September 2023. Noise from the quarry was inaudible during the day, evening, and night monitoring periods, with the ambient noise environment dominated by birds, wind, and road traffic. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring. The results and observations taken during the monitoring events at location N4 are presented in **Table 4-1**.

**Table 4-4: Noise survey results and observations for Location N4**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Lynwood Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LA1	LAeq	LA90						
04-09-23	1:43pm to 1:58pm (Day)	44.1	36	31.7	WD: 211° WS: 1.4 m/s Rain: Nil	Birds 32-37 Quarry inaudible	<22	37	n/a	n/a
05-09-23	6:46pm to 7:01pm (Evening)	48.6	40.7	35.7	WD: 283° WS: 2.4 m/s Rain: Nil	Background road traffic/wind 37-39 Train 40-47 Quarry inaudible	<26	37	n/a	n/a
07-09-23	6:00am to 6:15am (Night)	51.1	45.6	42.9	WD: n/a WS: 0 m/s Rain: Nil	Background road traffic/birds 40-58 Quarry inaudible	<33	36	<51 <sup>1</sup>	47

<sup>1</sup> Measured LA1 was dominated by birds and road traffic.

## 5. CONCLUSION

This NMA was completed by Ramboll at the Holcim Lynwood Quarry, Marulan, NSW as a quarterly requirement of the NMP. Monitoring was carried out on Monday 4 September 2023, Tuesday 5 September 2023 and Thursday 7 September 2023 at four locations selected as representative to the sensitive receptors at the surroundings to Lynwood Quarry. No audible noise from quarry operations was recorded at any of the four locations during the day, evening, and night periods. A negligible exceedance was observed at N1 during the evening monitored period with an estimated quarry contribution of 36 LAeq (15min) dBA against a criteria of 35 LAeq (15min) dBA. The LA1 quarry contribution also exceeded the LA1(1min) (dBA) criteria for all locations but it was noted that LA1 was dominated by birds, road traffic and/or a passing train at each location.

The results presented in this NMA show compliance with the relevant noise criteria at the Holcim Lynwood Quarry, Marulan, NSW, except for the evening monitored period at N1 and the night LA1 contributions at all locations.

## 6. REFERENCES

Holcim Australia (2019) *Lynwood Quarry, Noise Management Plan*.

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# **QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 4 2023 LYNWOOD QUARRY, MARULAN, NSW**

**QUARTERLY NOISE MONITORING ASSESSMENT –  
QUARTER 4 2023  
LYNWOOD QUARRY, MARULAN, NSW**

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Description **Data collected on 6, 7 and 8 December 2023 for the quarterly period ending  
December 2023 at Marulan, NSW, as part of the noise monitoring program**

## CONTENTS

<b>Abbreviations and Definitions</b>	<b>2</b>
<b>1. Overview</b>	<b>3</b>
1.1 Project Driver	3
1.2 Site Location and Sensitive Receptors	3
<b>2. Noise Criteria</b>	<b>5</b>
<b>3. Methodology</b>	<b>6</b>
<b>4. Results and Discussion</b>	<b>7</b>
4.1 Location N1	7
4.2 Location N2	8
4.3 Location N3	9
4.4 Location N4	10
<b>5. Conclusion</b>	<b>11</b>
<b>6. References</b>	<b>12</b>
<b>Tables</b>	
Table 2-1: Monitoring locations and noise criteria	5
Table 4-1: Noise survey results and observations for Location N1	7
Table 4-2 Noise survey results and observations for Location N2	8
Table 4-3: Noise survey results and observations for Location N3	9
Table 4-4: Noise survey results and observations for Location N4	10



## 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>SPL</b>	The Sound Pressure Level. Sound pressure is the fluctuation in air pressure, from the steady atmospheric pressure, created by sound. The sound pressure level is the sound pressure expressed on a decibel scale.

Source: Noise Guide for Local Government (NSW EPA, 2023)

# 1. OVERVIEW

## 1.1 Project Driver

Ramboll Australia Pty Ltd (Ramboll) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Lynwood Quarry (“the quarry”) at Marulan, NSW.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPfI) (NSW EPA, 2017).
- Lynwood Quarry Noise Management Plan (NMP) (Holcim Australia, 2019).
- Environment Protection Licence (EPL) number 12939 (NSW EPA, 2021).
- Development Consent DA 128-5-2005 (Minister for Planning, 2017).
- Australian Standard AS 1055:2018 Acoustics — Description and measurement of environmental noise (Standards Australia, 2018).
- IEC 60942 Ed. 3.0 b:2003 Electroacoustics - Sound calibrators (Standards Australia, 2003).

This NMA has been undertaken for the quarterly period July to September 2023, and forms part of the monitoring program to determine compliance with conditions of the Development Consent.

## 1.2 Site Location and Sensitive Receptors

The quarry is located at 278 Stoney Creek Road, approximately 4 km to the west of the Marulan railway station and town centre. Sensitive receptors surrounding the quarry are primarily rural and residential (to the west of the site). The Hume Highway is located to the east and south of the quarry. Highway traffic (Hume Highway) is a dominant noise source.

The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan in **Figure 1**.



**Legend**

- Noise monitoring location
- Residence/noise assessment location



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

## 2. NOISE CRITERIA

**Table 2-1** includes the applicable noise criteria outlined in the Development Consent and the EPL for the 16 residential receivers surrounding the quarry (L1–L16), and the four monitoring locations adopted from the NMP that are deemed representative and applicable for this NMA (N1–N4). It should be noted that the original location of N3 (on the northern boundary of 16038 Hume Highway, Marulan) continues to be inaccessible and as such N3 has been relocated to a nearby residential receiver approximately 900 m to the west on Munro Road, Marulan (**Figure 1**) where all future monitoring will take place. This revised location is deemed representative and applicable for this NMA.

**Table 2-1: Monitoring locations and noise criteria**

EPL ID	Receiver Description	Monitoring Locations		Day <sup>1</sup>	Evening <sup>2</sup>	Night <sup>3</sup>	Night <sup>3</sup>
		NMP ID	Address	LAeq (15min)	LAeq (15min)	LAeq (15min)	LA1 (1min)
				dBA			
L1	West of the Granite Pit.	N1	1114 Carrick Road, Marulan	35	35	35	45
L2	Northeast of the site	-	-	35	35	35	45
L3	Northeast of the site	-	-	35	35	35	45
L4	East of the site in Marulan	-	-	35	37	35	46
L5	East of the site in Marulan	-	-	35	35	35	46
L6	East of the site in Marulan	N2	End of Maclura Drive, Marulan	35	37	36	46
L7	East of the site in Marulan	-	-	38	38	35	55
L8	East of the site in Marulan	-	-	39	38	36	55
L9	East of the site in Marulan	-	-	39	39	37	56
L10	Southeast of the site in Old Marulan	-	-	42	42	40	53
L11	South of the site	N3	127 Munro Rd, Carrick	35	35	36	47
L12	East of the site in Marulan	N4	Corner of Dorsett and Suffolk Road, Marulan	37	37	36	47
L13	East of the site in Marulan	-	-	40	38	37	47
L14	South of the site	-	-	35	35	35	47
L15	South of the site	-	-	35	35	35	47
L16	Northeast of the site	-	-	35	35	35	45

<sup>1</sup> 7 am–6 pm Monday to Saturday and 8 am–6 pm Sunday and public holidays  
<sup>2</sup> 6 pm–10 pm Monday to Sunday  
<sup>3</sup> 10 pm–7 am Monday to Saturday and 10 pm–8 am Sunday and public holidays

### 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 6, Thursday 7, and Friday 8 December 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 day, evening, and night periods over three days. Where possible, throughout each measurement the operator quantified the contribution of each significant noise source.

Where the 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 N1

Noise monitoring at location N1 was conducted on Wednesday 6, Thursday 7, and Friday 8 December 2023. Noise from the quarry was inaudible during the day, evening, and night monitoring periods, with the ambient noise environment dominated by birds, a barking dog, a cow, and children screaming. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring. The results and observations taken during the monitoring events at Location N1 are presented in **Table 4-1**.

**Table 4-1: Noise survey results and observations for Location N1**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Lynwood Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LA1	LAeq	LA90						
08-12-23	7:42am to 7:57am (Day)	49.3	38.0	30.5	WD: n/a WS: 0 m/s Rain: Nil	Dog barking 33-36 Birds 33-60 Quarry inaudible	<21	35	n/a	n/a
07-12-23	6:05pm to 6:20pm (Evening)	49.3	38.2	28.1	WD: 357° WS: 0.8 m/s Rain: Nil	Dog barking 34-43 Birds 31-59 Children screaming nearby residence 27-32 Quarry inaudible	<18	35	n/a	n/a
06-12-23	6:09am to 6:24am (Night)	47.7	37.9	32.9	WD: n/a WS: 0 m/s Rain: Nil	Birds 33-61 Cow 38-44 Quarry inaudible	<23	35	<48 <sup>2</sup>	45

<sup>1</sup> Measured LA1 was dominated by birds and a barking dog.

## 4.2 Location N2

Noise monitoring at location N2 was conducted on Wednesday 6, Thursday 7, and Friday 8 December 2023. Noise from the quarry was inaudible during the day, evening, and night monitoring periods, with the ambient noise environment dominated by motorway traffic, birds, dogs, and a passing train. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring. The results and observations taken during the monitoring events at Location N2 are presented in **Table 4-12**.

**Table 4-2 Noise survey results and observations for Location N2**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Lynwood Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LA1	LAeq	LA90						
06-12-23	7:26am to 7:41am (Day)	48.3	40.4	35.9	WD: n/a WS: 0 m/s Rain: Nil	Background motorway 33-35 Birds 33-59 Quarry inaudible	<26	35	n/a	n/a
07-12-23	7:06pm to 7:21pm (Evening)	47.2	39.7	34.7	WD: n/a WS: 0 m/s Rain: Nil	Background motorway 31-33 Train horn 45 Train 47-49 Dogs 37-45 Quarry inaudible	<25	37	n/a	n/a
08-12-23	6:03am to 6:18am (Night)	57.9	46.1	39.9	WD: n/a WS: 0 m/s Rain: Nil	Background motorway 36-44 Birds 44-64 Quarry inaudible	<30	36	<58 <sup>1</sup>	46

<sup>1</sup> Measured LA1 was dominated by background motorway traffic and birds.

### 4.3 Location N3

Noise monitoring at location N3 was conducted on Wednesday 6, Thursday 7, and Friday 8 December 2023. Noise from the quarry was inaudible during the day, evening, and night monitoring periods, with the ambient noise environment dominated by motorway traffic and birds. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring. The results and observations taken during the monitoring events at Location N3 are presented in **Table 4-13**.

**Table 4-3: Noise survey results and observations for Location N3**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Lynwood Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LA1	LAeq	LA90						
06-12-23	10:09am to 10:24am (Day)	52.1	41.9	37.5	WD: n/a WS: 0 m/s Rain: Nil	Background motorway 35-37 Birds 37-60 Quarry inaudible	<28	35	n/a	n/a
07-12-23	7:36pm to 7:51pm (Evening)	48.7	41.6	36.9	WD: n/a WS: 0 m/s Rain: Nil	Background motorway 39-42 Birds 33-57 Quarry inaudible	<27	35	n/a	n/a
08-12-23	5:36am to 5:51am (Night)	57.9	47.4	37.8	WD: n/a WS: 0 m/s Rain: Nil	Background motorway 34-36 Birds 36-63 Quarry inaudible	<28	<36	<58 <sup>1</sup>	47

<sup>1</sup> Measured LA1 was dominated by background motorway traffic and birds.



#### 4.4 Location N4

Noise monitoring at location N4 was conducted on Wednesday 6 and Thursday 7 December 2023. Noise from the quarry was inaudible during the day, evening, and night monitoring periods, with the ambient noise environment dominated by motorway traffic, birds, barking dogs, and a trucks. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring. The results and observations taken during the monitoring events at location N4 are presented in **Table 4-1**.

**Table 4-4: Noise survey results and observations for Location N4**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Lynwood Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LA1	LAeq	LA90						
06-12-23	7:02am to 7:13am (Day)	54.3	45.2	38.5	WD: n/a WS: 0 m/s Rain: Nil	Background motorway 36-39 Birds 36-63 Truck 48-55 Quarry inaudible	<29	37	n/a	n/a
07-12-23	6:40pm to 6:55pm (Evening)	44.9	36.0	29.5	WD: n/a WS: 0 m/s Rain: Nil	Background motorway 27-35 Birds 28-64 Dogs barking 30-32 Quarry inaudible	<20	37	n/a	n/a
06-12-23	6:45am to 7:00am (Night)	46.8	41.8	39.4	WD: n/a WS: 0 m/s Rain: Nil	Background motorway 35-37 Birds 35-58 Quarry inaudible	<29	36	<47	47

## 5. CONCLUSION

This NMA was completed by Ramboll at the Holcim Lynwood Quarry, Marulan, NSW as a quarterly requirement of the NMP. Monitoring was carried out on Wednesday 6, Thursday 7 and Friday 8 December 2023 at four locations selected as representative to the sensitive receptors at the surroundings to Lynwood Quarry. No audible noise from quarry operations was recorded at any of the four locations during the day, evening, and night periods. The LA1 quarry contribution also exceeded the LA1(1min) (dBA) criteria for all locations but it was noted that LA1 was dominated by birds, barking dogs and or road traffic at each location.

The results presented in this NMA show compliance with the relevant noise criteria at the Holcim Lynwood Quarry, Marulan, NSW, except for the night LA1 contributions at all locations.

## 6. REFERENCES

Holcim Australia (2019) *Lynwood Quarry, Noise Management Plan*.

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Standards Australia (2003) *AS 60942:2003 Electroacoustics - Sound calibrators*. Australian Standard.

# **Appendix 2**

## **Environmental Monitoring Results**

Long Term Surface Water Results

Date	EC	pH	Suspended Solids	Total Oil and Grease	Total Phosphorous	Total Nitrogen	Flow Observations
	µs/cm		mg/L	mg/L	mg/L	mg/L	
<b>ANZECC Criteria</b>	<b>N/A</b>	<b>6.5 to 7.5</b>	<b>50</b>	<b>10</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
<b>SW5</b>							
1/07/2004	740	6.9	NS	NS	0.01	3	NS
3/08/2004	793	6.8	NS	NS	0.01	3.4	NS
3/09/2004	NS	NS	NS	NS			NS
8/10/2004	281	6.2	NS	NS	0.02	1.4	NS
2/11/2004	270	6.9	NS	NS	0.02	1.4	NS
30/11/2004	NS	NS	NS	NS	0.01	1.3	NS
6/01/2005	272	7	NS	NS	0.02	2	NS
2/02/2005	266	6.3	NS	NS	0.08	2	NS
2/03/2005	235	6.7	NS	NS	0.02	1.2	NS
8/04/2005	363	6.5	NS	NS	0.01	0.87	NS
5/05/2005	395	6.7	NS	NS	0.02	0.88	NS
2/06/2005	405	6.8	NS	NS	0.02	1.1	NS
6/07/2005	333	6.7	NS	NS	0.01	1	NS
3/08/2005	498	6.6	NS	NS	0.01	0.81	NS
8/09/2005	547	6.8	NS	NS	0.01	0.81	NS
13/10/2005	301	6.7	NS	NS	0.01	1	NS
2/11/2005	379	6.6	NS	NS	0.01	0.99	NS
1/12/2005	279	6.4	NS	NS	0.01	1.1	NS
5/01/2006	919	6.4	NS	NS	0.02	1.6	NS
2/02/2006	574	6.7	NS	NS	0.04	1.6	NS
2/03/2006	708	7	NS	NS	0.07	2	NS
7/04/2006	828	7.3	NS	NS	0.01	1.6	NS
3/05/2006	910	7.1	NS	NS	0.01	2.1	NS
8/06/2006	287	6	NS	NS	0.03	1.8	NS
6/07/2006	399	6.4	NS	NS	0.01	0.75	NS
3/08/2006	566	6.6	NS	NS	0.01	0.95	NS
7/09/2006	635	6.8	NS	NS	0.01	1.3	NS
5/10/2006	732	6.5	NS	NS	0.01	1.3	NS
2/11/2006	946	6.8	NS	NS	0.03	2	NS
4/12/2006	1362	6.8	NS	NS	0.05	2.6	NS
11/01/2007	310	6.4	NS	NS	0.02	2.2	NS
9/02/2007	416	6.8	NS	NS	0.02	2.8	NS
2/03/2007	468	6.3	NS	NS	0.01	1.6	NS
13/04/2007	469	6.3	NS	NS	0.02	1.4	NS
2/05/2007	491	6.6	NS	NS	0.01	1.4	NS
6/06/2007	506	6.6	NS	NS	0.02	1.9	NS
9/07/2007	326	7.3	NS	NS	0.01	1.4	NS
15/08/2007	748	6.5	NS	NS	0.02	0.88	NS
6/09/2007	845	6.9	NS	NS	0.01	0.88	NS
12/10/2007	1049	6.6	NS	NS	0.02	1.1	NS
8/11/2007	272	6.2	NS	NS	0.03	1.3	NS
6/12/2007	530	6.2	NS	NS	0.03	1.1	NS
10/01/2008	398	6.4	NS	NS	0.02	1.4	NS
7/02/2008	386	6.3	NS	NS	0.01	1.2	NS
6/03/2008	445	6.6	NS	NS	0.03	1.3	NS
11/04/2008	414	6.5	NS	NS	0.01	1.3	NS
8/05/2008	441	6.7	NS	NS	0.12	1.1	NS
4/06/2008	442	6.7	NS	NS	0.01	1.2	NS
3/07/2008	454	7.3	NS	NS	0.03	1.2	NS
20/02/2009	404	6.5	NS	NS	0.01	1.8	NS
30/07/2009	319	6.5	NS	NS	0.02	0.99	NS
8/01/2010	378	5.8	NS	NS	0.02	2.3	NS
1/07/2010	333	6.2	NA	NA	0.05	0.96	
19/07/2010	333	6.2	NS	NS	0.01	0.96	NS
1/12/2010	464	6.3	9	1	0.07	1.6	Moderate
15/12/2010	464	6.3	NS	NS	0	1.6	Moderate
1/01/2011	778	6.2	4	1	0.05	1.2	Moderate
12/01/2011	778	6.2	NS	NS	0	1.2	Moderate

Long Term Surface Water Results

Date	EC	pH	Suspended Solids	Total Oil and Grease	Total Phosphorous	Total Nitrogen	Flow Observations
	µs/cm		mg/L	mg/L	mg/L	mg/L	
<b>ANZECC Criteria</b>	<b>N/A</b>	<b>6.5 to 7.5</b>	<b>50</b>	<b>10</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
1/02/2011	618	6.1	14	1	0.13	1.4	Low
10/02/2011	618	6.1	NS	NS	0	1.4	Low
1/03/2011	569	6.2	7	1	0.05	1.2	Low
10/03/2011	569	6.2	NS	NS	0	1.2	Low
1/04/2011	944	6	5	1	0.03	0.8	Low
6/04/2011	944	6	NS	NS	0	0.8	NS
1/05/2011	1000	6.7	10	1	0.03	0.74	Low
1/06/2011	932	6.8	13	1	0.03	0.73	Low
13/07/2011	865	6.6	7	1	0.03	0.75	Low
12/08/2011	820	6.6	17	1	0.04	0.79	Moderate
8/09/2011	603	6.6	40	1	0.07	1.1	Moderate
6/10/2011	674	6.2	33	1	0.07	1.1	Low
7/11/2011	725	6.7	9	1	0.05	0.98	Low
9/12/2011	736	7.2	29	1	0.06	1	Moderate
10/01/2012	766	6.6	25	1	0.07	1.1	Moderate
13/02/2012	448	6.8	810	1	0.24	2.7	Moderate
16/03/2012	208	7.5	140	1	0.1	1.3	Flood
16/04/2012	146	6	530	1	0.13	1.5	Moderate
14/05/2012	335	7.1	97	1	0.08	1.2	Moderate
13/06/2012	380	6.2	34	1	0.06	1.3	Moderate
12/07/2012	1137	6.5	52	1	0.04	1.1	Moderate
24/08/2012	760	6.8	22	1	0.04	1	Low
18/09/2012	795	6.3	18	1	0.04	1.1	Low
30/10/2012	141.5	6.6	36	5	0.05	0.9	Very Low
27/11/2012	1461	6.1	10	5	0.05	5.6	Very Low
17/12/2012	968	5.3	15	5	0.05	2.6	No Flow
29/01/2013	202.8	5.6	140	5	0.07	2.5	Fast Flow
28/02/2013	202.3	6.4	76	5	0.09	2	Med to Fast
21/03/2013	480	6.1	17	5	0.09	2.1	No Flow
18/04/2013	402.1	6.7	17	5	0.09	2.5	No Flow
22/05/2013	518	7.3	7	5	0.07	2.5	No Flow
19/06/2013	1137	6.5	52	1	0.04	1.1	Moderate
19/07/2013	447	7.34	100	5	0.05	1.4	NS
19/08/2013	504	7.43	15	5	0.05	0.4	NS
24/09/2013	442	6.62	25	5	0.05	1.2	NS
26/11/2013	283	6.59	71	5	0.08	2.7	NS
21/01/2014	235	6	28	1	0.12	2.2	NS
18/02/2014	265	6	48	1	0.11	1.7	NS
20/03/2014	361	6	56	1	0.11	1.4	NS
29/04/2014	600	6	20	1	0.08	1.8	NS
21/05/2014	622	6	23	1	0.1	1.6	NS
16/06/2014	875	6	43	1	0.04	0.86	NS
18/07/2014	75	7	11	1	0.04	0.83	NS
22/08/2014	355	6	39	1	0.07	1.4	NS
19/09/2014	356	6.7	25	1	0.06	1.4	NS
24/10/2014	199	6	21	1	0.08	1.4	NS
20/11/2014	330	6.4	39	1	0.11	1.9	NS
17/12/2014	273	6.2	62	1	0.09	1.7	NS
20/01/2015	340	6.4	14	1	0.08	1.8	NS
20/02/2015	308	6.7	29	1	0.1	1.4	NS
20/03/2015	383	6.9	7	1	0.09	1.3	NS
20/04/2015	319	6.3	130	1	0.1	2.1	NS
18/05/2015	533	6.9	13	1	0.05	1.1	NS
21/07/2015	326	6	11	1	0.04	1.29	NS
27/08/2015	172	6.2	44	1	0.08	2.02	NS
16/09/2015	224	5.9	34	1	0.1	1.15	NS
19/10/2015	261	6.5	15	1	0.08	1.46	NS
20/11/2015	986	6.4	4	1	0.02	0.75	NS
17/12/2015	NS	NS	NS	NS	NS	NS	NS
20/01/2016	1360	6.2	7	1	0.06	1.17	NS

Long Term Surface Water Results

Date	EC	pH	Suspended Solids	Total Oil and Grease	Total Phosphorous	Total Nitrogen	Flow Observations
	µs/cm		mg/L	mg/L	mg/L	mg/L	
<b>ANZECC Criteria</b>	<b>N/A</b>	<b>6.5 to 7.5</b>	<b>50</b>	<b>10</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
23/02/2016	556	7.1	12	1	0.08	1.65	NS
20/04/2016	NS	NS	NS	NS	NS	NS	NS
24/05/2016	NS	NS	NS	NS	NS	NS	NS
23/06/2016	354	6.4	18	1	0.04	1.98	NS
21/07/2016	501	6.8	23	1	0.07	2.78	Flood
22/08/2016	603	7.1	6	1	0.03	1.14	Low
27/09/2016	477	7.4	8	1	0.09	2.27	Moderate
24/10/2016	905	7	7	1	0.02	1	Low
21/11/2016	NS	NS	NS	NS	NS	NS	ponding no flow no sample
15/12/2016	NS	NS	NS	NS	NS	NS	pooling no flow
20/03/2017	908	7.5	23	1	0.05	2.59	Moderate
20/04/2017	1200	7.7	4	1	0.02	1.22	Low
25/05/2017	1040	7.62	20	1	0.03	1.34	Low
19/06/2017	1080	7.6	13	1	0.03	2.66	Low
25/07/2017	1280	7.89	4	1	0.02	0.74	Low
24/08/2017	1240	7.69	5	1	0.02	1.18	Low
22/09/2017	1340	7.66	6	1	0.02	0.92	No flow. Pooling
19/01/2018	ND	ND	ND	ND	ND	ND	No flow
14/02/2018	ND	ND	ND	ND	ND	ND	No flow
15/03/2018	707	7.54	5	1	0.05	1.33	Low
20/04/2018	818	6.98	95	1	0.51	4.34	Low
18/05/2018	871	7.63	3	1	0.03	1.4	Low
14/06/2018	846	7.66	3	1	0.03	1.36	Low
16/07/2018	NS	NS	NS	NS	NS	NS	Low
13/08/2018	1110	7.73	13	1	0.07	1.74	Low
17/09/2018	ND	ND	ND	ND	ND	ND	Dry
23/10/2018	ND	ND	ND	ND	ND	ND	Dry
15/11/2018	ND	ND	ND	ND	ND	ND	Dry
17/12/2018	892	7.05	13	NS	0.03	3.18	Low
21/01/2019	NS	NS	NS	NS	NS	NS	NF
20/02/2019	NS	NS	NS	NS	NS	NS	NF
18/03/2019	NS	NS	NS	NS	NS	NS	NF
29/04/2019	NS	NS	NS	NS	NS	NS	NF
30/05/2019	NS	NS	NS	NS	NS	NS	NF
14/06/2019	536	7	9	1	0.04	0.86	F
11/07/2019	1000	7.44	5	1	0.02	0.71	F
20/08/2019	NS	NS	NS	NS	NS	NS	NF
18/09/2019	684	6.81	17	1	0.63	1.32	F
15/10/2019	902	7.48	5	1	0.04	NF	
13/11/2019	ND	ND	ND	ND	ND	ND	NF
12/12/2019	ND	ND	ND	ND	ND	ND	NF
3/04/2020	*597	*7.12	*5	*10	*0.05	*1.6	NT
20/05/2020	512	7.12	4	5	0.13	3.4	F
11/06/2020	748	7.64	34	7	0.15	3.6	F
30/07/2020	554	7.01	11	5	0.02	0.86	F
25/08/2020	489.3	7.58	5.8	5	0.02	1.11	F
3/09/2020	557	7.49	45	5	0.02	1.1	F
30/10/2020	561	7.26	13	5	0.06	1.1	F
19/11/2020	542	6.82	17	5	0.05	1	F
14/12/2020	645	7.41	12	5	0.03	0.2	F
20/01/2021	901	7.06	8.8	5	0.07	1.5	F
23/02/2021	1020	7.5	6.6	5	0.03	0.5	F
10/03/2021	1050	7.6	9.2	5	0.03	0.96	F
9/04/2021	771	7.4	7.9	5	0.5	0.2	F
7/05/2021	111	7.4	27	5	0.03	0.5	F
2/06/2021	912	7.3	3.4	5	0.01	0.8	NF
1/07/2021	896	7.6	4.4	5	0.02	0.84	NF
2/08/2021	1410	7.3	12	5	0.02	0.2	F
1/09/2021	379	7.5	11	5	0.03	2.37	NF
6/10/2021	475	8	2.7	13	0.01	0.2	F

Long Term Surface Water Results

Date	EC	pH	Suspended Solids	Total Oil and Grease	Total Phosphorous	Total Nitrogen	Flow Observations
	µs/cm		mg/L	mg/L	mg/L	mg/L	
<b>ANZECC Criteria</b>	<b>N/A</b>	<b>6.5 to 7.5</b>	<b>50</b>	<b>10</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
3/11/2021	609	7.9	13	5	0.03	0.9	F
9/12/2021	506	7	10	5	0.02	2.2	NF
6/01/2022	758	7.2	14	12	0.03	2.9	NF
1/02/2022	326	7.1	7	5	0.11	0.3	NF
9/03/2022	NA	7	10	5	0.04	1	F
5/04/2022	441	7.3	6	6.4	0.03	3.7	NF
3/05/2022	418	7.7	11	5	0.03	0.88	NF
2/06/2022	384	8	8	5	0.02	0.85	F
6/07/2022	181	8.2	8	5	0.17	1	F
3/08/2022	311	8.6	7	6	0.03	1.18	F
7/09/2022	421	8.4	5	5	0.04	0.2	NF
5/10/2022	390	7.4	5	5	0.02	0.2	NF
9/11/2022	310	8.2	12	25	0.05	49	NF
6/12/2022	434	8.1	8	5	0.05	1.3	F
4/01/2023	707	8.2	8	5.6	0.01	1.9	NF
8/02/2023	326	8.3	18	17	0.02	0.4	NF
1/03/2023	NA	8.3	5	25	0.01	4.2	NF
4/04/2023	441	8.5	5	9.4	0.02	0.2	NF
2/05/2023	418	8	10	17	0.02	0.2	NF
1/06/2023	384	7	5	15	0.01	0.2	NF
4/07/2023	181	9	8	5	0.01	2.1	NF
1/08/2023	311	8.2	6	5	0.01	1.1	NF
9/06/2023	421	7	5	9.4	0.01	0.4	NF
10/05/2023	390	8.2	26	15	0.03	0.9	NF
8/11/2023	310	8.2	9	7.9	0.01	0.2	NF
8/12/2023	434	7.3	10	5	0.02	0.7	NF
<b>Average</b>	<b>575.66</b>	<b>6.89</b>	<b>32.14</b>	<b>3.74</b>	<b>0.05</b>	<b>1.69</b>	-
<b>Minimum</b>	<b>75.00</b>	<b>5.30</b>	<b>2.70</b>	<b>1.00</b>	<b>0.00</b>	<b>0.20</b>	-
<b>Maximum</b>	<b>1461.00</b>	<b>9.00</b>	<b>810.00</b>	<b>25.00</b>	<b>0.63</b>	<b>49.00</b>	-
<b>SW6</b>							
1/07/2004	2316	7.1	NS	NS	0.01	0.95	NS
3/08/2004	2268	7.1	NS	NS	0.01	0.41	NS
3/09/2004	3255	9.7	NS	NS	0.01	0.47	NS
8/10/2004	488	6.9	NS	NS	0.01	1.1	More water than previous samples
2/11/2004	277	7	NS	NS	0.01	1.2	NS
30/11/2004	NS	NS	NS	NS	0.01	0.89	NS
6/01/2005	575	7	NS	NS	0.01	1	NS
2/02/2005	248	6.4	NS	NS	0.05	1.9	NS
2/03/2005	588	6.5	NS	NS	0.01	0.88	NS
8/04/2005	682	7.2	NS	NS	0.01	0.79	NS
5/05/2005	887	6.9	NS	NS	0.02	0.59	NS
2/06/2005	1290	7.1	NS	NS	0.01	0.95	NS
6/07/2005	352	6.8	NS	NS	0.01	1	NS
3/08/2005	632	6.9	NS	NS	0.01	0.68	NS
8/09/2005	860	7.5	NS	NS	0.01	0.54	NS
13/10/2005	529	7	NS	NS	0.01	0.73	NS
2/11/2005	821	7.2	NS	NS	0.01	0.66	NS
1/12/2005	323	6.7	NS	NS	0.01	1.1	NS
5/01/2006	1052	6.6	NS	NS	0.02	0.84	NS
2/02/2006	667	7	NS	NS	0.02	1.2	NS
2/03/2006	1176	6.9	NS	NS	0.04	0.97	Brown oil film on surface
7/04/2006	1730	7.3	NS	NS	0.01	0.67	NS
3/05/2006	1910	7	NS	NS	0.01	0.61	NS
8/06/2006	2091	6.9	NS	NS	0.01	0.44	NS
6/07/2006	425	6.2	NS	NS	0.02	0.43	NS
3/08/2006	576	6.7	NS	NS	0.01	0.86	NS
7/09/2006	818	6.9	NS	NS	0.01	0.86	NS
5/10/2006	934	6.9	NS	NS	0.01	0.88	NS
2/11/2006	1055	7.2	NS	NS	0.02	1	NS



Long Term Surface Water Results

Date	EC	pH	Suspended Solids	Total Oil and Grease	Total Phosphorous	Total Nitrogen	Flow Observations
	µs/cm		mg/L	mg/L	mg/L	mg/L	
<b>ANZECC Criteria</b>	<b>N/A</b>	<b>6.5 to 7.5</b>	<b>50</b>	<b>10</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
4/12/2006	1303	7.2	NS	NS	0.03	1	NS
11/01/2007	412	6.6	NS	NS	0.01	1.4	NS
9/02/2007	890	6.9	NS	NS	0.02	1	NS
2/03/2007	309	6.7	NS	NS	0.01	1.3	NS
13/04/2007	612	6.7	NS	NS	0.02	1	NS
2/05/2007	697	6.9	NS	NS	0.01	0.99	NS
6/06/2007	984	6.7	NS	NS	0.02	0.75	NS
9/07/2007	485	7.3	NS	NS	0.01	1.2	NS
15/08/2007	644	7	NS	NS	0.02	0.77	NS
6/09/2007	1260	6.9	NS	NS	0.01	0.66	NS
12/10/2007	1557	7	NS	NS	0.03	0.75	NS
8/11/2007	414	6.4	NS	NS	0.02	1	NS
6/12/2007	351	6.7	NS	NS	0.02	0.97	NS
10/01/2008	307	6.6	NS	NS	0.02	0.91	NS
7/02/2008	378	6.9	NS	NS	0.01	1	NS
6/03/2008	644	6.5	NS	NS	0.02	0.73	NS
11/04/2008	886	7	NS	NS	0.01	0.72	NS
8/05/2008	1017	6.9	NS	NS	0.03	0.63	NS
4/06/2008	970	7.2	NS	NS	0.01	0.66	NS
3/07/2008	971	7.4	NS	NS	0.02	0.71	NS
20/02/2009	1197	6.9	NS	NS	0.01	0.85	NS
30/07/2009	1174	7.1	NS	NS	0.02	0.57	NS
8/01/2010	1149	6.5	NS	NS	0.01	1	NS
1/07/2010	1000	7	NA	NA	0.01	0.62	NS
19/07/2010	1000	7	NS	NS	0.01	0.62	NS
1/12/2010	459	6.5	11	1	0.06	1.6	NS
15/12/2010	459	6.5	NS	NS	0	1.6	Moderate
1/01/2011	943	6.9	3	1	0.02	0.98	Moderate
1/02/2011	1182	6.7	4	1	0.07	0.97	Low
1/03/2011	1143	6.7	3	1	0.02	0.89	Low
1/04/2011	973	6.7	3	1	0.02	0.82	Low
1/05/2011	929	7.1	3	1	0.02	0.69	Low
1/06/2011	999	7	2	1	0.01	0.6	Low
13/07/2011	952	7	2	1	0.01	0.55	Low
12/08/2011	1053	7	4	1	0.02	0.58	Moderate
8/09/2011	634	7.3	21	1	0.05	0.91	Moderate
6/10/2011	1003	6.4	4	1	0.01	0.58	Low
7/11/2011	1001	7.3	3	1	0.02	0.76	Low
9/12/2011	1102	7.7	6	1	0.02	0.7	Moderate
10/01/2012	1146	7.1	3	1	0.02	0.72	Low
13/02/2012	916	7.1	9	1	0.06	1	Moderate
16/03/2012	435	7.2	27	1	0.07	1.4	Flood
16/04/2012	2110	6.6	320	1	0.11	1.3	Moderate
14/05/2012	574	7	28	1	0.05	1.1	Moderate
13/06/2012	349	6.5	34	1	0.07	1.2	Moderate
12/07/2012	647	6.5	20	1	0.04	0.91	Moderate
24/08/2012	940	6.6	6	1	0.02	0.78	Low
18/09/2012	1215	6.9	6	1	0.02	0.8	Low
30/10/2012	943	6.3	5	5	0.05	0.8	Med - Low
27/11/2012	1631	6.4	5	5	0.05	1.1	Med-Low
17/12/2012	1096	6.9	7	5	0.05	0.6	Low Flow
29/01/2013	259	5.8	51	5	0.07	1.9	Low Flow
28/02/2013	180	6.4	69	5	0.09	1.4	Low to No Flow
21/03/2013	752	6.5	6	5	0.05	1.5	No to Low Flow
18/04/2013	832	5.5	5	5	0.05	1.9	No to Low Flow
22/05/2013	1048	7.1	5	5	0.05	1.2	No to Low Flow
19/06/2013	1129	7.3	5	5	0.05	0.9	Low to Medium
19/07/2013	634	7.13	46	5	0.05	1.2	NS
19/08/2013	849	7.37	5	5	0.05	0.4	NS
24/09/2013	573	6.89	16	5	0.05	1	NS

Long Term Surface Water Results

Date	EC	pH	Suspended Solids	Total Oil and Grease	Total Phosphorous	Total Nitrogen	Flow Observations
	µs/cm		mg/L	mg/L	mg/L	mg/L	
<b>ANZECC Criteria</b>	<b>N/A</b>	<b>6.5 to 7.5</b>	<b>50</b>	<b>10</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
15/10/2013	766	7.19	5	5	0.05	0.8	NS
26/11/2013	551	6.74	26	5	0.05	1.8	NS
21/01/2014	666	6	4	1	0.04	1.2	NS
18/02/2014	1007	7	4	1	0.02	0.99	NS
20/03/2014	655	6.7	18	1	0.05	1	NS
29/04/2014	702	6.9	9	1	0.04	1.2	NS
21/05/2014	905	6.5	3	1	0.06	0.82	NS
16/06/2014	1029	6.4	4	1	0.01	0.68	NS
18/07/2014	951	6.8	2	1	0.02	0.69	NS
22/08/2014	372	7.3	40	1	0.07	1.4	NS
19/09/2014	244	6.9	10	1	0.03	1	NS
20/11/2014	981	6.6	3	1	0.02	0.92	NS
17/12/2014	404	6.4	80	1	0.08	1.5	NS
20/01/2015	383	6.5	20	1	0.08	1.6	NS
20/02/2015	419	6.8	14	1	0.06	1.1	NS
20/03/2015	816	6.7	3	1	0.03	0.79	NS
20/04/2015	523	6.3	71	1	0.08	1.1	NS
18/05/2015	687	7.2	8	1	0.03	0.92	NS
21/07/2015	332	6.3	16	1	0.06	1.37	Low
27/08/2015	180	6.2	31	1	0.1	1.89	Moderate
16/09/2015	660	6.5	12	1	0.04	1.13	Moderate
19/10/2015	907	6.3	8	1	0.04	0.97	Moderate
20/11/2015	1050	6.7	3	1	0.02	0.78	Low
17/12/2015	1740	6.7	4	1	0.02	0.8	Moderate
20/01/2016	2300	6.6	4	1	0.01	0.61	Low
23/02/2016	678	6.8	6	1	0.04	1.09	Low
20/04/2016	1140	6.9	3	1	0.01	0.82	Low
24/05/2016	935	6.9	2	1	0.01	0.76	Moderate
23/06/2016	361	6.6	16	1	0.05	1.68	Low
21/07/2016	427	6.2	59	1	0.06	2.12	Moderate
22/08/2016	686	6.8	9	1	0.03	0.93	Low
27/09/2016	541	7.2	7	1	0.05	1.95	Moderate
24/10/2016	710	6.8	5	1	0.02	0.83	Low
21/11/2016	710	7	2	1	0.02	0.87	Low
15/12/2016	768	7.1	3	1	0.02	0.9	Low
19/01/2017	859	7.31	3	1	0.02	1.01	Low
17/02/2017	723	7.47	4	1	0.03	1.11	Low
20/03/2017	838	7.27	7	1	0.04	0.98	Low
20/04/2017	1240	7.59	3	1	0.02	0.92	No flow detectable
25/05/2017	1240	7.28	5	1	0.02	0.75	Pooling with no flow
19/06/2017	1120	7.41	2	1	0.02	0.67	Low
25/07/2017	1190	7.67	154	1	0.05	0.9	Low
24/08/2017	1150	7.69	2	1	0.02	0.72	Low
22/09/2017	1270	7.79	3	1	0.02	0.71	Low
25/10/2017	1390	7.8	3	1	0.02	0.76	Low
24/11/2017	821	7.59	4	1	0.03	0.92	No Flow Detectable
19/01/2018	1060	7.38	4	1	0.02	0.94	Low
14/02/2018	1200	7.6	5	1	0.02	0.88	Low
15/03/2018	637	7.35	5	1	0.04	0.94	Low
20/04/2018	1030	7.34	4	1	0.02	0.71	Low
18/05/2018	1060	7.78	2	1	0.01	0.72	Low
14/06/2018	1020	7.86	4	1	0.01	0.7	Low
16/07/2018	1020	8	2	1	0.01	0.68	Low
13/08/2018	987	7.9	2	1	0.02	0.55	Low
17/09/2018	1040	7.83	2	1	0.01	0.7	Low
23/10/2018	1100	6.82	6	1	0.03	0.79	Low
15/11/2018	1230	7.66	7	1	0.03	0.8	Low
17/12/2018	NS	NS	NS	NS	NS	NS	Low
21/01/2019	897	7.6	6	1	0.12	1.47	F
20/02/2019	1450	7.5	36	0.9	0.03	0.96	F

Long Term Surface Water Results

Date	EC	pH	Suspended Solids	Total Oil and Grease	Total Phosphorous	Total Nitrogen	Flow Observations
	µs/cm		mg/L	mg/L	mg/L	mg/L	
<b>ANZECC Criteria</b>	<b>N/A</b>	<b>6.5 to 7.5</b>	<b>50</b>	<b>10</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
18/03/2019	1810	7.6	7	1	0.03	0.88	F
29/04/2019	1510	6.7	5	<1	0.02	0.82	F
30/05/2019	1120	7.4	5	<1	0.89	0.04	F
14/06/2019	533	7	43	<1	0.1	1.21	F
11/07/2019	688	7.18	9	<1	0.04	0.84	F
20/08/2019	746	7.67	5	<1	0.02	0.66	F
18/09/2019	532	7.01	21	<1	0.16	1.52	F
15/10/2019	707	7.26	2	1	0.03	0.74	F
13/11/2019	954	7.79	4	1	0.02	0.67	F
12/12/2019	163	7.58	11	1	0.02	0.69	F
3/04/2020	*906	*6.88	*7.3	*10	*0.13	*2	NT
20/05/2020	498.5	7.19	5.8	5	0.07	1.2	F
11/06/2020	666.9	7.55	25	5	0.04	1.7	F
30/07/2020	325.9	7.4	17	6.8	0.06	12.14	F
25/08/2020	465.9	7.6	2.3	5.6	0.03	0.9	F
3/09/2020	713	7.54	7.7	5	0.03	0.9	F
30/10/2020	657	7.45	5.3	5	0.03	1.2	F
19/11/2020	561	6.97	19	5	0.05	0.4	F
14/12/2020	698	7.93	9.9	5	0.03	0.7	F
20/01/2021	594	7.1	6.5	5	0.08	0.4	F
23/02/2021	652	7.3	11	5	0.05	0.6	F
10/03/2021	753	7.4	6.6	5	0.03	0.8	F
9/04/2021	746	7.1	14	5	0.5	0.2	F
7/05/2021	169	6.9	18	7.9	0.18	1.02	F
2/06/2021	681	7.6	5.7	5	0.03	6.9	NF
1/07/2021	980	7.1	6.8	7.6	0.03	1.22	NF
2/08/2021	1050	6.8	5.5	8.7	0.02	0.2	F
1/09/2021	368	8.06	5.9	12	0.04	1.4	F
6/10/2021	503	7.2	2.2	6.7	0.01	0.2	NF
3/11/2021	599	8.7	21	5	0.03	1.7	NF
9/12/2021	596	7.1	5.6	5	0.08	2.7	NF
1/09/2021	379	7.5	11	5	0.03	2.37	NF
6/10/2021	475	8	2.7	13	0.01	0.2	F
3/11/2021	609	7.9	13	5	0.03	0.9	F
9/12/2021	506	7	10	5	0.02	2.2	NF
6/01/2022	758	7.2	14	12	0.03	2.9	NF
1/02/2022	326	7.1	7	5	0.11	0.3	NF
9/03/2022	NS	7	10	5	0.04	1.0	F
5/04/2022	441	7.3	6	6.4	0.03	3.7	NF
3/05/2022	418	7.7	11	5	0.03	0.9	NF
2/06/2022	384	8	8	5	0.02	0.9	F
6/07/2022	181	8.2	8	5	0.17	1.0	F
3/08/2022	311	8.6	7	6	0.03	1.2	F
7/09/2022	421	8.4	5	5	0.04	0.2	NF
5/10/2022	390	7.4	5	5	0.02	0.2	NF
9/11/2022	310	8.2	12	25	0.05	49.0	NF
6/12/2022	434	8.1	8	5	0.05	1.3	F
4/01/2023	789	8.15	5	6.5	0.01	1.1	NF
8/02/2023	286	7.6	24	6.8	0.03	2.3	NF
1/03/2023	553	8.1	250	8.8	0.01	0.9	NF
4/04/2023	5131	8.4	6.8	9	0.06	0.2	NF
2/05/2023	555	7.7	20	5.5	0.06	1.1	NF
1/06/2023	512	8.9	14	15	0.02	0.7	NF
4/07/2023	625	8.1	5	5	0.01	0.5	NF
1/08/2023	939	9.1	7.5	5	0.02	1.74	NF
9/06/2023	1598	6.9	5	5	0.01	5	NF
10/05/2023	1040	8.2	18	18	0.02	0.8	NF
8/11/2023	751	7.4	130	5	0.01	0.2	NF
8/12/2023	1000	8.2	6.8	15	0.03	0.6	NF
<b>Average</b>	<b>831.60</b>	<b>7.08</b>	<b>14.29</b>	<b>2.94</b>	<b>0.04</b>	<b>1.31</b>	<b>-</b>

Long Term Surface Water Results

Date	EC	pH	Suspended Solids	Total Oil and Grease	Total Phosphorous	Total Nitrogen	Flow Observations
	µs/cm		mg/L	mg/L	mg/L	mg/L	
<b>ANZECC Criteria</b>	<b>N/A</b>	<b>6.5 to 7.5</b>	<b>50</b>	<b>10</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
<b>Minimum</b>	<b>163.00</b>	<b>5.50</b>	<b>2.00</b>	<b>0.90</b>	<b>0.00</b>	<b>0.04</b>	<b>-</b>
<b>Maximum</b>	<b>3255.00</b>	<b>9.70</b>	<b>320.00</b>	<b>25.00</b>	<b>0.89</b>	<b>49.00</b>	<b>-</b>
<b>SW8</b>							
19/01/2018	NS	NS	NS	NS	NS	NS	Dry
14/02/2018	NS	NS	NS	NS	NS	NS	NF
15/03/2018	NS	NS	NS	NS	NS	NS	Dry
20/04/2018	NS	NS	NS	NS	NS	NS	Dry
18/05/2018	NS	NS	NS	NS	NS	NS	Dry
14/06/2018	NS	NS	NS	NS	NS	NS	Dry
16/07/2018	NS	NS	NS	NS	NS	NS	Dry
13/08/2018	NS	NS	NS	NS	NS	NS	Dry
17/09/2018	NS	NS	NS	NS	NS	NS	Dry
23/10/2018	NS	NS	NS	NS	NS	NS	Dry
15/11/2018	NS	NS	NS	NS	NS	NS	Dry
17/12/2018	NS	NS	NS	NS	NS	NS	Dry
21/01/2019	NS	NS	NS	NS	NS	NS	NF
20/02/2019	NS	NS	NS	NS	NS	NS	NF
18/03/2019	NS	NS	NS	NS	NS	NS	NF
29/04/2019	NS	NS	NS	NS	NS	NS	NF
30/05/2019	NS	NS	NS	NS	NS	NS	NF
14/06/2019	NS	NS	NS	NS	NS	NS	NF
11/07/2019	380	7.84	16	1	0.08	1.89	F
20/08/2019	NS	NS	NS	NS	NS	NS	NF
18/09/2019	NS	NS	NS	NS	NS	NS	NF
15/10/2019	NS	NS	NS	NS	NS	NS	NF
13/11/2019	NS	NS	NS	NS	NS	NS	NF
12/12/2019	NS	NS	NS	NS	NS	NS	NF
3/04/2020	293	7.86	630	14	0.05	2.9	NF
20/05/2020	208.9	7.47	540	5	0.51	3.3	NF
11/06/2020	296.6	8.7	270	5.4	0.55	4.6	NF
30/07/2020	202.5	7.84	330	5	0.38	2.7	NF
25/08/2020	215.4	8.34	830	7.3	0.39	4.6	NF
3/09/2020	308.2	8.11	170	5	0.08	5.6	NF
30/10/2020	384.1	7.7	79	5	0.08	5	NF
19/11/2020	477.1	8.3	22	5	0.05	5.2	NF
14/12/2020	477.6	7.85	32	5	0.03	5.6	NF
2/08/2021	NS	NS	NS	NS	NS	NS	Dry
1/09/2021	NS	NS	NS	NS	NS	NS	Dry
6/10/2021	NS	NS	NS	NS	NS	NS	Dry
3/11/2021	NS	NS	NS	NS	NS	NS	Dry
9/12/2021	NS	NS	NS	NS	NS	NS	Dry
6/01/2022	NS	NS	NS	NS	NS	NS	Dry
1/02/2022	NS	NS	NS	NS	NS	NS	Dry
9/03/2022	NS	NS	NS	NS	NS	NS	Dry
5/04/2022	NS	NS	NS	NS	NS	NS	Dry
3/05/2022	NS	NS	NS	NS	NS	NS	Dry
2/06/2022	NS	NS	NS	NS	NS	NS	Dry
6/07/2022	NS	NS	NS	NS	NS	NS	Dry
3/08/2022	NS	NS	NS	NS	NS	NS	Dry
7/09/2022	NS	NS	NS	NS	NS	NS	Dry
5/10/2022	NS	NS	NS	NS	NS	NS	Dry
9/11/2022	NS	NS	NS	NS	NS	NS	Dry
6/12/2022	NS	NS	NS	NS	NS	NS	Dry
4/01/2023	DRY	DRY	DRY	DRY	DRY	DRY	DRY
8/02/2023	DRY	DRY	DRY	DRY	DRY	DRY	DRY
1/03/2023	DRY	DRY	DRY	DRY	DRY	DRY	DRY
4/04/2023	DRY	DRY	DRY	DRY	DRY	DRY	DRY
2/05/2023	DRY	DRY	DRY	DRY	DRY	DRY	DRY
1/06/2023	DRY	DRY	DRY	DRY	DRY	DRY	DRY
4/07/2023	DRY	DRY	DRY	DRY	DRY	DRY	DRY

Long Term Surface Water Results

Date	EC	pH	Suspended Solids	Total Oil and Grease	Total Phosphorous	Total Nitrogen	Flow Observations
	µs/cm		mg/L	mg/L	mg/L	mg/L	
<b>ANZECC Criteria</b>	<b>N/A</b>	<b>6.5 to 7.5</b>	<b>50</b>	<b>10</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
1/08/2023	DRY	DRY	DRY	DRY	DRY	DRY	DRY
9/06/2023	DRY	DRY	DRY	DRY	DRY	DRY	DRY
10/05/2023	DRY	DRY	DRY	DRY	DRY	DRY	DRY
8/11/2023	DRY	DRY	DRY	DRY	DRY	DRY	DRY
8/12/2023	DRY	DRY	DRY	DRY	DRY	DRY	DRY
<b>Average</b>	<b>324.34</b>	<b>8.00</b>	<b>291.90</b>	<b>5.77</b>	<b>0.22</b>	<b>4.14</b>	-
<b>Minimum</b>	<b>202.50</b>	<b>7.47</b>	<b>16.00</b>	<b>1.00</b>	<b>0.03</b>	<b>1.89</b>	-
<b>Maximum</b>	<b>477.60</b>	<b>8.70</b>	<b>830.00</b>	<b>14.00</b>	<b>0.55</b>	<b>5.60</b>	-
<b>SW10</b>							
19/01/2018	NS	NS	NS	NS	NS	NS	Dry
14/02/2018	NS	NS	NS	NS	NS	NS	NF
15/03/2018	NS	NS	NS	NS	NS	NS	Dry
20/04/2018	NS	NS	NS	NS	NS	NS	Dry
18/05/2018	NS	NS	NS	NS	NS	NS	Dry
14/06/2018	NS	NS	NS	NS	NS	NS	Dry
16/07/2018	NS	NS	NS	NS	NS	NS	Dry
13/08/2018	NS	NS	NS	NS	NS	NS	Dry
17/09/2018	NS	NS	NS	NS	NS	NS	Dry
23/10/2018	NS	NS	NS	NS	NS	NS	Dry
15/11/2018	NS	NS	NS	NS	NS	NS	Dry
17/12/2018	NS	NS	NS	NS	NS	NS	Dry
21/01/2019	NS	NS	NS	NS	NS	NS	NF
20/02/2019	NS	NS	NS	NS	NS	NS	NF
18/03/2019	NS	NS	NS	NS	NS	NS	NF
29/04/2019	NS	NS	NS	NS	NS	NS	NF
30/05/2019	NS	NS	NS	NS	NS	NS	NF
14/06/2019	NS	NS	NS	NS	NS	NS	NF
11/07/2019	NS	NS	NS	NS	NS	NS	NF
20/08/2019	NS	NS	NS	NS	NS	NS	NF
18/09/2019	NS	NS	NS	NS	NS	NS	NF
15/10/2019	NS	NS	NS	NS	NS	NS	NF
13/11/2019	NS	NS	NS	NS	NS	NS	NF
12/12/2019	NS	NS	NS	NS	NS	NS	NF
3/04/2020	2840	6.77	5.3	10	0.05	1.6	NF
20/05/2020	2670	6.87	140	5	0.76	0.7	NF
11/06/2020	4087	7.8	100	5	0.8	0.6	NF
30/07/2020	2367	6.72	87	8.3	0.38	0.9	NF
25/08/2020	2749	7.24	17	5	0.11	0.7	F
3/09/2020	2871	6.63	42	5.2	0.07	0.7	NF
30/10/2020	2678	6.87	62	5	0.12	0.3	NF
19/11/2020	2936	6.82	750	5.6	0.07	4.56	NF
14/12/2020	3526	7.48	8.1	5	0.13	0.4	NF
20/01/2021	3924	6.83	97	5	0.24	0.6	NF
23/02/2021	4580	7.2	180	5	0.78	0.3	NF
10/03/2021	4830	7.2	93	5	0.54	0.2	NF
9/04/2021	3720	7	33	5	0.5	0.2	NF
7/05/2021	119	7	150	7.3	0.2	1.8	F
2/06/2021	2770	6.8	130	5	0.35	2.79	NF
1/07/2021	3260	7.01	75	6.1	0.33	2.7	F
2/08/2021	3130	6.8	39	5	0.16	0.4	NF
1/09/2021	1940	6.7	44	12	0.1	0.2	NF
6/10/2021	1940	7.1	19	8.4	0.07	0.2	NF
3/11/2021	2310	7	21	5	0.07	6.7	NF
9/12/2021	481	7.1	540	13	0.28	3.7	NF
6/01/2022	759	7	96	13	0.55	5.2	NF
1/02/2022	300	7	1800	5	0.01	1.4	NF
9/03/2022		7	120	13	0.01	1.9	F
5/04/2022	685	7	15	12	0.01	0.9	F
3/05/2022	459	7	50	11	0.17	0.4	NF
2/06/2022	398	8	14	26	0.08	1.0	F

Long Term Surface Water Results

Date	EC	pH	Suspended Solids	Total Oil and Grease	Total Phosphorous	Total Nitrogen	Flow Observations
	µs/cm		mg/L	mg/L	mg/L	mg/L	
<b>ANZECC Criteria</b>	<b>N/A</b>	<b>6.5 to 7.5</b>	<b>50</b>	<b>10</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
6/07/2022	142	8	35	5	0.52	2.0	F
3/08/2022	308	7	14	6.8	0.08	1.6	F
7/09/2022	434	8	9	5	0.12	0.2	NF
5/10/2022	476	7	76	5	0.21	1.7	NF
9/11/2022	378	7	38	18	0.19	0.8	NF
6/12/2022	592	7	18	5	0.05	0.4	NF
4/01/2023	344	7.3	98	13	0.07	2.49	NF
8/02/2023	512	7.34	19	5	0.01	1.6	NF
1/03/2023	957	7.9	24	5	0.01	1.4	NF
4/04/2023	6040	8.8	19	16	0.01	0.2	NF
2/05/2023	288	7.5	60	7.9	0.1	0.9	NV
1/06/2023	565	8.9	11	5	0.17	1	NF
4/07/2023	522	8.9	18	5	0.01	0.9	NF
1/08/2023	982	8.1	31	5	0.04	1.2	NF
9/06/2023	922	7.4	21	5.9	0.01	1.1	NF
10/05/2023	372	8.6	210	5	0.38	0.7	NF
8/11/2023	DRY	DRY	DRY	DRY	0.1	0.5	DRY
8/12/2023	DRY	DRY	DRY	DRY	0.09	0.1	DRY
<b>Average</b>	<b>2020.59</b>	<b>7.12</b>	<b>149.02</b>	<b>7.90</b>	<b>0.25</b>	<b>1.44</b>	-
<b>Minimum</b>	<b>308.00</b>	<b>6.63</b>	<b>5.30</b>	<b>5.00</b>	<b>0.01</b>	<b>0.20</b>	-
<b>Maximum</b>	<b>4830.00</b>	<b>7.80</b>	<b>1800.00</b>	<b>26.00</b>	<b>0.80</b>	<b>6.70</b>	-
<b>SW11</b>							
20/04/2017	3130	7.72	8	1	0.04	0.68	No Flow Pooling
25/05/2017	2750	7.64	3	1	0.02	0.5	Low
24/08/2017	3260	7.78	6	1	0.04	0.45	Minimal inflow, no outflow
19/01/2018	NS	NS	NS	NS	NS	NS	Dry
14/02/2018	NS	NS	NS	NS	NS	NS	NF
15/03/2018	NS	NS	NS	NS	NS	NS	Dry
20/04/2018	NS	NS	NS	NS	NS	NS	Dry
18/05/2018	NS	NS	NS	NS	NS	NS	Dry
14/06/2018	NS	NS	NS	NS	NS	NS	Dry
16/07/2018	NS	NS	NS	NS	NS	NS	Dry
13/08/2018	NS	NS	NS	NS	NS	NS	Dry
17/09/2018	NS	NS	NS	NS	NS	NS	Dry
23/10/2018	NS	NS	NS	NS	NS	NS	Dry
15/11/2018	NS	NS	NS	NS	NS	NS	Dry
17/12/2018	NS	NS	NS	NS	NS	NS	Dry
21/01/2019	NS	NS	NS	NS	NS	NS	NF
20/02/2019	NS	NS	NS	NS	NS	NS	NF
18/03/2019	NS	NS	NS	NS	NS	NS	NF
29/04/2019	NS	NS	NS	NS	NS	NS	NF
30/05/2019	NS	NS	NS	NS	NS	NS	NF
14/06/2019	NS	NS	NS	NS	NS	NS	NF
11/07/2019	NS	NS	NS	NS	NS	NS	NF
20/08/2019	NS	NS	NS	NS	NS	NS	NF
18/09/2019	NS	NS	NS	NS	NS	NS	NF
15/10/2019	NS	NS	NS	NS	NS	NS	NF
13/11/2019	NS	NS	NS	NS	NS	NS	NF
12/12/2019	NS	NS	NS	NS	NS	NS	NF
28/02/2020	1720	7.21	82	1	0.21	2.7	F
3/04/2020	2530	7.04	160	10	0.24	0.7	NF
20/05/2020	2206	6.62	900	5	2.5	2.4	NF
11/06/2020	3553	7.12	170	5	0.15	0.7	F
30/07/2020	1873	7.58	4.5	6.8	0.03	1.2	F
25/08/2020	1090	7.53	1.2	5	0.02	0.7	F
3/09/2020	2101	7.4	39	5	0.04	0.7	F
30/10/2020	2292	7.48	6.9	5	0.02	1.3	F
19/11/2020	1673	6.94	160	5	0.05	0.5	NF
14/12/2020	1914	7.32	1900	8.4	14	70	NF
20/01/2021	NS	NS	NS	NS	NS	NS	NF

Long Term Surface Water Results

Date	EC	pH	Suspended Solids	Total Oil and Grease	Total Phosphorous	Total Nitrogen	Flow Observations
	µs/cm		mg/L	mg/L	mg/L	mg/L	
<b>ANZECC Criteria</b>	<b>N/A</b>	<b>6.5 to 7.5</b>	<b>50</b>	<b>10</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
23/02/2021	3390	7.4	37	5	0.06	1.8	F
10/03/2021	6510	7	190	5	0.37	0.2	NF
9/04/2021	1880	7.5	41	5	0.5	0.2	F
7/05/2021	369	7.5	15	8.7	0.32	0.49	F
2/06/2021	2270	7.6	4.6	5	0.02	0.5	NF
1/07/2021	3930	7.7	2.8	5	0.02	0.6	NF
2/08/2021	4110	7.1	6.2	5	0.01	0.2	F
1/09/2021	1180	7.5	74	10	0.04	1.5	F
6/10/2021	2160	7.8	1.2	7.3	0.01	0.2	NF
3/11/2021	2530	7.5	21	5	0.16	0.9	NF
9/12/2021	1560	7.5	7.8	6.7	0.14	4.8	NF
6/01/2022	2150	7.3	30.0	5.0	0.07	3.2	NF
1/02/2022	806	7.1	5.0	5.0	0.34	2.2	NF
9/03/2022	NA	7.2	7.8	10.0	0.29	2.1	F
5/04/2022	1260	7.5	5.0	23.0	0.02	1.6	NF
3/05/2022	1240	7.6	5.0	5.0	0.02	0.9	NF
2/06/2022	1270	7.6	5.0	5.0	0.02	0.6	NF
6/07/2022	325	7.6	9.4	5.0	0.07	1.2	F
3/08/2022	951	7.9	5.0	15.0	0.03	1.1	NF
7/09/2022	991	8.3	5.0	5.0	0.03	0.2	NF
5/10/2022	1290	7.1	5.0	12.0	0.22	2.9	NF
9/11/2022	726	7.5	5.3	11.0	0.04	0.2	NF
6/12/2022	1160	7.5	5.0	9.2	0.02	0.6	NF
4/01/2023	344	7.3	98	13	0.02	1.2	NV
8/02/2023	512	7.34	19	5	0.01	2.3	V
1/03/2023	957	7.9	24	5	0.01	1	NV
4/04/2023	6040	8.8	19	16	0.01	0.2	NV
2/05/2023	288	7.5	60	7.9	0.02	0.9	NF
1/06/2023	565	8.9	11	5	0.35	0.7	NV
4/07/2023	522	8.9	18	5	0.11	0.8	NV
1/08/2023	982	8.1	31	5	0.01	2.1	NV
9/06/2023	922	7.4	21	5.9	0.01	1.4	NV
10/05/2023	372	8.6	210	5	0.03	0.2	NV
8/11/2023	DRY	DRY	DRY	DRY	0.01	0.6	DRY
8/12/2023	DRY	DRY	DRY	DRY	0.04	0.5	DRY
<b>Average</b>	<b>2061.43</b>	<b>7.44</b>	<b>109.27</b>	<b>6.59</b>	<b>0.56</b>	<b>3.08</b>	<b>-</b>
<b>Minimum</b>	<b>325.00</b>	<b>6.62</b>	<b>1.20</b>	<b>1.00</b>	<b>0.01</b>	<b>0.20</b>	<b>-</b>
<b>Maximum</b>	<b>6510.00</b>	<b>7.80</b>	<b>1900.00</b>	<b>23.00</b>	<b>14.00</b>	<b>70.00</b>	<b>-</b>

Groundwater Results

Location	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
<b>Depth to Water Level</b>					
MP1	m	1.2	1.2	1.3	1.4
MP2		15.7	14.8	14.8	15.0
MP4		17.6	19.3	17.8	18.2
MP5		18.8	19.4	19.5	19.8
MP7		17.7	18.3	18.6	18.7
MP10		4.2	4.5	4.8	5.0
MP11		10.5	10.3	10.9	10.7
GPZ1		10.8	11.9	10.8	10.8
GPZ5		9.2	8.4	8.8	8.7
GPZ6		4.4	5.0	5.0	5.8
GPZ8		6.8	6.6	6.6	6.8
<b>pH</b>					
MP1	pH Units	7.2	7.8	6.3	7.8
MP2		7.0	7.9	6.5	7.8
MP4		6.6	7.0	6.1	7.3
MP5		6.8	7.4	6.8	7.4
MP7		7.4	7.9	6.8	8.2
MP10		7.6	7.2	6.6	7.0
MP11		7.5	7.2	7.4	7.6
GPZ1		7.9	8.2	7.6	8.0
GPZ5		8.0	8.0	7.6	7.8
GPZ6		7.5	7.5	7.0	8.6
GPZ8		7.4	7.6	6.9	9.8
<b>EC</b>					
MP1	µS/cm	558	567	1230	949
MP2		140	161	3299	266
MP4		186	169	3783	300
MP5		314	354	824	659
MP7		2370	2640	5528	4370
MP10		386	3920	7578	6090
MP11		320	343	15	715
GPZ1		430	493	991	757
GPZ5		2020	2000	3800	3030
GPZ6		348	677	788	569
GPZ8		1110	1210	2668	2140
<b>Sulphate</b>					
MP1		30.0	20.0	310	23
MP2		8.0	2.0	240	2



Groundwater Results

Location	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
MP4	mg/L	2.0	2.0	110	2
MP5		2.0	2.0	6	2
MP7		15.0	36.0	49	43
MP10		17.0	21.0	35	27
MP11		32.0	2.0	2	2
GPZ1		13.0	8.9	50	10
GPZ5		3.8	3.4	1600	3
GPZ6		23.0	33.0	2	22
GPZ8		5.0	2.9	9	6
<b>Kjeldahl Nitrogen</b>					
MP1	mg/L	0.20	-	-	-
MP2		0.20	-	-	-
MP4		0.50	-	-	-
MP5		0.40	-	-	-
MP7		0.20	-	-	-
MP10		0.30	-	-	-
MP11		0.50	-	-	-
GPZ1		45.00	-	-	-
GPZ5		1.20	-	-	-
GPZ6		0.40	-	-	-
GPZ8		0.70	-	-	-
<b>Total Phosphate</b>					
MP1	mg/L	0.31	-	-	-
MP2		0.08	-	-	-
MP4		0.8	-	-	-
MP5		0.06	-	-	-
MP7		0.06	-	-	-
MP10		0.02	-	-	-
MP11		0.04	-	-	-
GPZ1		0.87	-	-	-
GPZ5		0.53	-	-	-
GPZ6		0.41	-	-	-
GPZ8		0.08	-	-	-
<b>TDS</b>					
MP1		357	363	800	607
MP2		91	105	214	173
MP4		121	110	246	195
MP5		204	230	535	423
MP7		1520	1690	3599	2800

Groundwater Results

Location	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
MP10	mg/L	2470	2510	4937	3830
MP11		208	223	9	458
GPZ1		280	320	645	484
GPZ5		1290	1280	2477	1940
GPZ6		226	433	511	364
GPZ8		710	777	1733	1370
<b>Hardness as CaCO3</b>					
MP1	mg/L	260	230	220	250
MP2		44	44	45	52
MP4		69	62	63	68
MP5		190	190	190	190
MP7		1500	1300	1500	1600
MP10		1900	1700	1700	1800
MP11		280	290	280	280
GPZ1		320	300	280	290
GPZ5		130	130	120	120
GPZ6		100	340	86	80
GPZ8		860	810	780	830
<b>Sodium-Filtered</b>					
MP1	mg/L	130	120	120	140
MP2		39	33	35	43
MP4		46	40	40	45
MP5		58	58	58	59
MP7		370	350	390	420
MP10		660	690	680	720
MP11		34	34	32	35
GPZ1		75	79	76	80
GPZ5		700	760	760	780
GPZ6		120	170	110	110
GPZ8		130	140	140	150
<b>Pottasium - Filtered</b>					
MP1	mg/L	c	3.6	3.1	4.3
MP2		5.2	3.4	3.3	3.9
MP4		2.0	2.0	1.8	3.7
MP5		4.6	5.2	4.4	5.0
MP7		5.3	5.7	4.8	5.6
MP10		10.0	11.0	9.4	11.0
MP11		2.2	2.6	2.1	2.3

## Groundwater Results

Location	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
GPZ1		5.3	5.6	4.7	5.5
GPZ5		9.3	10.0	8.6	9.7
GPZ6		1.9	4.6	1.7	1.3
GPZ8		13.0	13.0	10.0	10.0
<b>Sulphate</b>					
MP1	mg/L	30.0	20.0	310	23
MP2		8.0	2.0	240	2
MP4		2.0	2.0	110	2
MP5		2.0	2.0	6	2
MP7		15.0	36.0	49	43
MP10		17.0	21.0	35	27
MP11		32.0	2.0	2	2
GPZ1		13.0	8.9	50	10
GPZ5		3.8	3.4	1600	3
GPZ6		23.0	33.0	2	22
GPZ8		5.0	2.9	9	6
<b>Chloride</b>					
MP1	mg/L	240	190	230	200
MP2		86	54	63	65
MP4		66	46	50	51
MP5		110	120	110	100
MP7		390	1300	1600	1500
MP10		1500	2000	2300	2200
MP11		190	26	24	23
GPZ1		84	86	120	80
GPZ5		150	850	470	670
GPZ6		92	250	71	50
GPZ8		370	550	560	530
<b>Silver - Filtered</b>					
MP1	ug/L	0.005	-	-	-
MP2		0.005	-	-	-
MP4		0.005	-	-	-
MP5		0.005	-	-	-
MP7		0.005	-	-	-
MP10		0.005	-	-	-
MP11		0.005	-	-	-
GPZ1		0.005	-	-	-
GPZ5		0.005	-	-	-
GPZ6		0.005	-	-	-

Groundwater Results

Location	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
GPZ8		0.005	-	-	-
<b>Aluminium</b>					
MP1	ug/L	0.05	-	-	-
MP2		0.05	-	-	-
MP4		0.05	-	-	-
MP5		0.06	-	-	-
MP7		0.05	-	-	-
MP10		0.50	-	-	-
MP11		0.05	-	-	-
GPZ1		0.05	-	-	-
GPZ5		0.05	-	-	-
GPZ6		0.05	-	-	-
GPZ8		0.05	-	-	-
<b>Antimony</b>					
MP1	ug/L	0.005	-	-	-
MP2		0.005	-	-	-
MP4		0.005	-	-	-
MP5		0.005	-	-	-
MP7		0.005	-	-	-
MP10		0.005	-	-	-
MP11		0.005	-	-	-
GPZ1		0.005	-	-	-
GPZ5		0.005	-	-	-
GPZ6		0.005	-	-	-
GPZ8		0.005	-	-	-
<b>Barium</b>					
MP1	ug/L	0.21	-	-	-
MP2		0.04	-	-	-
MP4		0.06	-	-	-
MP5		0.15	-	-	-
MP7		0.30	-	-	-
MP10		0.37	-	-	-
MP11		0.53	-	-	-
GPZ1		0.11	-	-	-
GPZ5		0.31	-	-	-
GPZ6		0.17	-	-	-
GPZ8		2.00	-	-	-
<b>Beryllium</b>					
MP1		0.001	-	-	-

Groundwater Results

Location	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
MP2	ug/L	0.001	-	-	-
MP4		0.001	-	-	-
MP5		0.001	-	-	-
MP7		0.001	-	-	-
MP10		0.001	-	-	-
MP11		0.001	-	-	-
GPZ1		0.001	-	-	-
GPZ5		0.001	-	-	-
GPZ6		0.001	-	-	-
GPZ8		0.001	-	-	-
<b>Boron</b>					
MP1	ug/L	0.05	-	-	-
MP2		0.05	-	-	-
MP4		0.05	-	-	-
MP5		0.05	-	-	-
MP7		0.05	-	-	-
MP10		0.05	-	-	-
MP11		0.05	-	-	-
GPZ1		0.05	-	-	-
GPZ5		0.05	-	-	-
GPZ6		0.05	-	-	-
GPZ8	0.05	-	-	-	
<b>Cadmium</b>					
MP1	mg/L	0.0002	-	-	-
MP2		0.0002	-	-	-
MP4		0.0002	-	-	-
MP5		0.0002	-	-	-
MP7		0.0002	-	-	-
MP10		0.0002	-	-	-
MP11		0.0002	-	-	-
GPZ1		0.0002	-	-	-
GPZ5		0.0002	-	-	-
GPZ6		0.0002	-	-	-
GPZ8	0.0002	-	-	-	
<b>Chromium</b>					
MP1		0.0010	-	-	-
MP2		0.0010	-	-	-
MP4		0.0010	-	-	-
MP5		0.0010	-	-	-

## Groundwater Results

Location	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
MP7	mg/L	0.0010	-	-	-
MP10		0.0010	-	-	-
MP11		0.0010	-	-	-
GPZ1		0.0010	-	-	-
GPZ5		0.0010	-	-	-
GPZ6		0.0010	-	-	-
GPZ8		0.0010	-	-	-
<b>Cobalt</b>					
MP1	ug/L	0.001	-	-	-
MP2		0.002	-	-	-
MP4		0.002	-	-	-
MP5		0.003	-	-	-
MP7		0.001	-	-	-
MP10		0.001	-	-	-
MP11		0.001	-	-	-
GPZ1		0.001	-	-	-
GPZ5		0.001	-	-	-
GPZ6		0.001	-	-	-
GPZ8		0.002	-	-	-
<b>Manganese</b>					
MP1	ug/L	0.570	-	-	-
MP2		0.680	-	-	-
MP4		0.580	-	-	-
MP5		0.920	-	-	-
MP7		1.400	-	-	-
MP10		0.067	-	-	-
MP11		0.005	-	-	-
GPZ1		0.005	-	-	-
GPZ5		0.450	-	-	-
GPZ6		0.005	-	-	-
GPZ8		4.500	-	-	-
<b>Molybdenum</b>					
MP1	ug/L	0.005	-	-	-
MP2		0.005	-	-	-
MP4		0.005	-	-	-
MP5		0.008	-	-	-
MP7		0.005	-	-	-
MP10		0.005	-	-	-
MP11		0.005	-	-	-

Groundwater Results

Location	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
GPZ1		0.019	-	-	-
GPZ5		0.410	-	-	-
GPZ6		0.012	-	-	-
GPZ8		0.005	-	-	-
<b>Nickel</b>					
MP1	ug/L	0.001	-	-	-
MP2		0.004	-	-	-
MP4		0.009	-	-	-
MP5		0.002	-	-	-
MP7		0.001	-	-	-
MP10		0.003	-	-	-
MP11		0.001	-	-	-
GPZ1		0.001	-	-	-
GPZ5		0.001	-	-	-
GPZ6		0.001	-	-	-
GPZ8		0.005	-	-	-
<b>Lead</b>					
MP1	ug/L	0.001	-	-	-
MP2		0.001	-	-	-
MP4		0.001	-	-	-
MP5		0.001	-	-	-
MP7		0.001	-	-	-
MP10		0.001	-	-	-
MP11		0.001	-	-	-
GPZ1		0.001	-	-	-
GPZ5		0.001	-	-	-
GPZ6		0.001	-	-	-
GPZ8		0.001	-	-	-
<b>Selenium</b>					
MP1	ug/L	0.001	-	-	-
MP2		0.001	-	-	-
MP4		0.001	-	-	-
MP5		0.001	-	-	-
MP7		0.001	-	-	-
MP10		0.001	-	-	-
MP11		0.001	-	-	-
GPZ1		0.001	-	-	-
GPZ5		0.001	-	-	-
GPZ6		0.001	-	-	-

Groundwater Results

Location	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
GPZ8		0.001	-	-	-
<b>Zinc</b>					
MP1	ug/L	0.005	-	-	-
MP2		0.005	-	-	-
MP4		0.013	-	-	-
MP5		0.011	-	-	-
MP7		0.005	-	-	-
MP10		0.099	-	-	-
MP11		0.007	-	-	-
GPZ1		0.005	-	-	-
GPZ5		0.005	-	-	-
GPZ6		0.005	-	-	-
GPZ8		0.005	-	-	-
<b>Mercury</b>					
MP1	ug/L	0.0001	-	-	-
MP2		0.0001	-	-	-
MP4		0.0001	-	-	-
MP5		0.0001	-	-	-
MP7		0.0001	-	-	-
MP10		0.0001	-	-	-
MP11		0.0001	-	-	-
GPZ1		0.0001	-	-	-
GPZ5		0.0001	-	-	-
GPZ6		0.0001	-	-	-
GPZ8		0.0001	-	-	-
<b>WAD Cyanide</b>					
MP1	ug/L	0.005		-	-
MP2		0.005		-	-
MP4		0.005		-	-
MP5		0.005		-	-
MP7		0.005		-	-
MP10		0.005		-	-
MP11		0.005		-	-
GPZ1		0.005		-	-
GPZ5		0.005		-	-
GPZ6		0.005		-	-
GPZ8		0.005		-	-
<b>Calcium</b>					
MP1		39			-



Groundwater Results

Location	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
MP2	mg/L	7			-
MP4		12			-
MP5		57			-
MP7		340			-
MP10		310			-
MP11		95			-
GPZ1		65			-
GPZ5		19			-
GPZ6		15			-
GPZ8		160			-
<b>Magnesium</b>					
MP1	mg/L	39.0			-
MP2		7.3			-
MP4		9.1			-
MP5		10.0			-
MP7		140.0			-
MP10		230.0			-
MP11		6.8			-
GPZ1		31.0			-
GPZ5		18.0			-
GPZ6		14.0			-
GPZ8	96.0			-	
<b>Ammonia as N</b>					
MP1	mg/L	0.01	-	-	-
MP2		0.38	-	-	-
MP4		0.18	-	-	-
MP5		0.18	-	-	-
MP7		0.12	-	-	-
MP10		0.01	-	-	-
MP11		0.01	-	-	-
GPZ1		0.01	-	-	-
GPZ5		0.4	-	-	-
GPZ6		0.01	-	-	-
GPZ8	0.61	-	-	-	
<b>Nitrate as N</b>					
MP1		0.02	-	-	-
MP2		0.02	-	-	-
MP4		0.02	-	-	-
MP5		0.02	-	-	-

Groundwater Results

Location	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
MP7	mg/L	0.02	-	-	-
MP10		0.08	-	-	-
MP11		4.5	-	-	-
GPZ1		0.04	-	-	-
GPZ5		8.3	-	-	-
GPZ6		2	-	-	-
GPZ8		0.02	-	-	-
<b>Phosphorus as P</b>					
MP1	mg/L	0.05	-	-	-
MP2		0.05	-	-	-
MP4		0.05	-	-	-
MP5		0.05	-	-	-
MP7		0.05	-	-	-
MP10		0.05	-	-	-
MP11		0.05	-	-	-
GPZ1		0.76	-	-	-
GPZ5		0.15	-	-	-
GPZ6		0.41	-	-	-
GPZ8		0.05	-	-	-

2023 Blast Monitoring Data

Granite Pit						
Date	B4		B5		B6 Rail	B6 Pipeline
	Over Pressure	Ground Vibration	Over Pressure	Ground Vibration	Ground Vibration	Ground Vibration
13 Jan 2023	DNT	DNT	DNT	DNT	0.89mm/s	0.89mm/s
17 Jan 2023	DNT	DNT	DNT	DNT	DNT	DNT
19 Jan 2023	DNT	DNT	DNT	DNT	DNT	DNT
2 Feb 2023	DNT	DNT	DNT	DNT	DNT	DNT
7 Feb 2023	DNT	DNT	DNT	DNT	DNT	DNT
9 Feb 2023	DNT	DNT	DNT	DNT	0.56mm/s	0.56mm/s
14 Feb 2023	DNT	DNT	DNT	DNT	DNT	DNT
16 Feb 2023	DNT	DNT	DNT	DNT	DNT	DNT
21 Feb 2023	DNT	DNT	DNT	DNT	DNT	DNT
23 Feb 2023	DNT	DNT	DNT	DNT	DNT	DNT
28 Feb 2023	DNT	DNT	DNT	DNT	DNT	DNT
2 Mar 2023	DNT	DNT	DNT	DNT	DNT	DNT
3 Mar 2023	DNT	DNT	DNT	DNT	0.85mm/s	0.85mm/s
7 Mar 2023	DNT	DNT	DNT	DNT	DNT	DNT
9 Mar 2023	DNT	DNT	87.0db	0.57mm/s	1.02mm/s	1.02mm/s
14 Mar 2023	DNT	DNT	DNT	DNT	DNT	DNT
16 Mar 2023	DNT	DNT	DNT	DNT	DNT	DNT
21 Mar 2023	DNT	DNT	DNT	DNT	DNT	DNT
23 Mar 2023	DNT	DNT	DNT	DNT	0.67mm/s	0.67mm/s
28 Mar 2023	DNT	DNT	DNT	DNT	DNT	DNT
30 Mar 2023	DNT	DNT	DNT	DNT	0.72mm/s	0.72mm/s
4 Apr 2023	DNT	DNT	DNT	DNT	DNT	DNT
13 Apr 2023	DNT	DNT	DNT	DNT	DNT	DNT
20 Apr 2023	DNT	DNT	DNT	DNT	DNT	DNT
27 Apr 2023	DNT	DNT	DNT	DNT	DNT	DNT
28 Apr 2023	DNT	DNT	DNT	DNT	DNT	DNT
2 May 2023	DNT	DNT	DNT	DNT	DNT	DNT
4 May 2023	DNT	DNT	DNT	DNT	DNT	DNT
11 May 2023	DNT	DNT	DNT	DNT	DNT	DNT
16 May 2023	DNT	DNT	DNT	DNT	DNT	DNT
18 May 2023	DNT	DNT	DNT	DNT	DNT	DNT
23 May 2023	DNT	DNT	DNT	DNT	DNT	DNT
30 May 2023	DNT	DNT	DNT	DNT	DNT	DNT
1 Jun 2023	DNT	DNT	DNT	DNT	DNT	DNT
6 Jun 2023	DNT	DNT	DNT	DNT	DNT	DNT
13 Jun 2023	105.6 db	0.96 mm/s	DNT	DNT	DNT	DNT
15 Jun 2023	DNT	DNT	DNT	DNT	DNT	DNT
21 Jun 2023	DNT	DNT	DNT	DNT	DNT	DNT
27 Jun 2023	DNT	DNT	DNT	DNT	DNT	DNT
29 Jun 2023	DNT	DNT	DNT	DNT	DNT	DNT
4 Jul 2023	DNT	DNT	DNT	DNT	DNT	DNT
6 Jul 2023	DNT	DNT	DNT	DNT	0.65 mm/s	0.65 mm/s
18 Jul 2023	DNT	DNT	DNT	DNT	DNT	DNT
20 Jul 2023	DNT	DNT	DNT	DNT	0.63mm/s	0.63mm/s
25 Jul 2023	DNT	DNT	83.2 dbl	0.53 mm/s	0.49 mm/s	0.49 mm/s
27 Jul 2023	DNT	DNT	DNT	DNT	DNT	DNT
1 Aug 2023	DNT	DNT	DNT	DNT	DNT	DNT
8 Aug 2023	DNT	DNT	DNT	DNT	DNT	DNT
10 Aug 2023	DNT	DNT	DNT	DNT	DNT	DNT
15 Aug 2023	DNT	DNT	DNT	DNT	0.71mm/s	0.71mm/s
22 Aug 2023	DNT	DNT	DNT	DNT	DNT	DNT
24 Aug 2023	DNT	DNT	DNT	DNT	0.64 mm/s	0.64 mm/s
31 Aug 2023	DNT	DNT	DNT	DNT	DNT	DNT
5 Sep 2023	DNT	DNT	DNT	DNT	DNT	DNT
7 Sep 2023	DNT	DNT	DNT	DNT	DNT	DNT
12 Sep 2023	DNT	DNT	83.2 dbl	0.55 mm/s	1.25mm/s	1.25 mm/s
19 Sep 2023	DNT	DNT	DNT	DNT	DNT	DNT
21 Sep 2023	DNT	DNT	DNT	DNT	0.71 mm/s	0.71 mm/s
26 Sep 2023	DNT	DNT	DNT	DNT	DNT	DNT
28 Sep 2023	DNT	DNT	DNT	DNT	0.66 mm/s	0.56 mm/s
12 Oct 2023	DNT	DNT	DNT	DNT	DNT	DNT
17 Oct 2023	DNT	DNT	DNT	DNT	DNT	DNT
24 Oct 2023	DNT	DNT	104.0 db	0.53mm/s	DNT	DNT
2 Nov 2023	DNT	DNT	DNT	DNT	DNT	DNT
7 Nov 2023	DNT	DNT	DNT	DNT	1.20 mm/s	1.20 mm/s
9 Nov 2023	DNT	DNT	DNT	DNT	DNT	DNT
16 Nov 2023	DNT	DNT	DNT	DNT	0.75mm/s	0.75mm/s
21 Nov 2023	DNT	DNT	89.2 dbl	0.52 mm/s	1.17mm/s	1.17mm/s
30 Nov 2023	DNT	DNT	91.1 db	0.71 mm/s	0.53mm/s	0.53mm/s
1 Dec 2023	DNT	DNT	89.2 db	0.87 mm/s	1.09mm/s	1.09mm/s

2023 Blast Monitoring Data

5 Dec 2023	DNT	DNT	100.1db	0.70 mm/s	0.12 mm/s	0.12mm/s
12 Dec 2023	DNT	DNT	91.1db	0.57mm/s	0.51mm/s	0.51mm/s
14 Dec 2023	DNT	DNT	DNT	DNT	0.82 mm/s	0.82mm/s

Ignimbrite Pit						
Date	B1 Rail		B2 Pipeline		B3 Resident	
	Over Pressure	Ground Vibration	Over Pressure	Ground Vibration	Over Pressure	Ground Vibration
31 Jan 2023	DNT	DNT	DNT	DNT	DNT	DNT
18 Apr 2023	DNT	DNT	DNT	DNT	DNT	DNT

**APPENDIX 3**  
**IEA Action Plan**



Table 5-2: Non-compliance summary

Unique ID	Schedule	Parameter	Condition Number	Condition	Comments	Compliance	Non-Compliance ID	Recommendation
DA18	SCHEDULE 2 GENERAL ADMINISTRATIVE CONDITIONS	Production data	13 (a)	(a) provide annual quarry production data to DRG using the standard form for that purpose; and	The only evidence of reporting production data provided to the auditor is via the Annual Report to DPIE as per Condition 13(a) below.	Non-compliant	NC1	<b>Recommendation 1:</b> Provide annual production data to DRG using the standard form for that purpose.
DA62	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	AIR QUALITY (Incorporates OEH GTA) - Impact Assessment Criteria	12	Particulate matter < 10 µm (PM10) Averaging period: 24 hour Criterion 50 ug/m3	The 2018 and 2019 AERs both report that equipment failure resulted in samples not being collected as required due to power supply issues.  Equipment has since been upgraded to provide for a more stable power supply. Equipment performance should continue to be monitored to ensure compliance with the averaging periods. While non-compliant, <b>no further actions are recommended following the upgrade.</b>	Non-compliant	NC2	No further Recommendation.
DA196	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	REHABILITATION AND LANDSCAPING - Rehabilitation Bond	48	Within 3 months of each Independent Environmental Audit (see Condition 11 in Schedule 5) after the lodgement of the rehabilitation bond, the Applicant must review, and if necessary revise the sum of the bond to the satisfaction of the	The auditor has not been provided any evidence of a bond review occurring following the previous audit.	Non-compliant	NC3	<b>Recommendation 9:</b> Review and if necessary revise the bond to the satisfaction of the Secretary.



Unique ID	Schedule	Parameter	Condition Number	Condition	Comments	Compliance	Non-Compliance ID	Recommendation
				Secretary. This review must consider:				
DA197	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	REHABILITATION AND LANDSCAPING - Rehabilitation Bond	48 (a)	(a) the effects of inflation;	The auditor has not been provided any evidence of a bond review occurring following the previous audit.	Non-compliant	NC4	<b>Recommendation 9:</b> Review and if necessary revise the bond to the satisfaction of the Secretary.
DA198	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	REHABILITATION AND LANDSCAPING - Rehabilitation Bond	48 (b)	(b) any changes to the total area of disturbance; and	The auditor has not been provided any evidence of a bond review occurring following the previous audit.	Non-compliant	NC5	<b>Recommendation 9:</b> Review and if necessary, revise the bond to the satisfaction of the Secretary.
DA199	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	REHABILITATION AND LANDSCAPING - Rehabilitation Bond	48 (c)	(c) the performance of the rehabilitation against the completion criteria of the Rehabilitation and Landscape Management Plan.	The auditor has not been provided any evidence of a bond review occurring following the previous audit.	Non-compliant	NC6	<b>Recommendation 9:</b> Review and if necessary revise the bond to the satisfaction of the Secretary.
DA204	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	REHABILITATION AND LANDSCAPING - Retirement of Biodiversity Credits	48A (c)	Credit type: Ecosystem credits: HN614 Yellow Box – Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion Credits to be retired: 2124	The 2019 AER states: " <i>DPIE noted that Holcim was granted an extension to the retirement of biodiversity credits and that the credits were to be retired in June 2018, no biodiversity credits have been retired in 2019. Obligations around biodiversity credits will continue to be addressed in the 2020 annual review period.</i> "  No evidence has been seen of how this	Non-compliant	NC7	<b>Recommendation 10:</b> Consult with DPIE for how to close out the issue of non-retirement of credits.



Unique ID	Schedule	Parameter	Condition Number	Condition	Comments	Compliance	Non-Compliance ID	Recommendation
					may have been addressed throughout the 2020 annual review period.			
DA206	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	REHABILITATION AND LANDSCAPING - Retirement of Biodiversity Credits	48A (c)	Credit type: Ecosystem credits: HN515 Broad-leaved Peppermint – Ribbon Gum grassy open forest in the north-east of the South Eastern Highlands Bioregion Credits to be Retired 33	The 2019 AER states: "DPIE noted that Holcim was granted an extension to the retirement of biodiversity credits and that the credits were to be retired in June 2018, no biodiversity credits have been retired in 2019. Obligations around biodiversity credits will continue to be addressed in the 2020 annual review period".  No evidence has been seen of how this may have been addressed throughout the 2020 annual review period.	Non-compliant	NC8	<b>Recommendation 10:</b> Consult with DPIE for how to close out the issue of non-retirement of credits.
DA207	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	REHABILITATION AND LANDSCAPING - Retirement of Biodiversity Credits	48A (c)	Credit type: Ecosystem credits: Total: 3038 (2124 + 881 + 33)	The 2019 AER states: "DPIE noted that Holcim was granted an extension to the retirement of biodiversity credits and that the credits were to be retired in June 2018, no biodiversity credits have been retired in 2019. Obligations around biodiversity credits will continue to be addressed in the 2020 annual review period".  No evidence has been seen of how this may have been addressed throughout the 2020 annual review period.	Non-compliant	NC9	<b>Recommendation 10:</b> Consult with DPIE for how to close out the issue of non-retirement of credits.





Unique ID	Schedule	Parameter	Condition Number	Condition	Comments	Compliance	Non-Compliance ID	Recommendation
DA288	SCHEDULE 5 ENVIRONMENTAL	REPORTING - Annual Review	10	The Applicant must ensure that copies of the Annual Review are submitted to Council and are available to the Community Consultative Committee (see condition 7 of Schedule 5) and any interested person upon request.	While the AERs are publicly available on the Holcim website, there is no evidence that the AERs in the reporting period were submitted directly to Council.	Non-compliant	NC10	<b>Recommendation 19:</b> A list of agencies that receive the AERs is included in the AERs.
DA327	Appendix 7	APPENDIX 7: DETAILED HERITAGE CONDITIONS	9(e)	The progress on the archaeological works on site is systematically video recorded,	Videos are not able to be located and it is assumed that photographs were taken instead.	Non-compliant	NC11	<b>Recommendation 20:</b> Close this issue out with DPIE to avoid ongoing non-compliance issues at each audit. Ensure videos are taken during any future archaeological works on site.
SOC25	APPENDIX 11	APPENDIX 11: STATEMENT OF COMMITMENTS (Final May 2016) - Modification Project Management and Mitigation Measures - Surface Water	N/A (SOC)	Holcim Australia will update the Lynwood Quarry Water Management Plan. This will include an update to the Lockyersleigh Creek Riparian Area Management Plan.	The Water Management Plan is currently awaiting approval and contains management measures regarding Lockyersleigh Creek, however the Lockyersleigh Creek Riparian Area Management Plan has not been updated since 2011 to reflect any updates to the WMP or otherwise.	Non-Compliant	NC12	<b>Recommendation 21:</b> Review and update the Lockyersleigh Creek Riparian Area Management Plan.



Unique ID	Schedule	Parameter	Condition Number	Condition	Comments	Compliance	Non-Compliance ID	Recommendation
EPL34	N/A (EPL)	which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.	M4.2	The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant	The 'summarised event report listing' provided to the auditor as evidence does not include: <i>e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.</i>	<b>Non-Compliant</b>	<b>NC13</b>	<b>Recommendation 29:</b> For each incident recorded, include the actions taken, or if no action taken state why not.

# APPENDIX 4

## Approved CIF-Funded Projects since CIF Inception

Project Name	Total Approved
Bungonia: Sustaining the present through the past	\$8,000
Marulan Community Hall Upgrade	\$2,500
Marulan School Projects Room	\$15,000
Restoration of historical culvert	\$12,010
Computer hardware for archiving and cataloguing	\$2,500
Meridian mosaic installation	\$2,000
Tallong Memorial Hall Refurbishment	\$13,318
Marulan Road Safety	\$1,770
Towrang Hall Floor Refurbishment	\$14,230
Extension to GMC Road Safety Day	\$2,000
Insectivorous Bat Flight Centre	\$15,912
Increase in funds for GMC project - Road Safety	\$2,000
Thermal Imaging Camera	\$1,890
Tallong Community Memorial Walk	\$8,323
Tallong Hall project	\$5,133
Toilet Block for RFS	\$15,790
Community Sign at Towrang	\$11,923
Local Schools Co creating a sustainable future	\$4,000
Bungonia Community Engagement Program	\$4,500
Marulan Highway Signage	\$8,190
Promotions for Australia Day Committee	\$2,613
Muulii Murra (beautiful place)	\$2,800
MHS Archive & Research Facility	\$15,862
Marulan Public School Playground Upgrade	\$ 15,000 (funded in 2019, in progress as of October 2020)
Tallong Public School Playground Upgrade	\$ 15,000 (funded in 2019)
Marulan RFS - Training Room Extension	\$ 10,000 (funded in 2019)
Big Hill RFS - Thermal Imaging Camera	\$ 2,403 (funded in 2019)

Project Name	Total Approved
Tallong Community Focus Group – Defibrillator	\$ 2,572 (funded in 2019)
Marulan Kite Festival	\$3,000 (funded in 2020, however the event was cancelled)
Marulan Pony Club	\$1,500 (funded in 2020)
Goulburn & District Show Jumping Club	\$500 (funded in 2020)
Tallong Apple Festival	\$2,000 (funded in 2020)
Marulan Christmas Carols	\$3,500 (funded in 2020)
Goulburn Hockey Club	\$3,000 (funded in 2020)
Goulburn Cricket	\$3,000 (funded in 2020)
Marulan Soccer Club	\$5,000 (funded in 2020)
Goulburn Rugby	\$3,000 (funded in 2020)
Mayoral Charity Golf Day	\$5,000 (funded in 2020)
Goulburn Australia Day BBQ	\$1,000 (funded in 2020)
Tallong Public School Father's Day	\$600 (funded in 2020)
Lion's Club BBQ	\$500 (funded in 2020)
Marulan Australia Day BBQ	\$1,500 (funded in 2020)
Goulburn Mulwaree Council Australia Day BBQ	\$500 (funded in 2021)
Gunning Campdraft	\$500 (funded in 2021)
Towrang Valley Progress Assoc Australia Day BBQ	\$500 (funded in 2021)
Goulburn Agriculture, Pastoral and Horticultural Society	\$2,000 (funded in 2021)
Marulan Football Club	\$3,500 (funded in 2021)
Goulburn & District Showjumping Competition	\$1,000 (funded in 2021)
Tallong Apple Day Festival	\$900 (funded in 2022)
Marulan Football Club	\$500 (funded in 2022)
Tallong Public School P&C	\$900 (funded in 2022)
Cystic Fibrosis Goulburn	\$2000 (funded in 2022)
Goulburn and District Show jumping Competition	\$1000 (funded in 2022)
Convoy for Kids	\$500 (funded in 2022)
Goulburn Mayoral Charity Golf Day	\$5000 (funded in 2022)
Tallong Apple Day Festival	\$900 (funded in 2023)
Marulan Football Club	\$500 (funded in 2023)
Tallong Public School P&C	\$1,800 (funded in 2023)
Cystic Fibrosis Goulburn	\$2000 (funded in 2023)
Goulburn Rotary Charity Golf Day	\$5000 (funded in 2023)
TREK4KIDS Starlight foundation	\$3000 (funded in 2023)

Project Name	Total Approved