Holcim

Strength. Performance. Passion

Lynwood Quarry

2020 Annual Review

1 January 2020 – 31 December 2020

Table of Contents

Figures

Tables

Appendices

Title Block

Name of operation	Lynwood Quarry
Name of operator	Holcim (Australia) Pty Ltd
Development consent #	DA 128-5-2005
Annual review start date	1 January 2020
Annual review end date	31 December 2020
I, Declan Close, certify that this audit report is a true and accurate record of the compliance status of Lynwood Quarry for the period 1 January to 31 December 2020 and that I am authorised to make this statement on behalf of Holcim. *Note.* a) *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.* b) *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).*	
Name of authorized reporting officer	Declan Close
Title of authorized reporting officer	Lynwood Quarry Works Manager
Signature of authorised reporting officer	
Date	31/03/2021

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 2020 to 31 December 2020 (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
Water Access Licence (WAL) No. 25575	Yes
Controlled Activity Approval (CAA) No. 10 ERM 2011/0446	Yes
Aboriginal Heritage Impact Permit (AHIP) No. 1100264	Yes
S65 Approval under the *Heritage Act 1977* 2009/S65A/13	Yes

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: • Potential for serious environmental consequences, but is unlikely to occur; or • Potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: • Potential for moderate environmental consequences, but is unlikely to occur; or • Potential for low environmental consequences, but is likely to occur
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: Non-Compliances 2020

Relevant approval	Condition	NC 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)	Failure to monitor in accordance with Air Quality Monitoring Program. Failure to Monitor at High Volume Air Sampler (HVAS) units HVAS 1 (EPL point 14) and HVAS 2 (EPL point 15).	Non-compliant	Sampling events missed at HVAS 1 on 03/01/2020, 09/01/2020, and 15/01/2020. Sampling events missed at HVAS 2 on 03/01/2020 and 09/01/2020. Sampling event was missed at HVAS 1 due to machine being impacted by dust/wind storm on 27/1/2020. Software error impacted sample date and sample time. HVAS 1 reading of 75.7 µg/m^3. HVAS 2 reading of 95.7 µg/m^3. This occurred on 03/2/2020. See Section 11 for actions. Holcim informed DPIE of this incident.	**Section 6.3 and 11**
DA128-5-2005 (Mod 5)	Condition 12 of Schedule 3 (Impact Air Assessment)	Exceedance of short-term criteria at HVAS 2.	Non-compliant	PM_{10} result of 71 µg/m^3 at HVAS 2 on 23/01/2020 from a dust storm event was a major contributor of this result, as evidenced by meteorological data in the local area. Holcim informed DPIE of this incident.	**Section 6.3 and 11**
DA128-5-2005 (Mod 5)	Condition 12 of Schedule 3 (Impact Air Assessment) Condition M2.2 (EPL Air Quality Monitoring Requirements)	Condition M2.2 (EPL Air Quality Monitoring Requirements)	Non-compliant	Collection of depositional dust samples was not taken within the timeframe. See Section 11 for actions.	**Section 6.3 and 11**

Relevant approval	Condition	NC Summary	Compliance status	Comment from Holcim	Where addressed in this Report
DA128-5-2005 (Mod 5)	Condition 20 of Schedule 3 (Water Management Plan) Condition 23 of Schedule 3 (Water Management Plan)	Missed surface water monitoring	Non-compliant	Sampling events for February 2020 missed due to miscommunications around short month of February and changes in environmental monitoring contractors. Holcim informed DPIE of this incident.	**Section 6.3 and 11**

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) (refer to **Table 4**).

Holcim is the trading name for Holcim (Australia) Pty Ltd which, as a member of the LafargeHolcim 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 including this 2020 reporting period.

2.1 Quarry contacts

The Lynwood Quarry Works Manager is responsible to the regulatory authorities for all aspects of environmental compliance at the site. The Lynwood Quarry Works Manager's contact details are presented in **Table 4**.

Table 4: Key personnel responsible for environmental management

Name	Role	Company	Contact Details
Declan Close	Quarry Manager	Holcim	0419 476 900
Rebecca McLean	Support Services Supervisor	Holcim	0408 299 267

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 Industry and Environment (DPIE). 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 2020 to 31 December 2020. 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

Conditions		Addressed in Section
Schedule 2 – General Administrative Conditions **Production Data**		
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.	**Section 4.2**
Schedule 3 – Specific Environmental Conditions **Monitoring of Quarry Product Transport**		
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.	**Section 4.2.2**
Schedule 3 – Specific Environmental Conditions **Retirement of Biodiversity Credits**		
48A.	Each Annual Review required under condition 10 of Schedule 5 must record the number of credits retired in the reporting year (or previously) and the area of vegetation expected to be cleared in the forthcoming five years.	**Section 6.7**
Schedule 3 – Specific Environmental Conditions **Waste Management**		
53	The Applicant must: (d) Report on waste management and minimisation on the Annual Review. to the satisfaction of the Secretary.	**Section 6.10**
Schedule 5 – Environmental Management, Reporting and Auditing **Annual Review**		
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:	**This document**
	(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;	**Section 4.0, Section 6.0** and **Section 8.0**
	(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: • The relevant statutory requirements, limits or performance measures/criteria; • The requirements of any plan or program required under this consent; • The monitoring results of previous years; and • The relevant predictions in the documents listed in condition 2(a) of Schedule 2;	**Section 6.0** and **Section 9.2**
	(c) Identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;	**Section 1.0** and **Section 11.0**
	(d) Identify any trends in the monitoring data over the life of the development;	**Section 6.0**

Conditions		Addressed in Section
	(e) Identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of significant discrepancies;	**Section 6.1**
	(f) Describe what measures will be implemented over the current financial year to improve the environmental performance of the development;	**Section 6.0**
	(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;	**Section 6.7**
	(h) Calculate the number of additional Bio Banking (or equivalent) credits that will need to be purchased, before that clearing can be done; and	**Section 6.7**
	(i) Report on the number of Bio Banking (or equivalent) credits that have been purchased to allow ongoing clearing and completion of stages.	**Section 6.7**

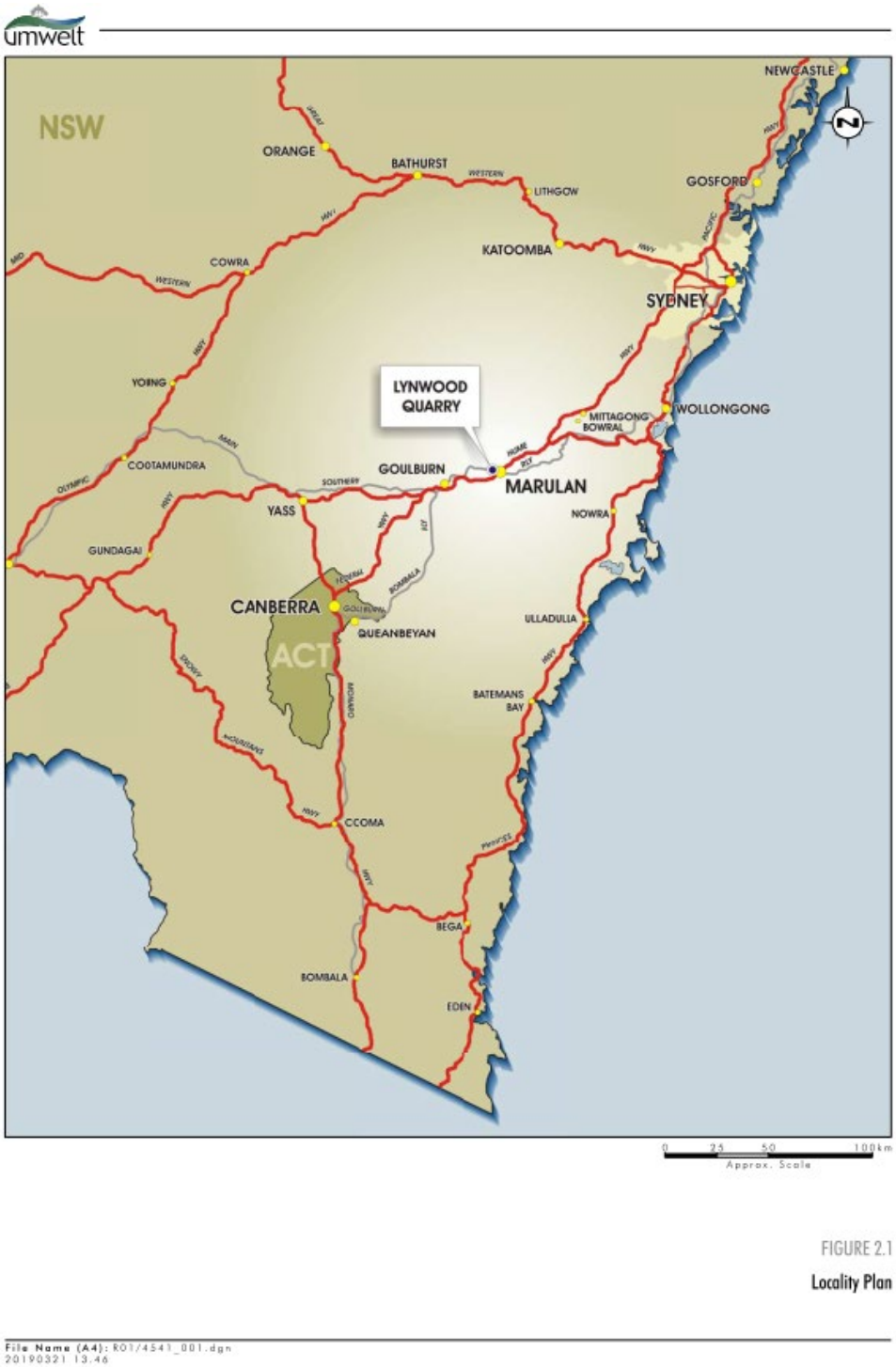


Figure 1: Locality Plan (Umwelt, 2016)

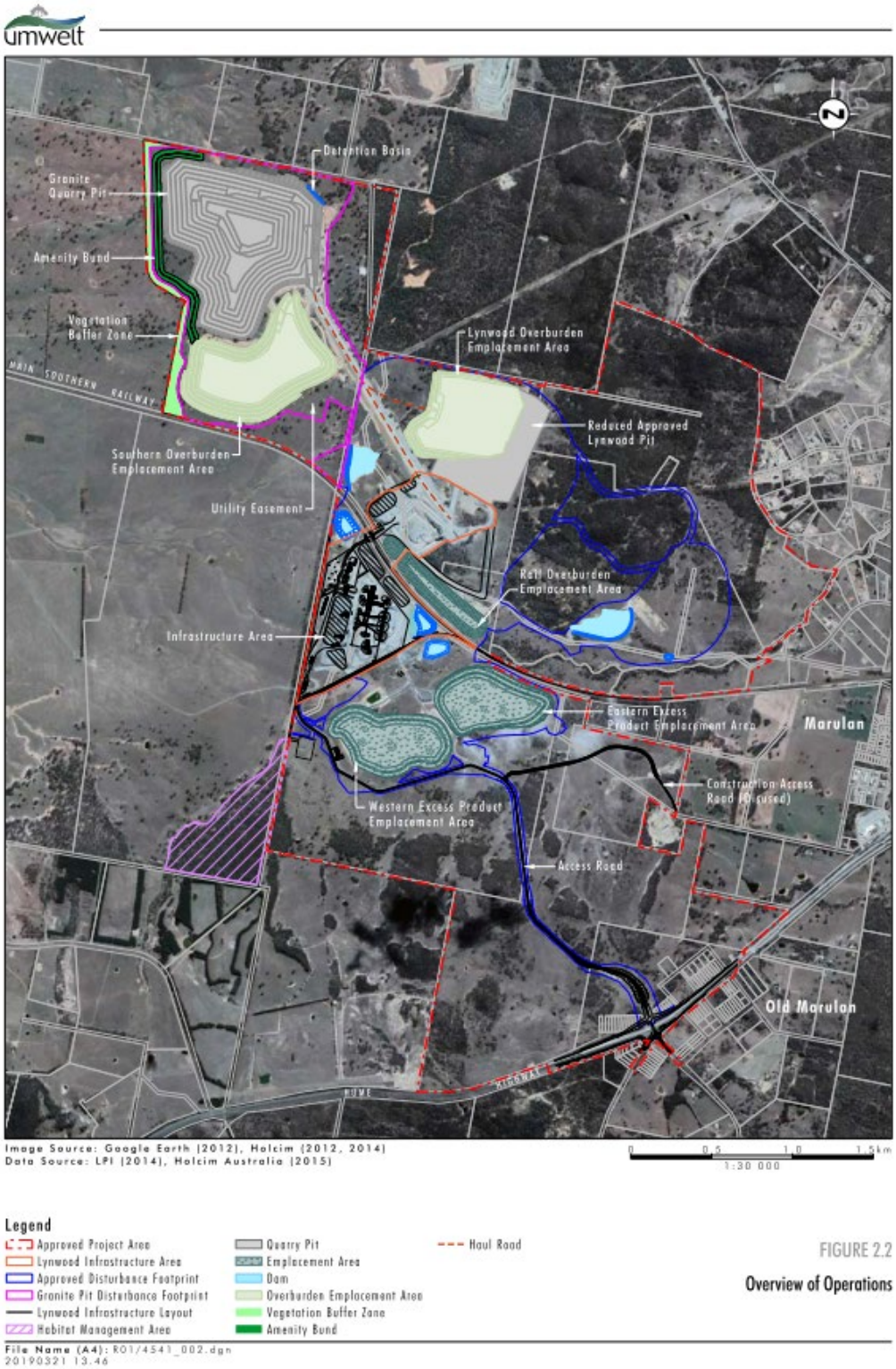


Figure 2: Overview of Operations (Umwelt, 2016)

3.0 Approvals

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

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 and 2017. The Development Consent permits carrying out quarrying operations until 1 January 2038.

On 18 May 2016, Lynwood Quarry was granted modification (MOD 4) to commence quarrying and associated activities in an alternative resource known as the Granite Pit immediately north-west of the existing operations.

MOD 4 of the Development Consent included:

- Development of a new Granite Pit to the west of the existing Approved Pit;
- Construction of an additional haul road, to connect the new Granite Pit to the existing infrastructure, water management structures and other minor additions;
- Emplacement of overburden from the Granite Pit in the Approved Pit;
- Construction of an amenity bund to the west and northwest of the Granite Pit; and
- A reduction in total disturbance area due to a decrease in the Approved Pit disturbance footprint and associated overburden storage and haul roads.

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. Approvals and licences held by Holcim are provided in **Table 6**.

Table 6: Current approvals, licences and leases

Approval and Relevant Legislation	Details
Development Consent (DA) 128-5-2005 (Mod 5) *NSW Environmental Planning and Assessment Act 1979*	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 *Water Management Act 2000*	Obtained for works within 40 m of stream
Part 2 Licence *Water Act 1912 Part 2*	Obtained for surface water capture and use
Part 5 Licence *Water Act 1912 Part 5*	Obtained for groundwater monitoring
Controlled Activity Approval (CAA) No. 10 ERM 2011/0446*Rivers and Foreshores Improvement Act 1948*	Works within the riparian zones on site
Environment Protection Licence (EPL) 12939 *Protection of the Environment Operations Act 1997*	Held by Holcim over the Lynwood Quarry premises.
Water Access Licence (WAL) No. 25575	Obtained under the water sharing plan for the Upper Nepean and Upstream Warragamba Water source (refer to **Section 7.2**)
Aboriginal Heritage Impact Permit (AHIP) No. 1100264 *National Parks and Wildlife Act 1974*	Discussed further in **Section 6.11**.

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). Going forward for management plans the following will be undertaken:

In terms of sub clause b), the requirement to review and update management plans will be assessed during the preparation of each Annual Review. The Annual Review will state which management plans require updating and which management plans do not require updating. Updated versions of management plans will be put on the website once approved.

Management plans have been revised in this report period with comments from the EPA and DPIE taken into account.

The following Management Plans were approved by DPIE in the 2020 Annual Review period:

- Water Management Plan (Dated November 2020) – Approved 16/11/2020
- Noise Management Plan (Dated 2020)
- Blast Management Plan (Dated February 2020)
- Environmental Management Strategy (Dated February 2020)

The management plans that are in the process of being updated and submitted for approval include:

- Rehabilitation and Landscape Management Plan (September 2020)
- Air Quality Management Plan (2020)

4.0 Operations summary

A summary of the operations undertaken at Lynwood Quarry during the report period are included in the following sections.

4.1 Quarrying operations

Full scale quarrying operations were completed within the Lynwood Ignimbrite Pit in March 2018. The small scale of ongoing campaign quarrying in this area reflects the limitations of the quarry resource. Quarrying operations commenced in the Granite Pit in 2017 and continued in 2020.

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 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.

The construction of the earthen visual amenity bund also continued in 2020.

4.2 Production limits

During the report period, a total of 2,257,967 tonnes of quarry product was transported from the quarry by road and rail. This is slightly less than the total production of 2,262,468 tonnes for 2019. In 2020 a total of 1,194,840 tonnes was transported from the quarry by road transport using Hume Highway. Production in 2020 meets the limits on total saleable product and amount of product transported by road outlined in Condition 13 of Schedule 2 of the Development Consent.

Table 7 provides the annual production and transportation volumes for the 2019 and 2020 report periods and also provides a forecast for the 2021 report period.

Table 7: Long-term production summary

Material	Approved limit DA 128-5-2005	2019 (actual) (t)	2020 (actual) (t)	2021 (forecast) (t)	Compliance with criterion
Product - total	5 million tonnes from the site in a year	2,262,468	2,257,967	2,350,000	Yes
Product Transported - Rail	5 million tonnes from the site in a year	1,386,838	1,063,128	1,250,000	Yes
Product Transported - Road	1.5 million tonnes from the site in a year by road	875,630	1,194,840	1,100,00	Yes

4.2.1 Hours of operation

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

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/emplacement; 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, with the 2020 report period road transport tonnages being within the approved limits.

Table 9: Summary of laden trucks movements 2020

Month	Laden Truck Movements	Product by Road Transport (tonnes)
January	2143	73,311.36
February	2139	71,145.08
March	2349	89,068.89
April	3797	111,978.04
May	2999	100,061.41
June	2923	100,115.16
July	2846	104,722.19
August	2962	99,897.43
September	3497	122,019.82
October	3231	110,076.80
November	3269	112,414.23
December	2899	100,029.32
Total	**35,054**	**1,194,839.73**

4.3 Construction activities

Construction of the visual amenity bund commenced in late 2018 with continued construction during the report period. It is expected to be completed during the 2021 report period. Upgrades and modifications to the processing plant and its equipment are proposed for the 2021 report period. All construction activities in 2020 occurred within the project footprint.

5.0 Actions required from previous Annual Review

5.1 Actions from 2019 Annual Review – DPIE Actions

Holcim received comments on the 2019 Annual Review on 4 May 2020 requesting clarification on non-compliances regarding groundwater monitoring, rehabilitation monitoring, and AHMC meetings. These comments addressed in the revised 2019 Annual Review, dated June 2020.

5.2 Action from the 2019 Annual Review – Holcim Proposed Actions

Actions proposed to be undertaken at Lynwood Quarry during this reporting period are detailed in **Table 10**.

Table 10: Actions Required for 2020 Annual Review

Actions from Previous Annual Review	Works Undertaken	Where addressed in this Document
Complete implementation of actions identified in the IEA Action Plan.	Works have been undertaken in 2020 to address those recommendations from the 2019 IEA. Lynwood Quarry has also updated a site Action Plan as a result of the most recent IEA which was conducted in September 2020.	**Appendix 3 – IEA Action Plan**
Implementation of 2020 environmental management plans.	Those Management Plans updated and approved in 2020 have been implemented by the site. Management measures and environmental performance triggers have been implemented on the site in day-to-day activity.	**Section 6 – Environmental Performance.** **Section 7 – Water Management.** **Section 8 – Rehabilitation.**
Revision of the site Rehabilitation Bond before 30 December 2020 in accordance with Development Consent requirements.	This issue was not resolved in 2020. Holcim continues to pursue further consultation regarding issues the site has faced surrounding Biodiversity Credit retirement and the Rehabilitation Bond.	**Section 6.7 – Biodiversity.**
Undertake nest box and fauna monitoring in accordance with the Lynwood Quarry Rehabilitation and Landscape Management Plan.	Annual fauna monitoring was undertaken by a Holcim employee in the report period. Nest box establishment monitoring was also conducted in this report period by a Holcim employee.	**Section 6.7 – Biodiversity.** **Section 8 – Rehabilitation.**
Finalise the Development Approval for the construction and management of the Keeping Place.	Progress was made regarding the process of the construction, ongoing management, and approvals process of the Keeping Place in conjunction with Aboriginal consultation. The Keeping Place is now pending approval by local council and DPIE.	**Section 6.11 – Indigenous Heritage**

Actions from Previous Annual Review	Works Undertaken	Where addressed in this Document
Continued extraction within the Granite Pit.	Extraction continued within the Granite Pit.	**Section 4 – Operations Summary**
Continue works associated with construction of the visual amenity bund to the west of the Granite Pit.	Continued construction of visual amenity bund.	**Section 4 – Operations Summary**

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.

6.1 Summary of performance against EA predictions

The Lynwood Quarry has been subject to three 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 11.**

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
Air Quality (Refer to Section 6.3)	Refer to **Section 6.1.1** Refer to **Section 6.3.2**	Non-compliant due to monitoring equipment failure and Short term criteria exceedances for PM_{10}.	Depositional dust monitoring results continued to trend below impact assessment criteria limits during the report period and remained within historical range. Non-compliance occurred due to monitoring equipment failure and short term PM_{10} exceedances on 10 occasions, (see **Section 6.3**).	Actions to be undertaken are detailed in **Section 6.3**.
Surface Water Quality (refer to Section 6.4)	Refer to **Section 6.1.2 /** Refer to **Section 6.4.2**	Non-compliant	Sampling events for February 2020 missed. Holcim informed DPIE of this. Surface water monitoring results were below impact assessment criteria during the report period and remained within historical range. A number of monitoring sites were dry during the report period therefore no samples were taken at these times.	No additional management or mitigation measures are proposed to be implemented which are outside of the existing approved WMP.

Aspect	Approval Criteria/ EIS Prediction	Performance during the report period	Trend / key management implications	Implemented / proposed management actions
Groundwater (Refer to Section 6.5)	Refer to **Section 6.1.3**/ Refer to **Section 6.5.2**	Compliant	Groundwater monitoring results were below impact assessment criteria during the report period and remained consistent with long-term trends.	No additional management or mitigation measures are proposed to be implemented which are outside of the existing approved WMP.
Noise (Refer to Section 6.6)	Refer to **Section 6.1.4**/ Refer to **Section 6.6.2**	Compliant	Attended noise monitoring results continued to trend below impact assessment criteria during the report period and remained within historical range.	No additional management or mitigation measures are proposed to be implemented which are outside of the existing approved NMP.
Biodiversity (Refer to Section 6.7)	Refer to **Section 6.7.2** Refer to **Section 8.3**	Compliant	Fauna monitoring was undertaken during the reporting period. Refer to **Section 6.7**.	Continue monitoring in accordance with the Rehabilitation and Landscape Management Plan.
Blasting (refer to Section 6.9)	Refer to **Section 6.9**	Compliant	Blast monitoring undertaken during the report period complied with Development Consent and EPL criteria	Continued implementation of the Blast Management Plan during the report period.

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_{10} 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 the 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. PM_{10} results for 2020 were similarly below impact assessment criteria and EA predictions, however there were a number of short-term exceedances as a result of equipment failure, contamination by agricultural activity, disturbances outside the project area, and severe regional bushfires. A summary of these exceedances is represented in **Table 16**.

6.1.2 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 6.4**. All surface water quality results were generally consistent with criteria. Low to little flow was observed at a majority of the sampling events. There was no evidence that the site caused impact to water quality downstream.

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 2020 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. There was a high degree of variability in Sulphate results, however no 2020 results exceeded historical maximums. A discussion of groundwater level and water quality results is provided in **Section 6.5**.

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**.

6.2 Meteorological monitoring

Lynwood Quarry has continued to maintain a weather station (M1) since 3 January 2020. The site uses this meteorological monitoring data to inform daily operations as per the Development Consent. The site is continuing to refine the process of collecting meteorological data and converting this to daily or monthly weather summaries to better inform site operations. As a result, meteorological monitoring results are taken from the Goulbourn BOM weather station to represent the conditions at Lynwood Quarry. A summary of meteorological results for the report period are outlined in **Table 12**.

Table 12: Meteorological Monitoring Results 2020 from Goulburn Weather Station (070330)

Month	Total Rainfall (mm)	Minimum Temperature (°C)	Maximum Temperature (°C)
January	22.0	9.7	42.8
February	128.6	7.9	41.8
March	48.2	2.2	31.0
April	66.4	-0.8	24.1
May	40.6	-4.6	20.6
June	14.4	-6.0	17.1
July	36.6	-6.1	16.2
August	157.8	-5.0	18.1
September	31.0	-2.9	24.2
October	94.4	0.2	26.5
November	85.2	2.2	33.8
December	37.8	1.8	34.4
Annual TOTAL	**763.0**		

Lynwood Quarry received a total of 736mm of rainfall over the 2020 report period. The highest monthly rainfall occurred in August, with 157.8mm falling during this period. Lynwood received the least amount of monthly rainfall in June (14.4mm).

The minimum recorded temperature in the region occurred in July (-6.1°C). The maximum temperature at Lynwood Quarry was 42.8°C in January 2020.

6.3 Air Quality

Lynwood's AQMP was revised in 2020 in consultation with the EPA and is waiting on approval into 2021. Holcim received comments on the revised management plan in January 2020 and September 2020.

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 <10µm (PM_{10}), respectively. Dust monitoring locations are provided in **Figure 3**.

6.3.1 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 13**.

Table 13: Air quality impact assessment criteria

Pollutant	Averaging Period	Criterion
Total suspended particulate (TSP) matter	Annual average	90 µg/ m^3
Particulate matter <10µm (PM_{10})	Annual average	30 µg/ m^3
	24 hour average	50 µg/m^3
Deposited dust	Annual average (maximum total)	4 g/m^2/month
	Annual average (maximum increase)	2 g/m^2/month

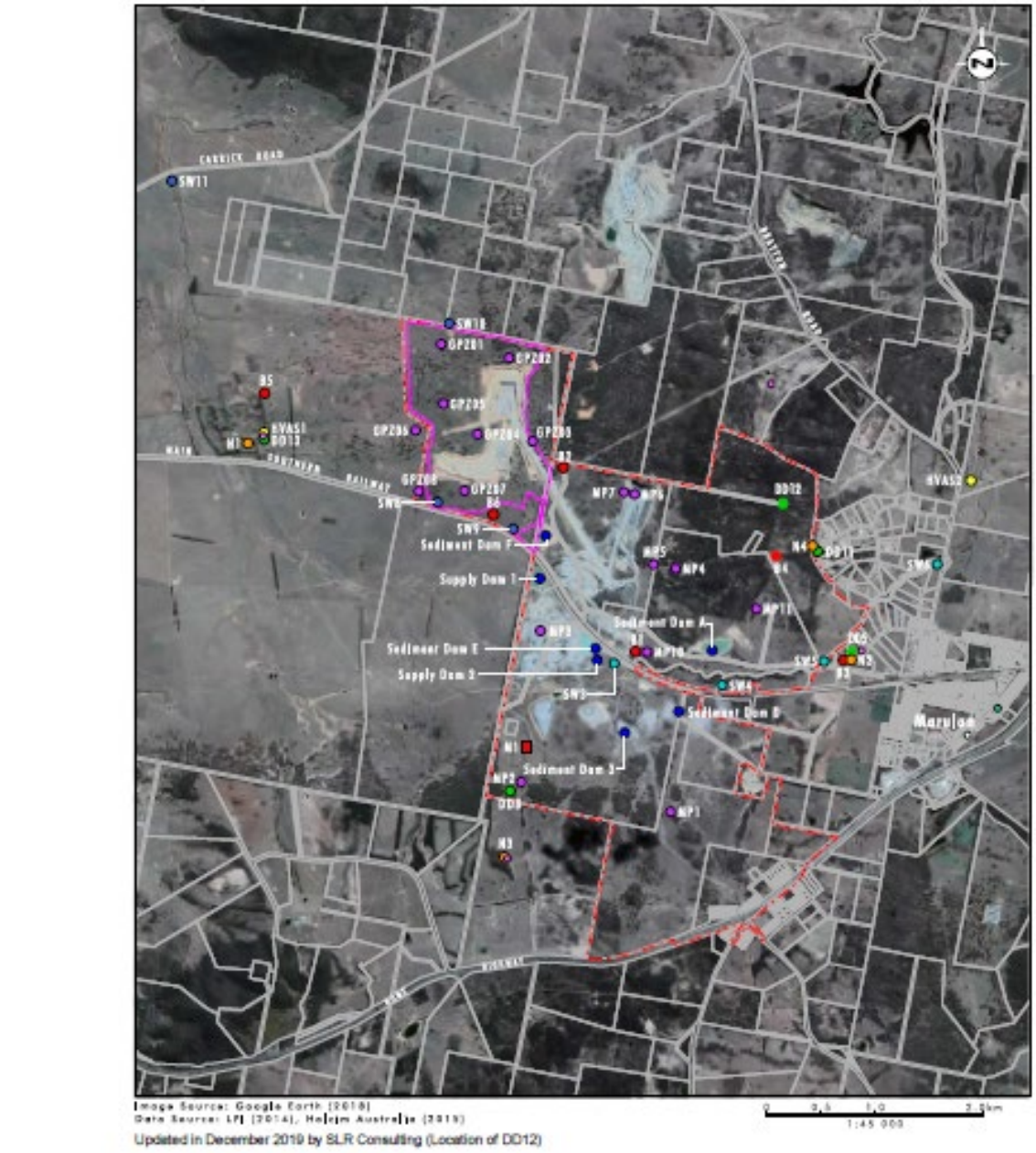


Figure 3: Environmental Monitoring Network (SLR, 2019)

6.3.2 Environmental outcomes

6.3.2.1 Depositional Dust

As noted in **Table 14**, depositional dust monitoring during the report period took place on a monthly basis. All sites were compliant with Development Consent criteria for annual average total deposited dust and ranged between 1.5 – 2.6 g/m^2/month. It should be noted that in the early months of 2020 Australia experienced unprecedented bushfire events which may have impacted air quality results at the site. Elevated results for total insoluble solids as well as ash content in January 2020 reflect the impact of a bushfire that occurred 5km from site. Samples at all gauges in March were affected by rainwater and are thus excluded from the annual average.

Table 14: 2020 Depositional Dust Monitoring Results

Month	Total Insoluble Solids (g/m^2/month)				
	DD5	DD8	DD11	DD12	DD13
January	7.4	6.1	5.8	6.2	7.0
February	1.6	4.1	2.9	4.4	2.8
March	*0.9	*0.7	*1	*0.8	*0.8
April	2.6	1.5	3.1	1.8	8.9
May	0.4	0.4	0.9	0.6	0.4
June	0.9	0.7	0.3	0.9	0.4
July	0.4	0.8	0.5	0.1	0.5
August	0.8	0.6	0.4	0.3	0.7
September	0.5	0.5	1.0	0.5	1.5
October	0.3	0.9	1.9	0.3	1.0
November	2.1	1.9	3.6	1.1	2.8
December	3.3	1.1	3.0	1.3	4.2
Annual Average	1.8	1.7	2.1	1.6	2.7
Minimum	0.3	0.4	0.3	0.1	0.4
Maximum	7.4	6.1	5.8	6.2	8.9

Note: Contaminated samples are marked with an asterisk (*) and are removed from the annual average.

6.3.2.2 PM_{10} / TSP

PM_{10} monitoring via HVAS units 1 and 2 was undertaken during the report period. There were 54 sampling events at HVAS 1 and 55 at HVAS 2 in the report period, as shown in **Table 15**.

Table 15: 2020 PM_{10} Compliance Summary

Category	HVAS 1	HVAS 2
Total number of HVAS monitoring rounds required in 2020	62	62
Number of completed monitoring rounds	52	54
Number of incomplete monitoring rounds, not undertaken, or equipment failure.	10	8

The HVAS was above the short term 24-hour average criteria of 50 µg/m^3 on some of the occasions given in **Table 16**. Other samples include those sampling events that were impacted by equipment failure or contamination.

Table 16: Summary of Non-Compliant PM_{10} monitoring results

Date	PM_{10} (µg/m^3)	Cause
HVAS1		
January 3, 2020	NS	Did not run - issue with date reset. Ecotech advised.
January 9, 2020	NS	Did not run – issues with date reset. Ecotech advised.
January 15, 2020	NS	Did not run - issue with date reset. Ecotech advised.
January 21, 2020	4.9	Did not run - issue with date reset. Ecotech advised.
January 28, 2020	NS	Machine found open & paper had blown away
February 3, 2020	75.7	Regional bushfires
February 9, 2020	NS	Station was found flat (no electricity connected) no reading.
February 14, 2020	1950	Sample error from machine error and ongoing impact from dust storm.
September 25, 2020	5.7	Damaged filter
October 7, 2020	3.1	Damaged filter
HVAS2		
January 3, 2020	NS	Machine error – issue with date reset. Ecotech advised.
January 9, 2020	NS	Machine error – issue with date reset. Ecotech advised.
January 15, 2020	54.4	Bushfire in the local area.
January 28, 2020	NS	Machine error, computer did not run.
February 3, 2020	95.7	Regional bushfires
February 9, 2020	NS	Machine failed to run.
February 14, 2020	NS	Machine failed to run. Ongoing impacts from dust storm.
May 4, 2020	8.2	Misaligned filter.
September 25, 2020	3.9	Damaged filter.

Table 16 displays several non-compliant or high HVAS readings from January and February 2020. Regional bushfires in these first two months of 2020 as well as a bushfire approximately five kilometres from the site in February significantly impacted particulate matter readings at Lynwood.

Table 17 displays the entire monitoring program alongside PM_{10} results at HVAS 1 and HVAS 2.

Table 17: 2020 PM_{10} Monitoring Results

	HVAS 1 (µg/m^3)		HVAS 2 (µg/m^3)	
Sample Date	TSP (Calculated)	PM_{10}	TSP (Calculated)	PM_{10}
January 3, 2020	NS	NS	NS	NS
January 9, 2020	NS	NS	NS	NS
January 15, 2020	NS	NS	130.6	54.4
January 21, 2020	*11.8	*4.9	13.7	5.7
January 28, 2020	NS	NS	2.4	NS
February 3, 2020	NS	NS	NS	NS
February 9, 2020	NS	NS	NS	NS
February 14, 2020	NS	NS	NS	NS

	HVAS 1 (µg/m³)		HVAS 2 (µg/m³)	
Sample Date	TSP (Calculated)	PM_{10}	TSP (Calculated)	PM_{10}
February 19, 2020	5.8	2.4	32.6	13.6
February 25, 2020	22.6	9.4	35.5	14.8
February 28, 2020	84.5	35.2	117.9	49.1
March 5, 2020	15.8	6.6	13.3	5.5
March 11, 2020	19.0	7.9	15.8	6.6
March 17, 2020	20.2	8.4	13.9	5.8
March 23, 2020	35.3	14.7	28.6	11.9
March 29, 2020	15.6	6.5	19.0	7.9
April 4, 2020	16.4	6.8	105.1	43.8
April 10, 2020	13.9	5.8	15.1	6.3
April 16, 2020	56.6	23.6	48.5	20.2
April 22, 2020	44.9	18.7	64.8	27.0
April 28, 2020	43.0	17.9	40.1	16.7
May 4, 2020	19.0	7.9	*19.7	*8.2
May 10, 2020	12.0	5.0	11.8	4.9
May 16, 2020	9.1	3.8	22.6	9.4
May 22, 2020	5.3	2.2	11.3	4.7
May 28, 2020	12.2	5.1	31.4	13.1
June 3, 2020	23.5	9.8	14.4	6.0
June 9, 2020	10.1	4.2	17.3	7.2
June 15, 2020	10.6	4.4	20.9	8.7
June 21, 2020	10.6	4.4	12.7	5.3
June 27, 2020	10.3	4.3	31.4	13.1
July 3, 2020	10.1	4.2	18.0	7.5
July 9, 2020	10.1	4.2	35.0	14.6
July 15, 2020	2.4	1.0	6.7	2.8
July 21, 2020	11.0	4.6	18.2	7.6
July 27, 2020	2.9	1.2	3.8	1.6
August 2, 2020	12.0	5.0	25.4	10.6
August 8, 2020	4.3	1.8	16.3	6.8
August 14, 2020	6.7	2.8	8.9	3.7
August 20, 2020	6.5	2.7	20.4	8.5
August 26, 2020	6.7	2.8	7.2	3.0
September 1, 2020	27.1	11.3	31.2	13.0
September 7, 2020	22.3	9.3	30.0	12.5
September 13, 2020	8.2	3.4	15.6	6.5
September 19, 2020	16.3	6.8	28.8	12.0
September 25, 2020	*13.7	*5.7	*9.4	*3.9
October 1, 2020	17.8	7.4	27.4	11.4
October 1, 2020	17.8	7.4	27.4	11.4
October 7, 2020	*7.4	*3.1	18.2	7.6
October 13, 2020	24.0	10.0	31.7	13.2

	HVAS 1 (µg/m³)		HVAS 2 (µg/m³)	
Sample Date	**TSP (Calculated)**	**PM_{10}**	**TSP (Calculated)**	**PM_{10}**
October 19, 2020	20.9	8.7	22.8	9.5
October 25, 2020	4.1	1.7	7.7	3.2
October 30, 2020	6.7	2.8	8.2	3.4
November 6, 2020	10.3	4.3	12.5	5.2
November 12, 2020	27.8	11.6	48.7	20.3
November 18, 2020	24.2	10.1	27.4	11.4
November 24, 2020	21.1	8.8	19.4	8.1
November 30, 2020	30.2	12.6	33.8	14.1
December 6, 2020	44.6	18.6	38.9	16.2
December 12, 2020	18.7	7.8	16.3	6.8
December 18, 2020	28.3	11.8	32.2	13.4
December 24, 2020	30.7	12.8	30.7	12.8
Minimum (µg/m³)	2.4	1.0	2.4	1.6
Average (µg/m³)	18.6	7.7	27.5	11.7
Maximum (µg/m³)	84.5	35.2	130.6	54.4
Average, excluding contaminated samples (µg/m³)	19.0	7.9	28.0	11.9

Note: Samples impacted by contamination or damaged equipment are marked with an asterisk (*).
TSP has been calculated from PM_{10} results using site conversion factor of 2.4 µg/m³.

6.3.3 Trends in data

6.3.3.1 Depositional Dust

A summary of annual average monitoring results from 2014 to 2020 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 4g/m²/month at all sites. Two sites saw a decrease in depositional dust levels from 2019, while three other sites increased between 0.2 and 0.5 g/m²/month in their averages from 2019. 2020 results from all gauges are consistent with the previous six years.

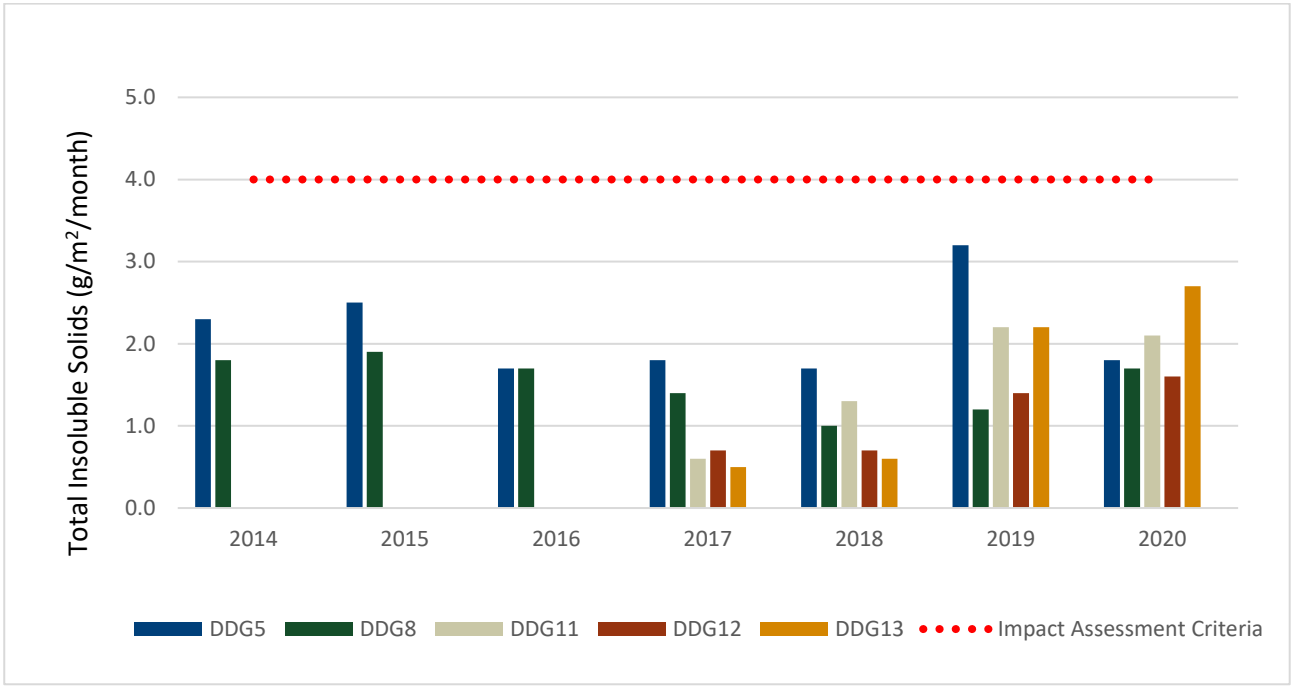


Figure 4: Historical Depositional Dust Monitoring

6.3.3.2 PM_{10}

Annual average PM_{10} 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. Annual averages at HVAS 1 and HVAS 2 in 2019 are higher than all other years represented. In the previous Annual Review, this was attributed to excessive dust generated by drought conditions and particulate matter from heavy bushfire smoke. 2020 results returned to levels more consistent with years prior to 2019. The 2020 annual averages at HVAS 1 and HVAS 2 were 7.9 µg/m^3 and 11.9 µg/m^3, respectively, and were calculated excluding samples impacted by contamination or equipment failure.

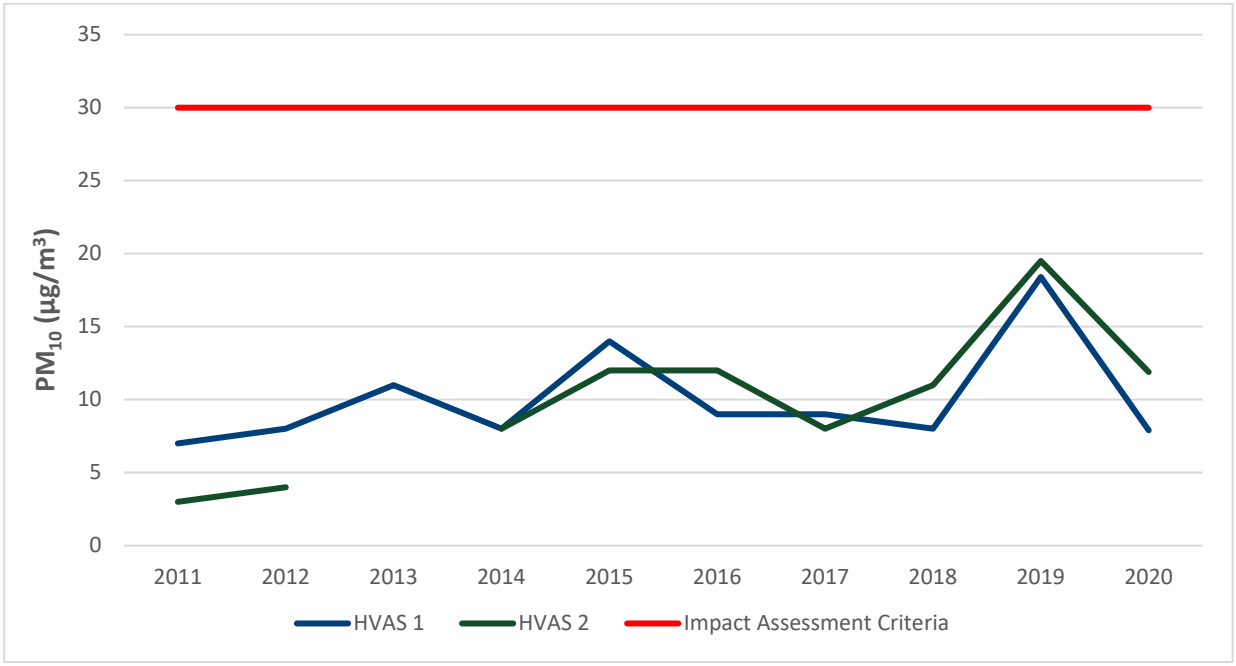


Figure 5: Historical PM_{10} Monitoring Results

6.3.4 Proposed improvements or actions next report period

During 2020 monitoring and air quality management on site aligned with the revised AQMP (2020). This revised AQMP is waiting for approval by DPIE, with the draft last updated in September 2020.

The replacement of HVAS air quality monitoring with Beta Attenuation Monitoring (BAM) monitoring has been identified in this reporting period as a potential improvement of air quality monitoring. Lynwood experienced ongoing issues with the reliability of HVAS equipment throughout 2020, particularly for the months of January, February, and September. As a result, Lynwood has committed to replacing HVAS instruments with a BAM system, with the transition occurring in 2021.

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 DPIE 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. There were no changes to the on-site water management system during 2020, with only minor changes completed in 2019.

6.4.2 Performance criteria

6.4.2.1 Surface Water Monitoring Criteria/Trigger Levels

Trigger levels have been updated and included in the 2020 Water Management Plan within the Surface Water Monitoring Program. These new trigger levels are outlined in **Table 18** and have been based on an extended period of monitoring data from Lynwood surface water (SW) locations.

Table 18: Surface Water Criteria – Revised 2020 Criteria from Surface Water Management Plan

Water Quality	Trigger Value			
Variable	**[3] SW 1 and 2 (Marulan Creek) SW 3 and 4 Joarimin Creek SW 7 Lockyersleigh Creek**	**Joarimin Creek (SW4-SW6)**	**SW8 to SW11**	**[4] 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[1]
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 none visible	10 mg/L or none visible	10 mg/L or none visible[1]
Total Suspended Solids		Less than 320 mg/L	Less than 320 mg/L [2]	50 mg/L[1]

Notes:
[1] Triggers marked with [1] are from Schedule 3 Condition 17;
[2] 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.
[3] SW1 – 3 are no longer monitored, hence there are no proposed criteria. SW7 is also no longer monitored.
[4] 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. Surface water quality sampling was 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. In this report period there were several sampling events where very low water flows were observed. This is reflected in the high total suspended solids results at a number of sampling locations.

Table 19: Summary of Results – Surface Water 2020

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	
SW5	489.3	578.4	748.0	6.8	7.3	7.6	4.0	16.3	45.0	5.0	5.8	10.0	0.0	0.1	0.2	0.2	1.6	3.6	Flow (8), No Flow (1)
SW6	325.9	610.2	906.0	6.9	7.4	7.9	2.3	11.0	25.0	5.0	5.8	10.0	0.0	0.1	0.1	0.4	2.3	12.1	Flow (8), No Flow (1)
SW8	202.5	318.2	477.6	7.5	8.0	**8.7**	22.0	322.6	**830.0**	5.0	6.3	**14.0**	0.0	0.2	0.6	2.7	4.4	5.6	**Flow (0), No Flow (9)**
SW9	279.8	873.1	1614.0	6.9	7.4	**7.9**	4.1	74.9	230.0	5.0	6.2	10.0	0.0	0.1	0.5	0.8	3.2	7.2	**Flow (2), No Flow (7)**
SW10	2367.0	2969.3	**4087.0**	6.6	7.0	7.8	5.3	134.6	**750.0**	5.0	6.0	10.0	0.1	0.3	0.8	0.3	1.2	4.6	**Flow (1), No Flow (8)**
SW11	1090.0	2095.2	3553.0	6.6	7.2	7.6	1.2	342.4	**1900.0**	1.0	5.6	10.0	0.0	1.7	14.0	0.5	8.1	70.0	Flow (6), No Flow (4)

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

SW4

The Surface Water Monitoring Program in the Surface Water Management Plan (2020) suggests monitoring would recommence at SW4 from Quarter 2 of 2020. However, monitoring at this location did not occur through the reporting period and is thus absent from the surface water monitoring results in **Table 19**. SW4 has the same trigger values as the Joarimin Creek downstream monitoring locations, SW5 and SW6.

SW5

A summary of SW5 monitoring results is provided in **Table 19**. Monitoring was undertaken on nine occasions during the report period, with none occurring for the months of January, February, nor March. Water was flowing at this point the majority of sampling occasions. The frequency of water flow at SW5 increased notably from 2019 when a flow was observed on just 3 occasions. All results at SW5 during the 2020 report period were below trigger levels described in **Table 18**.

- The annual average pH is 7.3 with a maximum of 7.6 which is within the required 2020 trigger level of 5.8 - 9.7.
- EC results indicate an annual average of 578.4 µS/cm and maximum value of 748.0 µS/cm. These results are less than those gathered in 2019 but are consistent with historical values.
- Total suspended solids (TSS), Phosphorous, and Nitrogen results were within the trigger values.
- From 2019, the annual average for pH, TSS, Oil and Grease, and Nitrogen increased but were within historical trends.

SW6

A summary of SW6 monitoring results is provided in **Table 19**. Monitoring was undertaken on nine occasions during the report period, with none occurring for the months of January, February, nor March. Flow conditions were experienced during the majority monitoring times with sampling undertaken on eight out of nine occasions. There were no exceedances in the trigger values outlined in **Table 18** in 2020 at SW6.

pH results were within the minimum and maximum trigger values for Joarimin Creek and consistent with long-term results, with the difference between the 2020 maximum and 2019 maximum equal to 0.1 pH units.

Salinity (EC) and TSS decreased from 2019 levels.

Nitrogen and phosphorous levels were within long-term trends for much of the year. However, nitrogen levels in July 2020 reached a maximum of 12.1 mg/L which is elevated compared to historical results.

SW8

A summary of SW8 monitoring results is provided in **Table 19**. Monitoring was undertaken on nine occasions during the report period, with none occurring for the months of January, February, nor March. There was no flow observed at SW8 for all the sampling events.

The maximum results for pH, TSS, and Oil and grease went above the maximum trigger values as seen within **Table 18**. These results may be attributed to the low to no water flow observed at the site at the time of sampling, rather than a result of quarrying activities.

Phosphorous and nitrogen results were high at SW8 in 2020 compared to historical levels represented in the Lynwood Water Management Plan. Several results in 2020 also exceed those trigger levels in place previous to the 2020 criteria, with trigger levels being 0.21 mg/L for Phosphorous and 2.1mg/L for Nitrogen.

The elevated levels in this report period are most likely attributed to those “no flow” sampling occasions in which actual nutrient levels in the surface water could not be accurately represented.

SW9

Monitoring was undertaken on nine occasions during the report period, with none occurring for the months of January, February, nor March. There was no water flow at this monitoring point for seven of these sampling events.

There was one result that exceeded the pH maximum trigger, at 7.9 pH. The average pH at this point, however, was within the criteria range and displayed little variability from neutral pH.

EC, TSS, and Oil and grease were within their respective trigger values.

Phosphorous and Nitrogen were generally consistent with historical results but did reach maximum values above historical averages. This is particularly true for the no flow months of May when the nitrogen reading was 7.16 mg/L and June when phosphorous equalled 0.51 mg/L.

SW10

Monitoring was undertaken on nine occasions during the report period, with none occurring for the months of January, February, nor March.

There was only one occasion in the report period where water flow was observed at this monitoring point. This low flow volume at this location impacted surface water quality results for TSS and EC, with November and June results exceeding criteria values, respectively. However, the annual averages for TSS and EC were within trigger value range.

pH at SW10 was within the trigger level range for all sampling events.

Phosphorous and nitrogen levels were consistent with 2019 results and former trigger levels on those sampling events where water was flowing. The annual average was elevated due to those results taken when there was no water flow at the site.

SW11

Monitoring was undertaken on eight occasions during the report period, with none occurring for the months of January or March. Water flow was observed on six out of the ten sampling events at this location.

The TSS maximum trigger value was exceeded in May and December 2020, with respective results of 900mg/L and 1900mg/L. On both of these sampling events there was no flow observed at the site.

All other physical parameters were within the surface water criteria for SW11.

Phosphorous and nitrogen reached high maximums in December 2020. Monitoring notes from this sampling event comment on the extremely stagnant, low water flow at SW11. All other phosphorous and nitrogen results were considerably below historical maximum readings and trigger levels.

6.4.4 Trends in data

Results taken from SW5 and SW6 in this report period were highly consistent with historical monitoring data for all parameters. Salinity and total suspended solids levels were low in 2020 compared to long-term results. The data variability was low for pH, with the 2020 results range low. Oil and grease levels in 2020 in Joarimin

Creek increased from 2018 and 2019 levels, but did not exceed the updated trigger levels. Phosphorous and nitrogen levels in 2020 were consistent with historical levels.

Samples for locations SW9, SW10 and SW11 could not be compared to previous monitoring data due to dry conditions experienced during the 2019 monitoring period and continuing dry conditions in 2020.

6.4.5 Proposed improvements

Future Annual Reviews 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 DPIE 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 20**.

6.5.2.2 Groundwater Quality Monitoring Criteria/Trigger Levels - 2020

Trigger levels have been updated in the 2020 WMP and are included in **Table 20**. These new trigger levels are based on an extended period of monitoring data from Lynwood GW locations.

Ground water monitoring is required to occur quarterly.

Table 20: Groundwater Monitoring Criteria for MP Series Bores (WMP, 2020)

Parameter	Minimum Trigger	Maximum Trigger	General comment
MP Bores			
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.
GPZ Bores			
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 21**.

Monitoring was undertaken at the required frequency (quarterly) 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 21: Summary of Results – Groundwater 2020

Site	Depth to Water Level (m)			pH			EC (µS/cm)			Sulphate (mg/L)			Total Nitrogen (mg/L)			Total Phosphorous (mg/L)		
	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max
MP Bores																		
MP1	2.01	2.25	2.38	6.4	6.7	7.2	907	991	1096	24	26	27	0.2	0.2	0.2	0.4	0.9	1.2
MP2	16.56	16.59	16.63	5.9	6.5	6.9	260	393	498	5	13	31	0.2	0.2	0.3	0.0	0.1	0.1
MP4	19.35	19.88	20.36	6.6	7.0	7.5	446	480	531	5	5	5	0.2	0.3	0.4	0.1	0.1	0.2
MP5	20.72	20.94	21.39	6.7	6.8	6.9	679	783	959	5	5	6	0.5	0.7	0.8	0.1	0.1	0.1
MP7	17.48	17.97	18.26	6.6	7.1	7.5	5165	6626	7777	26	32	43	0.2	0.2	0.2	0.0	0.0	0.0
MP10	5.18	5.57	5.88	6.6	6.7	6.8	6383	6629	7039	25	31	42	0.2	0.3	0.4	0.0	0.0	0.0
MP11	11.88	12.39	12.81	7.0	7.2	7.5	712	732	757	5	10	25	0.2	0.4	0.6	0.4	0.5	0.5
GPZ Bores																		
GPZ1	11.68	11.79	11.88	7.3	7.4	7.6	802	878	976	14	20	34	0.2	0.3	0.4	1.2	1.6	**2.1**
GPZ2	30.33	30.36	30.39	7.0	7.1	7.2	2783	2988	3192	25	31	37	0.4	0.9	1.4	0.8	1.2	**1.6**
GPZ5	8.20	8.43	8.78	7.5	7.6	7.8	3079	3301	3501	5	8	15	0.6	1.0	1.4	0.7	1.2	**2.3**
GPZ6	5.64	5.93	6.16	6.9	7.2	7.3	1318	1601	1794	26	29	31	0.2	0.4	0.6	0.8	1.9	**2.6**
GPZ8	8.80	8.98	9.21	7.0	7.1	7.2	1928	2205	2437	5	9	22	0.9	1.1	1.4	0.1	0.1	0.1

Note: Minimum and maximum results that fall outside of the groundwater monitoring criteria are in **bold**.

6.5.3.1 Depth to groundwater

Groundwater levels at MP series bores remained within the historical range of depth and were consistent with those for 2019. The most notable change was for the annual average depth to water level at MP2 which increased from 13.5m in 2019 to 16.59m in 2020. There was some recharge in water table level at some of the bores between 2019 and 2020.

Groundwater levels were consistent with historical ranges and 2019 results for the majority of GPZ bores. The exception to this is GPZ2 which reached a depth of 30.39m in quarter 2 2020, which exceeds the historical level of water furthest from the ground of 28.05m from 2005-2010 data.

Bore GPZ2 exceeded the historical maximum bore depth due to its location in the granite pit and the interaction between the increase in pit size and the water table level. GPZ2 ceased to be monitored in quarter 3 of 2020 due to the expansion of the granite pit causing its complete collapse.

6.5.3.2 pH

Groundwater results for MP and GPZ series bores were near neutral pH in 2020. MP bores were within the trigger criteria range of 4.2 to 9.5. GPZ bores were within the historical range of 6.1 to 7.8. GPZ5 reached the maximum value of 7.8 in Quarter 2 but did not exceed this trigger. There was no significant change in annual averages between 2019 and 2020 at any of the monitoring points, with the largest change being 0.7 units at MP4.

6.5.3.3 Electrical Conductivity

The electrical conductivity levels varied between each MP series bore. However, all 2020 samples were within the trigger levels and historical range of 170 µS/cm to 11,521 µS/cm.

GPZ series bores were within the historical range given in the WMP of 604 µS/cm to 8,020 µS/cm. The annual average for this report period at GPZ2 and GPZ5 decreased from 2019 averages by 815 µS/cm and 429 µS/cm, respectively. The change at GPZ2 can be linked to the gradual deterioration of the bore due to the extension of the pit.

6.5.3.4 Nutrients

Sulphate

For all MP and GPZ bores, the 2020 annual average for sulphate was less than that for 2019. All bores were considerably less than the 2020 investigation maximum value and were within the trigger levels. MP bores ranged from 5 mg/L to 43 mg/L in 2020. GPZ series bores ranged from 5 mg/L to 37 mg/L in 2020.

Total Nitrogen

All MP monitoring sites were within the trigger levels and did not reach the maximum of 2.2 mg/L for total nitrogen levels in 2020. MP series bores ranged from a minimum of 0.2 mg/L to a maximum of 0.8 mg/L.

All GPZ series bores remained within the total nitrogen trigger levels in the report period. GPZ bore results ranged from a minimum of 0.2 mg/L to maximum of 1.4 mg/L. Results for nitrogen at all monitoring points were consistent with the previous report period.

Phosphate

All total phosphorous monitoring results at the MP series bores were below the maximum trigger level of 3.02 mg/L.

The 2020 averages at GPZ1, GPZ2, GPZ5, and GPZ6 for Total Phosphorous were elevated compared to 2019 results. GPZ1 recorded exceedances of the trigger level of 1.2 mg/L in quarters 1, 3, and 4. GPZ2 and GPZ5 also recorded exceedances in quarter 2, with respective values of 1.6 and 2.3 mg/L. GPZ6 had exceedances in quarter 1 (2.6 mg/L), quarter 2 (2.5 mg/L), and quarter 4 (1.9 mg/L).

It should be noted quarrying activities would not have impacted the results of the nutrient testing.

6.5.4 Proposed improvements

Future Annual Reviews will continue to compare results against longer term trends and trigger levels from the WMP. Holcim are committed to continuously improving groundwater data collection at Lynwood Quarry. No further monitoring will occur at GPZ2 due to the pit expansion.

6.6 Noise

6.6.1 Environmental management measures

The Lynwood Noise Management Plan (NMP) has been updated and implemented in the 2020 report 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 2020.

6.6.2 Performance criteria

Noise impact assessment criteria for monitoring are specified in the Development Consent are outlined in **Table 22** below.

Table 22: Noise criteria

Location	Day (7am to 6pm)	Evening (6pm to 10pm)	Night (10pm to 7am)	
	dBA, $LA_{eq(15min)}$	dBA, $LA_{eq(15min)}$	dBA, $LA_{eq(15min)}$	dBA, $LA1_{(1min)}$
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 Muller Acoustic Consulting 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:

- 4th and 6th February 2020;
- 21st and 22nd April 2020;
- 16th, 17th, and 18th September 2020; and
- 9th and 11th November 2020.

Noise monitoring occurred at the locations shown in **Figure 3** and listed in **Table 23**. 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).

It was identified that Lynwood Quarry ranged from inaudible to audible throughout the report period, with site vehicle movements, vehicle reversing alarms, the processing plant, and general quarry hum contributing

to noise emissions. There were no exceedances of the impact assessment criteria detected during quarterly monitoring conducted during the report period as shown in **Table 24**.

Table 23: Noise Monitoring locations

Location	Address
N1	Residence west of the project area
N2	End of Maclura Drive, Marulan
N3	Residence to the south of the site
N4	North-eastern boundary of the project area at rural residential subdivision, (Dorsett Road).

Table 24: Day Time Noise Monitoring Summary

Location	Criteria	Q1	Q2		Q3	Q4		Compliance Status
			21/04/2020	22/04/2020		9/11/2020	11/11/2020	
Day dBA, $LA_{eq(15min)}$								
N1	35	<32	<30	<30	<30	<33	<30	Compliant
N2	35	<30	<30	<30	<30	<30	<35	Compliant
N3	35	<35	<35	<35	<35	<33	<34	Compliant
N4	35	<30	<30	<35	<30	<35	<35	Compliant
Evening dBA, $LA_{eq(15min)}$								
N1	35	<30	No Operations	No Operations	No Operations	No Operations	No Operations	Compliant
N2	35	<30	No Operations	No Operations	No Operations	No Operations	No Operations	Compliant
N3	35	<32	No Operations	No Operations	No Operations	No Operations	No Operations	Compliant
N4	37	<30	No Operations	No Operations	No Operations	No Operations	No Operations	Compliant
Night dBA, $LA_{eq(15min)}$								
N1	35	No Operations	No Operations	No Operations	<35	No Operations	No Operations	Compliant
N2	35	No Operations	No Operations	No Operations	<35	No Operations	No Operations	Compliant
N3	35	No Operations	No Operations	No Operations	<35	No Operations	No Operations	Compliant
N4	35	No Operations	No Operations	No Operations	<30	No Operations	No Operations	Compliant

Note: For grey cells, no operations were occurring during this monitoring time (evening and night).

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 the 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 25** below. It is noted that the current status of credits which have been retired are detailed in **Table 26**.

Table 25: Summary of Biodiversity Credits to be Retired

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

Credit Type Ecosystem Credits	Credits to be Retired
Total	**1,725**

6.7.3 Environmental outcomes

Lynwood retired a total of 3,669 Biodiversity Credits during 2018 with no biodiversity credits retired in 2019. An outcome of the 2020 IEA was for Lynwood to continue consultation with DPIE regarding biodiversity credits and the process of retiring these. Discussions on these obligations will continue into 2021. 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 26**.

Lynwood cleared approximately 9 ha in September 2020 as part of operations for the Granite Pit Extension Area. In accordance with the Development Consent and Lynwood Quarry Extraction Quarry Area Modification Biodiversity Assessment Report (2015), pre-clearing and post-clearing reports were produced to identify significant habitat features inside the Granite Pit Extension Area and report on the ecological results of the clearing. Some recommendations from the Pre-Clearing Survey Report (NARLA, 2020) were implemented in the clearing on the 22 and 23 September 2020.

Ecological monitoring was undertaken by an external contractor during the reporting period. Nest box inspections were also done by a Holcim employee.

Table 26: 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 (*Petaurus norfolcensis*)	1,725	Complete	0

6.7.4 Trends in data

During the 2020 report period, ecological monitoring was completed over the months of August, November and December. The 2020 nest box monitoring was conducted on a total of 50 nest boxes in Winter. From this monitoring it was found:

- Eight nest boxes were inhabited by native fauna including sugar gliders (*Petaurus breviceps*), a brushtail possum (*Trichosurus vulpecula*), and Australian Wood Duck (*Chenonetta jubata*);
- 41 nest boxes contained nesting material;

- Two nest boxes contained deceased Sugar Gliders. These boxes were also occupied by pests, including either an inactive wasp next or beehive; and
- Nine nest boxes required maintenance.

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 (*Hypercium perforate*). Weed management is conducted in accordance with the Rehabilitation and Landscape Management Plan (Umwelt, 2018).

Lynwood undertook weed inspections during the report period. Weed management activities included spot weed control of Blackberry species. Biodiversity and rehabilitation monitoring in 2020 found serrated tussock continues to be a dominant weed species across the site.

No additional management measures outside of the existing approved RLMP are proposed for implementation during the next report period.

6.8.2 Feral animals

No feral animal management activities took place at Lynwood Quarry during the report period.

Findings of the rehabilitation and ecological monitoring noted an opportunity to monitor for feral animals such as foxes, cats, and rabbits to determine the prevalence of pests.

6.9 Blasting and Vibration

6.9.1 Environmental management measures

The BMP was revised in 2020, with this sent to DPIE 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 2020 blasts in **Table 27** shows that all blasts met airblast overpressure and ground vibration impact criteria for the report period. There was a total of 90 blasts in 2020 with 5 of these in the Ignimbrite Pit and 85 in the Granite Pit.

6.9.2 Performance criteria

Blasting performance criteria is set out in the EPL and Development Consent as outlined in **Table 27.**

Table 27: 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 27**. Blast monitoring data is provided in **Appendix 1**. 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 28**.

Table 28: Blast Monitoring Summary

Parameter Summary	Number of Blasts 2020	Percentage of Blast (%)
Total Number of Blasts	90	N/A
Blasts in Ignimbrite Pit	5	6%
Blasts in Granite Pit	85	94%
Blasts exceeding allowable overpressure criteria	0	0%
Blasts exceeding allowable ground vibration criteria	0	0%
Blast Capture Rate (%)	100%	100%

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.

6.9.5 Proposed improvements during Report Period

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. There were 59 instances of waste collected in 2020. A summary of the types and quantities of waste generated during the report period is provided in **Table 29**.

Table 29: Long-term Summary of Waste Generation

Waste	2020	2019	2018
Cardboard (t)	0.37	1.8	47
General Waste (t)	48.8	54.7	201.1
Steel (t)	84	90.28	106.96
Rubber (t)	*Included in General Waste*	*Included in General Waste*	14.24
Wood (t)	4.1	4.5	3.24
Oily Water (t)	-	*Included in Used Oil*	5.36
Used Oil (L)	-	46,100	42,760
Oil Filter (number of bins)	18	20	24
Rags (number of bins)	*Included in General Waste*	*Included in General Waste*	1
Grease (L)	40,000 *used in 2020*	0	4

The amount of waste generated by the site decreased significantly between 2018 and 2019. This trend of declining waste continued for 2020 when 48.8t of general waste was generated compared to 54.7 t in 2019. Cardboard and steel waste has also declined since previous report periods. Waste records for 2020 had recorded no volumes for the other categories of waste such as batteries or rubber.

6.11 Indigenous heritage

An Aboriginal Heritage Management Plan (AHMP) (Umwelt 2018) 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 AHMP (Umwelt 2011) and AHIP (#1100264) (including relevant permit variations), 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.

Monitoring process is undertaken in either November or December each year and reported to the Office of Environment and Heritage (OEH).

The annual site monitoring on the Lynwood Quarry project area was conducted on the 23 and 24 November 2020. This monitoring within the Lynwood Quarry project area found most sites were being

managed in accordance with the relevant requirements. Vegetation in these areas has improved since the previous report period. While no Aboriginal sites had been adversely impacted by quarry activities, a number of management recommendations were identified during the November 2020 site monitoring and continue to be resolved by Holcim including through adjustments made to the Aboriginal Heritage Management Plan to be approved in future report periods.

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 with this completed during 2020. During the report period AHMC meetings were held on the 9 February and 24 November 2020.

Discussions between Holcim and representatives from Aboriginal stakeholder groups continued into 2020 concerning an establishment of a Keeping Place facility on the quarry site. These discussions were centred around Cultural Awareness Training, maintenance of sites, construction, ongoing management, and the approvals process.

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 is ongoing.

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. The revised AHMP (Umwelt 2018b) was prepared in 2017 and provided to the registered Aboriginal parties for their review in early 2018. Following registered Aboriginal party review the AHMP was finalised and provided to DPE (now DPIE) in July 2018.

Holcim is in the process of updating the Lynwood Quarry Aboriginal Heritage Management Plan in 2021.

6.12 Non-indigenous heritage

No additional European Heritage management actions were undertaken during the 2020 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.

During the report period bushfires occurred across the local region, with the closest bushfire taking place 5 km away from site in January 2020. Fuel reduction activities were not undertaken due to the drought conditions & the extreme fire risk late in the year.

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. There were no incidents related to public safety during the report period.

7.0 Water management

7.1 Water management system

The WMP was revised in this report period and approved by DPIE on 16 November 2020. Lynwood manages site inflows such as runoff, groundwater inflow, and external water sourced from Johnniefields Quarry Dam as well as discharge events per this WMP. The site is also 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 6.1** 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.

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 2020 a total of 5 ML was pumped from the Johnniefields Dam for use onsite. This is below the water sourcing limit under the landholder's agreement. **Table 30** provides a summary of water take during the report period.

Table 30: 2020 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	5 ML	5 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 the 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 in regard to 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

There were limited opportunities for rehabilitation at Lynwood Quarry during 2019. Construction of the visual amenity bund to the west of the Granit Pit also commenced in late 2018 and continued throughout 2020. Sections of the bund were temporarily stabilised in 2020. Some topsoil stockpiles underwent temporary seeding with the aim of establishing ground cover and reducing soil substrate loss from these. This material is planned for use in the rehabilitation of the site following the completion of quarrying operations.

The total active disturbance increased during the report period as operations progressed within the Granite Pit and associated emplacement area. Construction of the visual amenity bund to the west of the Granit Pit was continued during the report period. The rehabilitation status for Lynwood Quarry is presented in **Table 31**.

Table 31: Rehabilitation status

Quarry Area Type	Previous Report Period (actual) 2018 (ha)	Previous Report Period (actual) 2019 (ha)	This Report Period (actual) 2020 (ha)	Next Report Period (forecast) 2021 (ha)
A. Total quarry footprint (all areas including active disturbance areas and rehabilitation areas)	36	42	42	50
B. Total active disturbance (areas within the footprint still requiring rehabilitation)	208	216	216	256

Quarry Area Type	Previous Report Period (actual) 2018 (ha)	Previous Report Period (actual) 2019 (ha)	This Report Period (actual) 2020 (ha)	Next Report Period (forecast) 2021 (ha)
C. Land being prepared for rehabilitation	0	0	0	0
D. Land under active rehabilitation*	0	0	11	11
E. Completed rehabilitation (areas that have achieved completion criteria and been signed-off by DRG)	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 and 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 2020 as per the RLMP.

Rehabilitation of 11ha within the Conservation Area was undertaken in 2019 and continued into 2020. Tree planting over an area of several hectares was undertaken in 2020 to establish a windbreak for product stockpiles. Preparation of this area was completed and included spraying, ripping, planting and seeding.

The rehabilitation monitoring was undertaken in 2020 to assess fauna assemblages, establish baseline conditions for retained vegetation, and monitor vegetation health. The health of the site retained vegetation was classed as moderate, with natural regeneration occurring in zones R3 and R4 in particular. The assemblage of native species on the site was determined to be good, however the majority of those observed were birds or micro chiropteran bats. Hoary Sunray populations were good, however at two of these monitoring locations minor erosion and rubbish from the neighbouring waste centre was observed.

9.0 Community

9.1 Community Engagement

9.1.1 Community Consultative Committee Meetings

Two community consultative committee (CCC) meetings were held in 2020 with meetings on 24 July 2020 and 30 October 2020. These meetings discussed general site operations, an update on the Granite Pit, community engagement, complaints, 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 numerous community-based activities during the report period. These activities are presented in **Table 32**. 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 32: 2020 Community Engagement Activities and Sponsorship

Community Activity	Amount Funded in 2020
Marulan Kite Festival – 2020 event CANCELLED	$3,000
Marulan Pony Club	$1,500
Goulburn & District Show Jumping Club	$500
Tallong Apple Festival	$2,000
Marulan Christmas Carols	$3,500
Goulburn Hockey Club	$3,000
Goulburn Cricket	$3,000
Marulan Soccer Club	$5,000
Goulburn Rugby	$3,000
Mayoral Charity Golf Day	$5,000
Goulburn Australia Day BBQ	$1,000
Tallong Public School Father's Day	$600
Lion's Club BBQ	$500
Marulan Australia Day BBQ	$1,500

Many community events were cancelled in the report period due to the Covid-19 pandemic. This impacted the capacity for Lynwood Quarry to engage or sponsor community programs.

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 $50,000.00 annually for projects which contribute to the goals of the community.

Lynwood's 2015-2019 CIF Plan was updated in this report period. As a result of this update as well as Covid-19 restrictions, funding from the CIF did not become available until the second half of the report period. Both the current 2020 CIF Plan and CIF Application Form are on the Lynwood Quarry website and available to the public.

Table 33 details the approved CIF funded projects since the CIF inception.

Table 33: 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

Project Name	Total Approved
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)
Tallong Community Focus Group – Defibrillator	$ 2,572 (funded in 2019)

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 1300 657 051 which 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 DPIE 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 2020 is presented in **Table 34**. Lynwood Quarry received a total of 7 complaints during the reporting period. Complaints received consisted of:

- Three blasting complaints;
- Two air quality complaints;
- One traffic complaint; and
- One “other” complaint (local traffic).

These complaints were managed in accordance with the complaints management and dispute resolution procedure detailed in the EMS (2020).

As a result of consistent community complaints on air quality in previous report periods, Lynwood has consulted with EPA and DPIE on the improvement of air quality controls, as well as incorporated Pollution Reduction Program (PRP) titled “Lynwood Dust Management Improvement Plan” into their EPL. A notice of variation of EPL 12939 from the EPA was sent to the Lynwood Quarry Manager on 28 August 2020 to confirm the site’s satisfactory fulfilment of the requirements of this PRP and thus its removal from the EPL. The site has also updated its Air Quality Management Plan and is waiting for this to be approved by DPIE. The reduction of air quality complaints in 2020 from 2019 and 2018 is testament to Lynwood’s implementation of air quality management strategies.

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 34: Comparison of complaints for Lynwood 2014 - 2020

Complaint Type	2014	2015	2016	2017	2018	2019	2020
Noise	0	0	0	1	2	4	0
Air quality (dust)	0	1	0	1	6	41	2
Blasting	0	2	1	1	0	0	3
Traffic	0	0	0	0	0	0	1
Water	0	0	0	0	0	0	0
Other	3	0	0	0	0	2	1
Total	**3**	**2**	**1**	**3**	**8**	**47**	**7**

10.0 Independent Audit

An Independent Environmental Audit (IEA) was conducted within this reporting period on 29 September 2020 as per Condition 11 of DA 128-5-2005. This was the fourth IEA for the quarry.

An IEA Action Plan was created in response to this IEA and is attached in **Appendix 3.**

The next IEA is due in September 2023.

11.0 Incidents and non-compliances during the report period

Lynwood Quarry advised DPIE and EPA on 15 June 2020 of several non-compliances for environmental monitoring under the Development Approval 128-5-2005 and EPL 12939. This notification to the authorities outlined internal and external actions being taken by Lynwood to correct these non-compliances and prevent further environmental monitoring non-compliances occurring in the future. A summary of this notification is represented in **Table 35**.

Table 35: Summary of June 2020 Notification of Non-Compliance

Non-Compliance	Date	Explanation and Comments
Air Quality Monitoring Sampling events missed at HVAS 1 on 03/01/2020, 09/01/2020, and 15/01/2020. Sampling events missed at HVAS 2 on 03/01/2020 and 09/01/2020.	January 2020	The air quality monitoring contractor notified Lynwood of a software error in the monitoring equipment on 14/01/2020. Lynwood immediately contacted equipment provider of the issue. Software dates were reset on the 21/01/2020.
Air Quality Monitoring Sampling event was missed at HVAS 1 due to machine being impacted by dust/wind storm.	27/01/2020	Equipment providers notified immediately of machine damage. Machine serviced 27/02/2020. Lynwood has implemented a procedure to check all monitors immediately after significant weather events. See **Figure 6** for a photo of the weather event on 23/01/2020 which impacted HVAS 1.
Air Quality Criteria Exceedance PM_{10} result of 71 µg/m^3 at HVAS 2.	27/01/2020	23/01/2020 storm event (**Figure 6**) was a major contributor of this result, as evidenced by meteorological data in the local area. A significant amount of dust originated from a paddock to the west of the project site. A review into dust management procedures undertaken.
Air Quality Monitoring Software error impacted sample date and sample time. HVAS 1 reading of 75.7 µg/m^3. HVAS 2 reading of 95.7 µg/m^3.	03/02/2020	Civil earthworks operations on this date noted as a contributor to dust reading. Machines manually changed to reflect true date.

Non-Compliance	Date	Explanation and Comments
Air Quality Monitoring Depositional dust sample time exceeded.	February 2020	Sampling contractor of the time did not collect depositional dust samples within the timeframe. Sampling contractor changed to Ramboll at the end of February.
Surface Water Monitoring Surface water sampling time exceeded.	March 2020	Change over in environmental monitoring contractor in combination with miscommunications surrounding Covid-19 procedures and the short month of February led to the sample not being collected.

Figure 6: Photograph taken on site of weather conditions on 23/01/2020.

Lynwood Quarry has committed to continue to improve procedures around environmental monitoring, contractor communication, the INX system, and dust management.

12.0 Activities to be completed in the next report period

Lynwood Quarry proposes to undertake a range of activities during the 2021 report period related to continued quarrying operations and also related to completion of actions required as a result of the 2018 IEA. Actions proposed to be undertaken by Holcim at Lynwood Quarry during 2021 include:

- Complete implementation of the actions identified in the IEA Action Plan;
- Implementation of environmental management plans;
- Undertake nest box and fauna monitoring in accordance with the Lynwood Quarry Rehabilitation and Landscape Management Plan;
- Finalise the Development Approval for the construction and management of the Keeping Place;
- Continued extraction within the Granite Pit; and
- Continue works associated with construction of the visual amenity bund to the west of the Granite Pit.

13.0 References

Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1, The Guidelines.

Muller Acoustic Consulting, 2020a. Noise Monitoring Assessment. Lynwood Quarry, Marulan. Prepared for Holcim (Australia) Pty Ltd.

Muller Acoustic Consulting, 2020b. Noise Monitoring Assessment. Lynwood Quarry, Marulan. Prepared for Holcim (Australia) Pty Ltd.

Muller Acoustic Consulting, 2020c. Noise Monitoring Assessment. Lynwood Quarry, Marulan. Prepared for Holcim (Australia) Pty Ltd.

Muller Acoustic Consulting, 2020d. Noise Monitoring Assessment. Lynwood Quarry, Marulan. Prepared for Holcim (Australia) Pty Ltd.

SLR, 2020. Air Quality Management Plan. Prepared for Holcim (Australia) Pty Limited.

SLR, 2020. Blast Management Plan. Prepared for Holcim (Australia) Pty Limited.

SLR, 2020. Environmental management strategy. Prepared for Holcim (Australia) Pty Limited.

SLR, 2020. Noise Management Plan. Prepared for Holcim (Australia) Pty Limited.

Umwelt Pty Limited, 2019. Aboriginal Heritage management plan. Prepared for Holcim (Australia) Pty Limited.

Umwelt Pty Limited, 2013. Box gum woodland management plan. Prepared for Holcim (Australia) Pty Limited.

Umwelt Pty Limited, 2011. Construction traffic management plan. Prepared for Holcim (Australia) Pty Limited

Umwelt Pty Limited, 2015. Environmental Assessment – Lynwood Quarry Extraction Area modification (MOD 4). Prepared for Holcim (Australia) Pty Limited.

Umwelt Pty Limited, 2015. Noise Impact Assessment. Prepared for Holcim (Australia) Pty Limited.

Umwelt Pty Limited, 2018. Rehabilitation and Landscape management plan. Prepared for Holcim (Australia) Pty Limited.

APPENDIX 1
Noise Monitoring Reports

Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW
Quarter 1 Ending March 2020.

Prepared for: Holcim (Australia) Pty Ltd
February 2020
MAC180611-02RP7

Muller Acoustic Consulting

Document Information

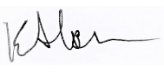
Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW

Quarter 1 Ending March 2020

Prepared for: Holcim (Australia) Pty Ltd

Prepared by: Muller Acoustic Consulting Pty Ltd
PO Box 262, Newcastle NSW 2300
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com

Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
MAC180611-02RP7	Final	17 February 2020	Kristian Allen		Rod Linnett	

CONTENTS

This page has been intentionally left blank

1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Lynwood Quarry (the 'quarry'), Marulan, NSW.

The monitoring has been conducted in accordance with the Lynwood Noise Management Plan (NMP) and in general accordance with the Noise Policy for Industry (NPI), at four representative monitoring locations. This assessment has been undertaken for the quarterly period ending March 2020, and forms part of the annual noise monitoring program to address conditions outlined in the Development Consent.

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Lynwood Quarry Noise Management Plan (NMP), 2016;
- Lynwood Quarry Environmental Protection Licence (EPL), 2013 (12939);
- Lynwood Quarry, Development Consent, 2005 (DA128-5-2005); and
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

This page has been intentionally left blank

2 Noise Criteria

The Lynwood Quarry Noise Management Plan (NMP), outlines the applicable noise criteria for residential receivers L1 – L16 surrounding the quarry, and are presented in **Table 1**.

Table 1 Noise Criteria[1]

Location	Day (7am to 6pm)	Evening (6pm to 10pm)	Night (10pm to 7am)	
	dB LAeq(15min)	dB LAeq(15min)	dB LAeq(15min)	dB LA1(1min)
L1	35	35	35	45
L2	35	35	35	45
L3	35	35	35	45
L4	35	37	35	46
L5	35	35	35	46
L6	35	37	36	46
L7	38	38	35	55
L8	39	38	36	55
L9	39	39	37	56
L10	42	42	40	53
L11	35	35	35[1]	47
L12	37	37	36	47
L13	40	38	37	47
L14	35	35	35	47
L15	35	35	35	47
L16	35	35	35	45

Note 1: Noise criteria adopted from the EPL.

This page has been intentionally left blank

3 Methodology

3.1 Locality

The quarry is located near Marulan, NSW approximately 4km west of the town centre. Receivers in the locality surrounding the quarry are primarily rural and residential. The quarry is surrounded by rural properties to the west, with the Hume Highway situated to the east and south of the site. Highway traffic is a dominant noise source in the area along with rural noise. The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan in **Figure 1** and presented in **Table 2.**

Table 2 Monitoring Location Addresses, dB $L_{Aeq(15min)}$

Location	NMP ID	Address	Criteria		
			Day	Evening	Night
N1	L1	1114 Carrick Road, Marulan	35	35	35
N2	L6	End of Maclura Drive, Marulan	35	37	36
N3	L11	Northern Boundary, 16038 Hume Highway, Marulan[1]	35	35	35[2]
N4	L12	Corner of Dorsett and Suffolk Road, Marulan	37	37	36

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 1: Intermediate noise monitoring point.

Note 2: Noise criteria adopted from the EPL.

3.2 Assessment Methodology

The attended noise measurements were conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and the Lynwood Quarry EPL. The measurements were carried out using a Svantek Type 1, 971 noise analyser on Tuesday 4 February 2020 and Thursday 6 February 2020. The acoustic instrumentation used carries current NATA calibration and complies with AS IEC 61672.1-2019- Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA.

Noise measurements were of 15-minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. Measurements were conducted at four locations (N1-N4) on Tuesday 4 February 2020 and Thursday 6 February 2020 to satisfy the requirements of the NMP.

Extraneous noise sources were excluded from the analysis to determine the $LA_{eq(15min)}$ quarry noise contribution for comparison against the relevant criteria. In the event of quarry attributed noise being above criteria, prevailing meteorological conditions for the monitoring period are sourced from the onsite meteorological station and analysed in accordance with Fact Sheet A4 of the NPI to determine the stability category present at the time of each attended measurement.

Where the quarry is inaudible, the contribution is estimated to be at least 10dBA below the ambient noise level.

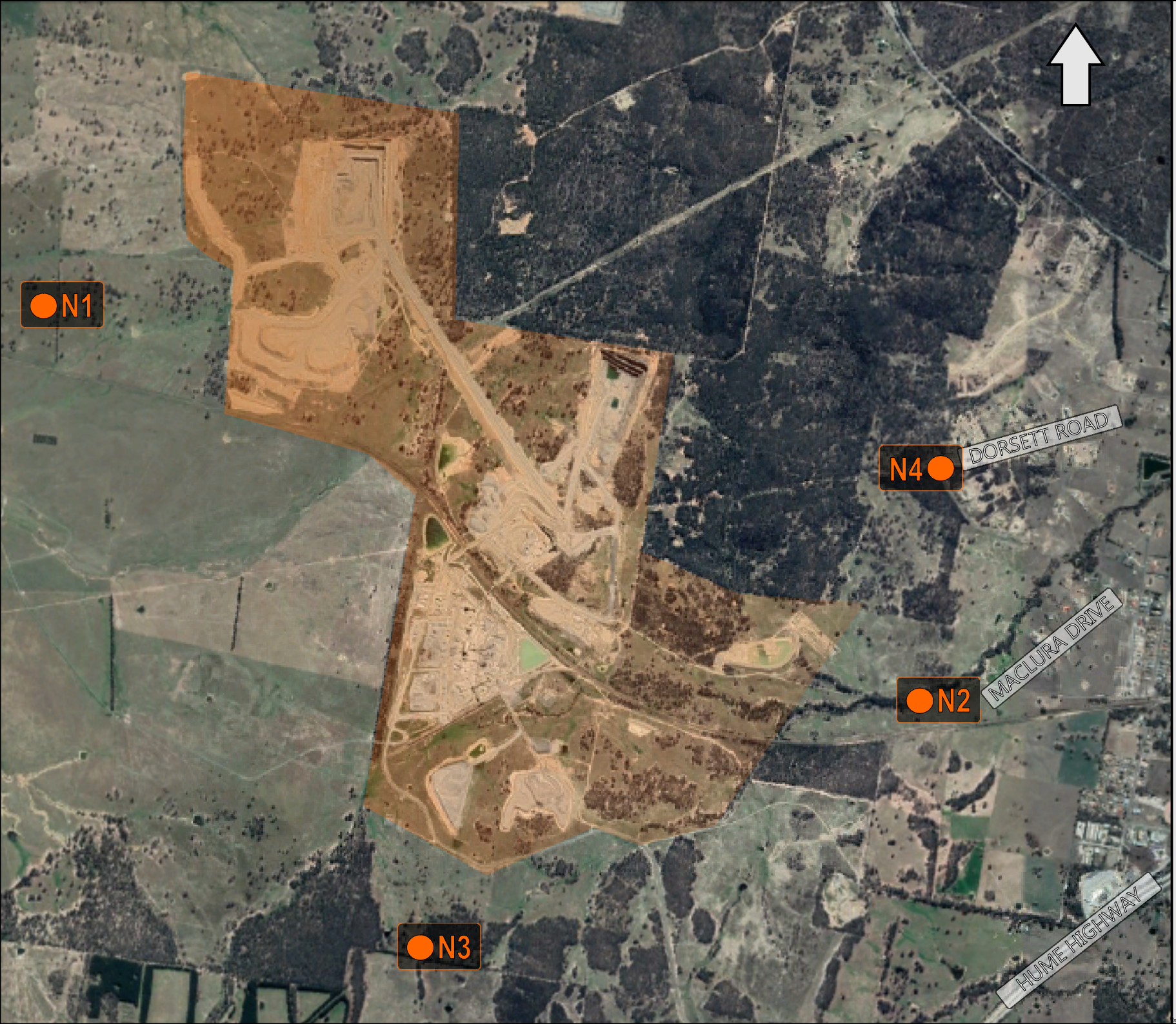


FIGURE 1

LOCALITY PLAN

REF: MAC180611-02

0 1000m

KEY

R1 RECEIVER LOCATION

SITE LOCATION

MAC
Muller Acoustic Consulting

Imagery Source : Google Earth

This page has been intentionally left blank

4 Results

4.1 Assessment Results - Location N1

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N1 for the NMA are presented in **Table 3**.

Table 3 Operator-Attended Noise Survey Results – Location N1

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
04/02/2020	19:27 (Evening)	53	41	37	WD: NE WS: 1.5m/s Rain: Nil	Wind 35-48 Distant Traffic <25 Birds 35-53 Holcim Vehicles/Alarms <30
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
06/02/2020	10:27 (Day)	71	47	37	WD: E WS: 1.5m/s Rain: Nil	Wind 40-55 Birds 37-45 Farm Vehicle 40-71 Holcim Vehicles <32
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<32

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.2 Assessment Results - Location N2

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N2 for the NMA are presented in **Table 4**.

Table 4 Operator-Attended Noise Survey Results – Location N2

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
04/02/2020	20:28 (Evening)	61	43	39	WD: E WS: 1.5m/s Rain: Nil	Wind 33-48 Distant Traffic 33-41 Train 38-61 Holcim Site Inaudible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
06/02/2020	09:05 (Day)	73	48	40	WD: SE WS: 1.0m/s Rain: Nil	Distant Traffic 34-42 Birds 40-62 Wind 35-38 Train 44-73 Aircraft 42-51 Holcim Site Inaudible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.3 Assessment Results - Location N3

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N3 for the NMA are presented in **Table 5**.

Table 5 Operator-Attended Noise Survey Results – Location N3

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
04/02/2020	21:07 (Evening)	54	42	37	WD: E WS: 1.5m/s Rain: Nil	Wind 32-47 Distant Traffic 32-44 Train 38-54 Holcim Vehicles/Alarms <30-32 Holcim Hum <30
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<32
06/02/2020	11:15 (Day)	57	41	38	WD: SE WS: 1.0m/s Rain: Nil	Birds 34-57 Distant Traffic 34-41 Trucks on Access Road 36-49 Holcim Loader <32-34 Holcim Vehicles/Alarms <34-39
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<35

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.4 Assessment Results - Location N4

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N4 for the NMA are presented in **Table 6**.

Table 6 Operator-Attended Noise Survey Results – Location N4

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
04/02/2020	20:04 (Evening)	70	43	37	WD: E WS: 1.5m/s Rain: Nil	Wind 34-48 Birds 34-61 Local Traffic 40-60 Operator 70 Holcim Site Inaudible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
06/02/2020	09:26 (Day)	55	39	35	WD: SE WS: 1.5m/s Rain: Nil	Birds 33-55 Aircraft 40-47 Wind 30-36 Holcim Site Inaudible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

5 Discussion

5.1 Discussion of Results - Location N1

Monitoring on Tuesday 4 February 2020 identified that quarry noise was just audible during the evening period with quarry noise contributions estimated to be below 30dBA. Monitoring on Thursday 6 February 2020 identified that quarry noise was just audible during the day period with quarry noise contributions estimated to be below 32dBA. Therefore, quarry noise emissions satisfy the relevant noise criteria for both periods. Quarry noise sources audible during the survey included Holcim site vehicles and vehicle reversing alarms. Extraneous noise sources included wind in trees, birds, distant traffic and farm vehicles.

5.2 Discussion of Results - Location N2

Monitoring on Tuesday 4 February 2020 and Thursday 6 February 2020 identified that quarry noise was inaudible during both evening and daytime surveys with contributions estimated to be below 30dBA therefore satisfying the relevant noise criteria for both measurements. Extraneous noise sources measured included wind in trees, trains, distant traffic, birds, and aircraft.

5.3 Discussion of Results - Location N3

Monitoring on Tuesday 4 February 2020 identified that quarry noise was audible during the evening period with quarry noise contributions estimated to be below 32dBA. Monitoring on Thursday 6 February 2020 identified that quarry noise was audible during the day period with quarry noise contributions estimated to be below 35dBA. Therefore, quarry noise emissions satisfy the relevant noise criteria for both periods. Quarry noise sources audible during the survey included Holcim site vehicles, vehicle reverse alarms and quarry hum. Extraneous noise sources included wind in trees, trains, birds and distant traffic.

5.4 Discussion of Results - Location N4

Quarry noise was inaudible during the measurements conducted on Tuesday 4 February 2020 and Thursday 6 February 2020. Quarry noise emissions were estimated to be below 30dBA for both evening and daytime surveys, therefore satisfying relevant noise criteria for both measurements. Extraneous noise sources included wind in trees, aircraft, operator noise, birds and local traffic.

This page has been intentionally left blank

6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) for Holcim (Australia) Pty Ltd at the Lynwood Quarry, Marulan, NSW. The assessment was completed to assess the quarry's compliance with the relevant noise criteria during Quarter 1, ending March 2020.

Attended noise monitoring was undertaken on Tuesday 4 February 2020 and Thursday 6 February 2020 at four representative monitoring locations. The assessment has identified that noise emissions generated by Lynwood Quarry were occasionally audible, however quarry noise emissions were below the relevant noise criteria, satisfying the applicable noise criteria throughout the survey period.

This page has been intentionally left blank

Appendix A - Glossary of Terms

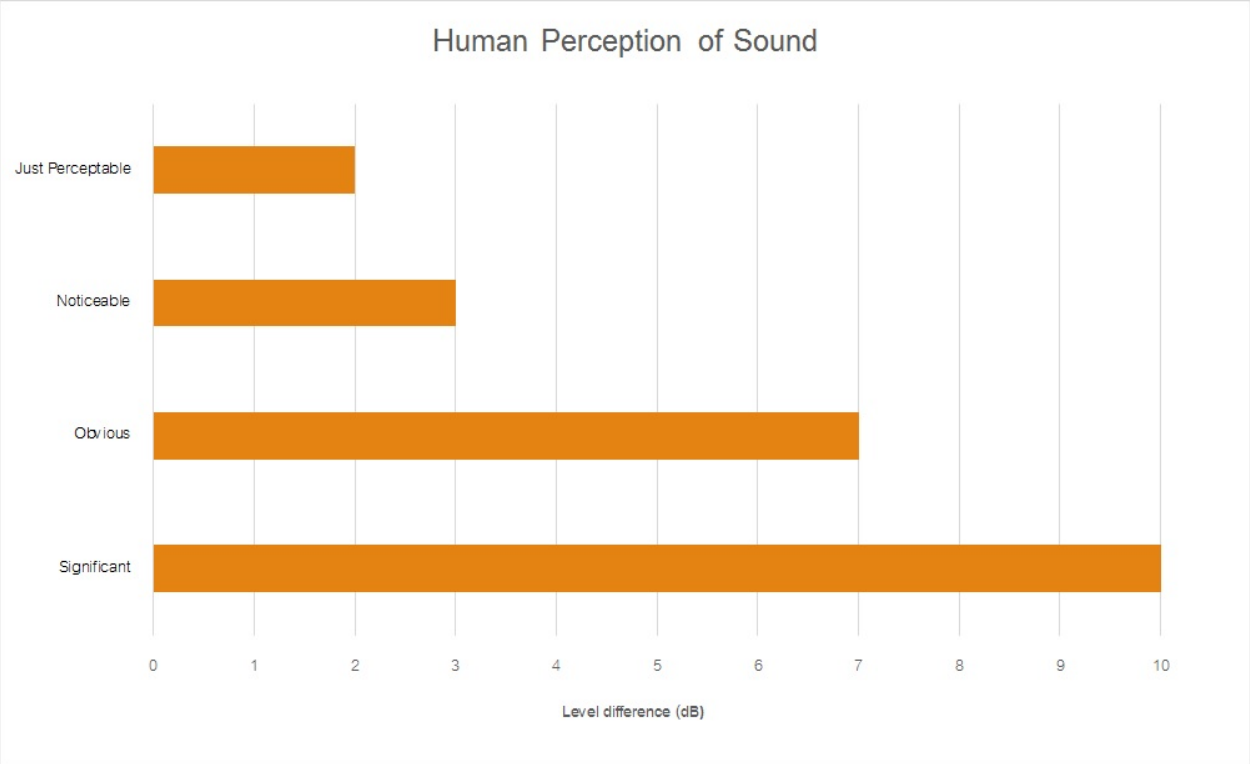
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : = 10.log10 (W/Wo) Where : W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



Muller Acoustic Consulting Pty Ltd
PO Box 262, Newcastle NSW 2300
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com

MAC
Muller Acoustic Consulting

Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW
Quarter 2 Ending June 2020.

Prepared for: Holcim (Australia) Pty Ltd
April 2020
MAC180611-02RP8

Muller Acoustic Consulting

Document Information

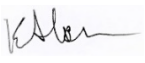
Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW

Quarter 2 Ending June 2020

Prepared for: Holcim (Australia) Pty Ltd

Prepared by: Muller Acoustic Consulting Pty Ltd
PO Box 262, Newcastle NSW 2300
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com

Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
MAC180611-02RP8	Final	29 April 2020	Kristian Allen		Rod Linnett	

CONTENTS

This page has been intentionally left blank

1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Lynwood Quarry (the 'quarry'), Marulan, NSW.

The monitoring has been conducted in accordance with the Lynwood Noise Management Plan (NMP) and in general accordance with the Noise Policy for Industry (NPI), at four representative monitoring locations. This assessment has been undertaken for the quarterly period ending June 2020, and forms part of the annual noise monitoring program to address conditions outlined in the Development Consent.

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Lynwood Quarry Noise Management Plan (NMP), 2016;
- Lynwood Quarry Environmental Protection Licence (EPL), 2013 (12939);
- Lynwood Quarry, Development Consent, 2005 (DA128-5-2005); and
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

This page has been intentionally left blank

2 Noise Criteria

The Lynwood Quarry Noise Management Plan (NMP), outlines the applicable noise criteria for residential receivers L1 – L16 surrounding the quarry, and are presented in **Table 1**.

Table 1 Noise Criteria[1]

Location	Day (7am to 6pm)	Evening (6pm to 10pm)	Night (10pm to 7am)	
	dB LAeq(15min)	dB LAeq(15min)	dB LAeq(15min)	dB LA1(1min)
L1	35	35	35	45
L2	35	35	35	45
L3	35	35	35	45
L4	35	37	35	46
L5	35	35	35	46
L6	35	37	36	46
L7	38	38	35	55
L8	39	38	36	55
L9	39	39	37	56
L10	42	42	40	53
L11	35	35	35[1]	47
L12	37	37	36	47
L13	40	38	37	47
L14	35	35	35	47
L15	35	35	35	47
L16	35	35	35	45

Note 1: Noise criteria adopted from the EPL.

This page has been intentionally left blank

3 Methodology

3.1 Locality

The quarry is located near Marulan, NSW approximately 4km west of the town centre. Receivers in the locality surrounding the quarry are primarily rural and residential. The quarry is surrounded by rural properties to the west, with the Hume Highway situated to the east and south of the site. Highway traffic is a dominant noise source in the area along with rural noise. The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan in **Figure 1** and presented in **Table 2.**

Table 2 Monitoring Location Addresses

Location	NMP ID	Address	Criteria dB $LA_{eq(15min)}$		
			Day	Evening	Night
N1	L1	1114 Carrick Road, Marulan	35	35	35
N2	L6	End of Maclura Drive, Marulan	35	37	36
N3	L11	Northern Boundary, 16038 Hume Highway, Marulan[1]	35	35	35[2]
N4	L12	Corner of Dorsett and Suffolk Road, Marulan	37	37	36

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 1: Intermediate noise monitoring point.

Note 2: Noise criteria adopted from the EPL.

3.2 Assessment Methodology

The attended noise measurements were conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and the Lynwood Quarry EPL. The measurements were carried out using a Svantek Type 1, 971 noise analyser on Tuesday 21 April 2020 and Wednesday 22 April 2020. The acoustic instrumentation used carries current NATA calibration and complies with AS IEC 61672.1-2019- Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA.

Noise measurements were of 15-minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. Measurements were conducted at four locations (N1-N4) on Tuesday 21 April 2020 and Wednesday 22 April 2020 to satisfy the requirements of the NMP.

Extraneous noise sources were excluded from the analysis to determine the $LA_{eq(15min)}$ quarry noise contribution for comparison against the relevant criteria. In the event of quarry attributed noise being above criteria, prevailing meteorological conditions for the monitoring period are sourced from the onsite meteorological station and analysed in accordance with Fact Sheet A4 of the NPI to determine the stability category present at the time of each attended measurement.

Where the quarry is inaudible, the contribution is estimated to be at least 10dBA below the ambient noise level.

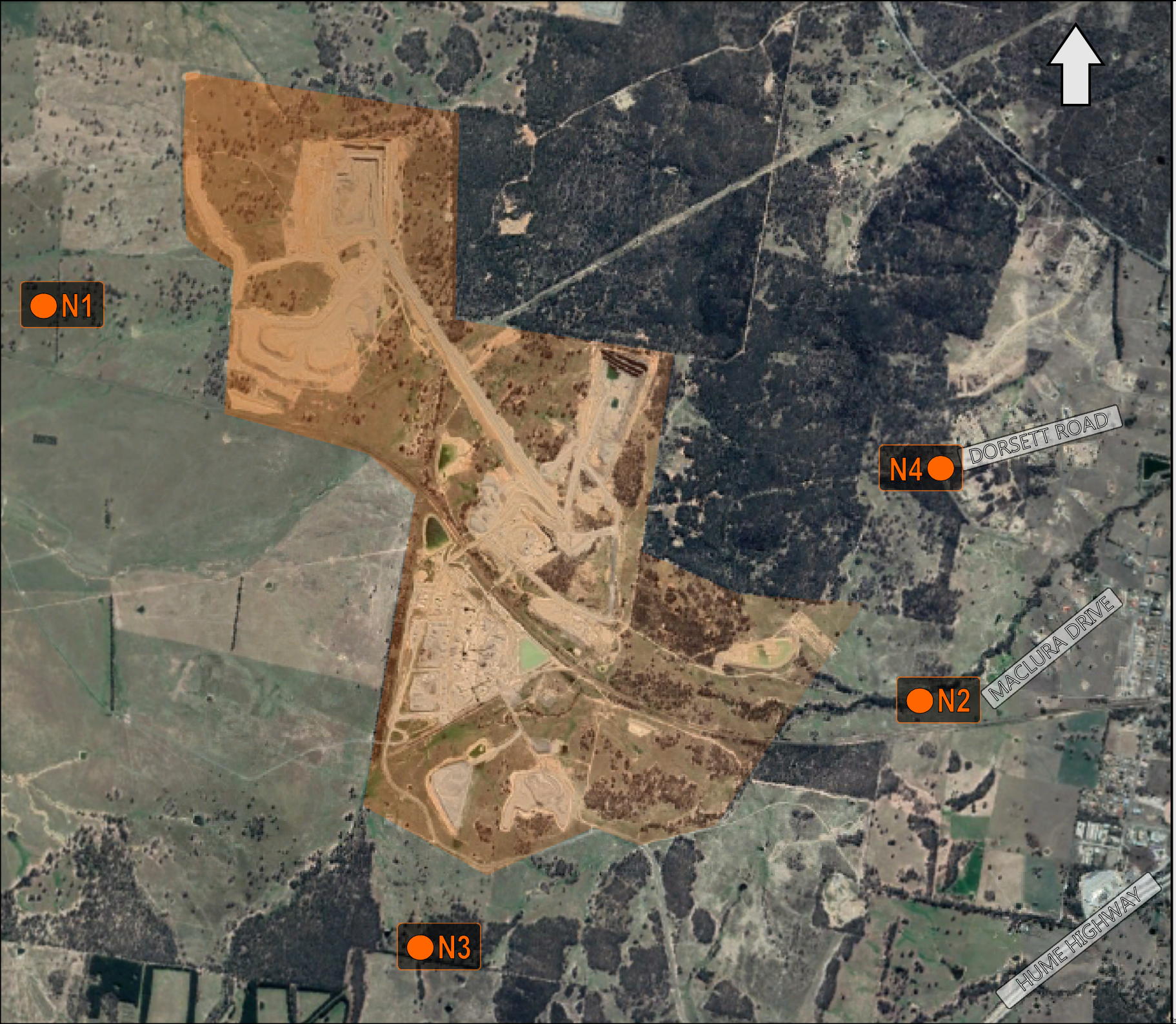


FIGURE 1

LOCALITY PLAN

REF: MAC180611-02

0 1000m

KEY

R1 RECEIVER LOCATION

SITE LOCATION

MAC
Muller Acoustic Consulting

Imagery Source : Google Earth

This page has been intentionally left blank

4 Results

4.1 Assessment Results - Location N1

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location N1 for the NMA are presented in **Table 3**.

Table 3 Operator-Attended Noise Survey Results – Location N1

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
21/04/2020	15:06 (Day)	74	41	32	WD: W WS: 1.5m/s Rain: Nil	Birds 32-56 Wind to 51 Operator/Car 74 Holcim Site Inaudible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
22/04/2020	12:39 (Day)	74	56	37	WD: W WS: 2.5m/s Rain: Nil	Wind 33-56 Birds 40-45 Train 37-74 Holcim Site Inaudible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.2 Assessment Results - Location N2

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location N2 for the NMA are presented in **Table 4**.

Table 4 Operator-Attended Noise Survey Results – Location N2

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
21/04/2020	13:59 (Day)	56	39	36	WD: SW WS: 1.5m/s Rain: Nil	Wind 35-56 Birds 30-38 Holcim Vehicles <30
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
22/04/2020	11:37 (Day)	69	47	41	WD: SW WS: 2.5m/s Rain: Nil	Wind 38-69 Birds 35-40 Holcim Vehicles <30
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.3 Assessment Results - Location N3

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location N3 for the NMA are presented in **Table 5**.

Table 5 Operator-Attended Noise Survey Results – Location N3

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
21/04/2020	13:20 (Day)	54	41	36	WD: SW WS: 1.5m/s Rain: Nil	Wind 33-54 Birds 30-35 Distant Traffic 30-35 Holcim Vehicles 30-38 Holcim Site Hum <30
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<35
22/04/2020	10:45 (Day)	68	45	37	WD: SW WS: 2.5m/s Rain: Nil	Wind 32-68 Distant Traffic 32-36 Birds 32-41 Holcim Vehicles <34-38 Holcim Site Hum 30-33
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<35

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.4 Assessment Results - Location N4

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location N4 for the NMA are presented in **Table 6**.

Table 6 Operator-Attended Noise Survey Results – Location N4

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
21/04/2020	14:23 (Day)	68	46	36	WD: SW WS: 2.0m/s Rain: Nil	Wind 33-55 Local Traffic 36-68 Birds 30-42 Construction Noise <30-32 Holcim Vehicles <30 Holcim Reverse Alarms <30
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
22/04/2020	12:00 (Day)	72	53	43	WD: SW WS: 3.0m/s Rain: Nil	Wind 40-72 Local Traffic 41-64 Birds 37-68 Construction Noise <35 Holcim Site Inaudible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<35

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

This page has been intentionally left blank

5 Discussion

5.1 Discussion of Results - Location N1

Monitoring on Tuesday 21 April 2020 and Wednesday 22 April 2020 identified that quarry noise was inaudible during both daytime measurements with contributions estimated to be below 30dBA therefore satisfying the relevant noise criteria for both measurements. Extraneous noise sources included wind in trees, birds, trains and operator noise.

5.2 Discussion of Results - Location N2

Monitoring on Tuesday 21 April 2020 and Wednesday 22 April 2020 identified quarry noise was just audible during both daytime measurements with contributions estimated to be below 30dBA, therefore satisfying the relevant noise criteria for both measurements. Quarry noise sources included vehicle movements. Extraneous noise sources measured included wind in trees and birds.

5.3 Discussion of Results - Location N3

Monitoring on Tuesday 21 April 2020 and Wednesday 22 April 2020 identified that quarry noise was audible during both daytime measurements with quarry noise contributions estimated to be below 35dBA. Therefore, quarry noise emissions satisfy the relevant noise criteria for both measurements. Quarry noise sources audible during the survey included vehicle movements and quarry hum. Extraneous noise sources included wind in trees, birds and distant traffic.

5.4 Discussion of Results - Location N4

Monitoring on Tuesday 21 April 2020 identified that quarry noise was just audible during the daytime measurements with quarry noise contributions estimated to be below 30dBA. Monitoring on Wednesday 22 April 2020 identified that quarry noise was inaudible during the day period with quarry noise contributions estimated to be below 35dBA, therefore, satisfying relevant noise criteria for both measurements. Quarry noise sources audible during the survey included vehicles movements and vehicle reverse alarms. Extraneous noise sources included wind in trees, birds, construction noise and local traffic.

This page has been intentionally left blank

6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) for Holcim (Australia) Pty Ltd at the Lynwood Quarry, Marulan, NSW. The assessment was completed to assess the quarry's compliance with the relevant noise criteria during Quarter 2, ending June 2020.

Attended noise monitoring was undertaken on Tuesday 21 April 2020 and Wednesday 22 April 2020 at four representative monitoring locations. The assessment has identified that noise emissions generated by Lynwood Quarry were occasionally audible, however quarry noise emissions were below the relevant noise criteria, satisfying the applicable noise criteria throughout the survey period.

This page has been intentionally left blank

Appendix A - Glossary of Terms

Table A1 provides a number of technical terms have been used in this report.

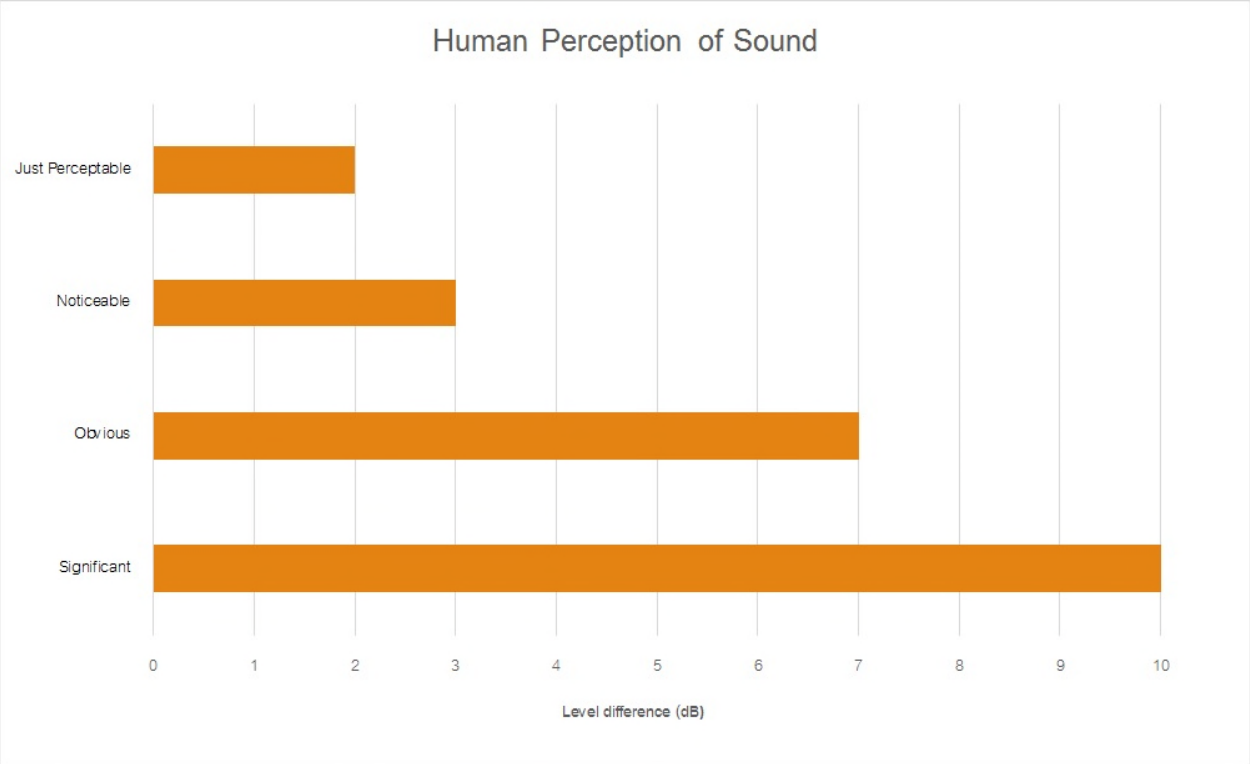
Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : = 10.log10 (W/Wo) Where : W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA

Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



Muller Acoustic Consulting Pty Ltd
PO Box 262, Newcastle NSW 2300
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com

MAC
Muller Acoustic Consulting

Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW
Quarter 3 Ending September 2020.

Prepared for: Holcim (Australia) Pty Ltd
September 2020
MAC180611-02RP9

Muller Acoustic Consulting

Document Information

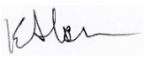
Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW

Quarter 3 Ending September 2020

Prepared for: Holcim (Australia) Pty Ltd

Prepared by: Muller Acoustic Consulting Pty Ltd
PO Box 262, Newcastle NSW 2300
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com

Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
MAC180611-02RP9	Final	24 September 2020	Kristian Allen		Rod Linnett	

CONTENTS

This page has been intentionally left blank

1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Lynwood Quarry (the 'quarry'), Marulan, NSW.

The monitoring has been conducted in accordance with the Lynwood Noise Management Plan (NMP) and in general accordance with the Noise Policy for Industry (NPI), at four representative monitoring locations. This assessment has been undertaken for the quarterly period ending September 2020, and forms part of the annual noise monitoring program to address conditions outlined in the Development Consent.

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Lynwood Quarry Noise Management Plan (NMP), 2016;
- Lynwood Quarry Environmental Protection Licence (EPL), 2013 (12939);
- Lynwood Quarry, Development Consent, 2005 (DA128-5-2005); and
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

This page has been intentionally left blank

2 Noise Criteria

The Lynwood Quarry Noise Management Plan (NMP), outlines the applicable noise criteria for residential receivers L1 – L16 surrounding the quarry, and are presented in **Table 1**.

Table 1 Noise Criteria[1]

Location	Day (7am to 6pm)	Evening (6pm to 10pm)	Night (10pm to 7am)	
	dB LAeq(15min)	dB LAeq(15min)	dB LAeq(15min)	dB LA1(1min)
L1	35	35	35	45
L2	35	35	35	45
L3	35	35	35	45
L4	35	37	35	46
L5	35	35	35	46
L6	35	37	36	46
L7	38	38	35	55
L8	39	38	36	55
L9	39	39	37	56
L10	42	42	40	53
L11	35	35	35[1]	47
L12	37	37	36	47
L13	40	38	37	47
L14	35	35	35	47
L15	35	35	35	47
L16	35	35	35	45

Note 1: Noise criteria adopted from the EPL.

This page has been intentionally left blank

3 Methodology

3.1 Locality

The quarry is located near Marulan, NSW approximately 4km west of the town centre. Receivers in the locality surrounding the quarry are primarily rural and residential. The quarry is surrounded by rural properties to the west, with the Hume Highway situated to the east and south of the site. Highway traffic is a dominant noise source in the area along with rural noise. The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan in **Figure 1** and presented in **Table 2.**

Table 2 Monitoring Location Addresses

NMP ID	EPL ID	Address	Criteria dB $LA_{eq(15min)}$		
			Day	Evening	Night
N1	L1	1114 Carrick Road, Marulan	35	35	35
N2	L6	End of Maclura Drive, Marulan	35	37	36
N3	L11	Northern Boundary, 16038 Hume Highway, Marulan[1]	35	35	35[2]
N4	L12	Corner of Dorsett and Suffolk Road, Marulan	37	37	36

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 1: Intermediate noise monitoring point.

Note 2: Noise criteria adopted from the EPL.

3.2 Assessment Methodology

The attended noise measurements were conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and the Lynwood Quarry EPL. The measurements were carried out using a Svantek Type 1, 971 noise analyser on Wednesday 16 September 2020 and Thursday 17 September 2020. The acoustic instrumentation used carries current NATA calibration and complies with AS IEC 61672.1-2019- Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA.

Noise measurements were of 15-minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. Measurements were conducted at four locations (N1-N4) on Wednesday 16 September 2020 and Thursday 17 September 2020 to satisfy the requirements of the NMP.

Extraneous noise sources were excluded from the analysis to determine the $LA_{eq(15min)}$ quarry noise contribution for comparison against the relevant criteria. In the event of quarry attributed noise being above criteria, prevailing meteorological conditions for the monitoring period are sourced from the onsite meteorological station and analysed in accordance with Fact Sheet A4 of the NPI to determine the stability category present at the time of each attended measurement.

Where the quarry is inaudible, the contribution is estimated to be at least 10dBA below the ambient noise level.

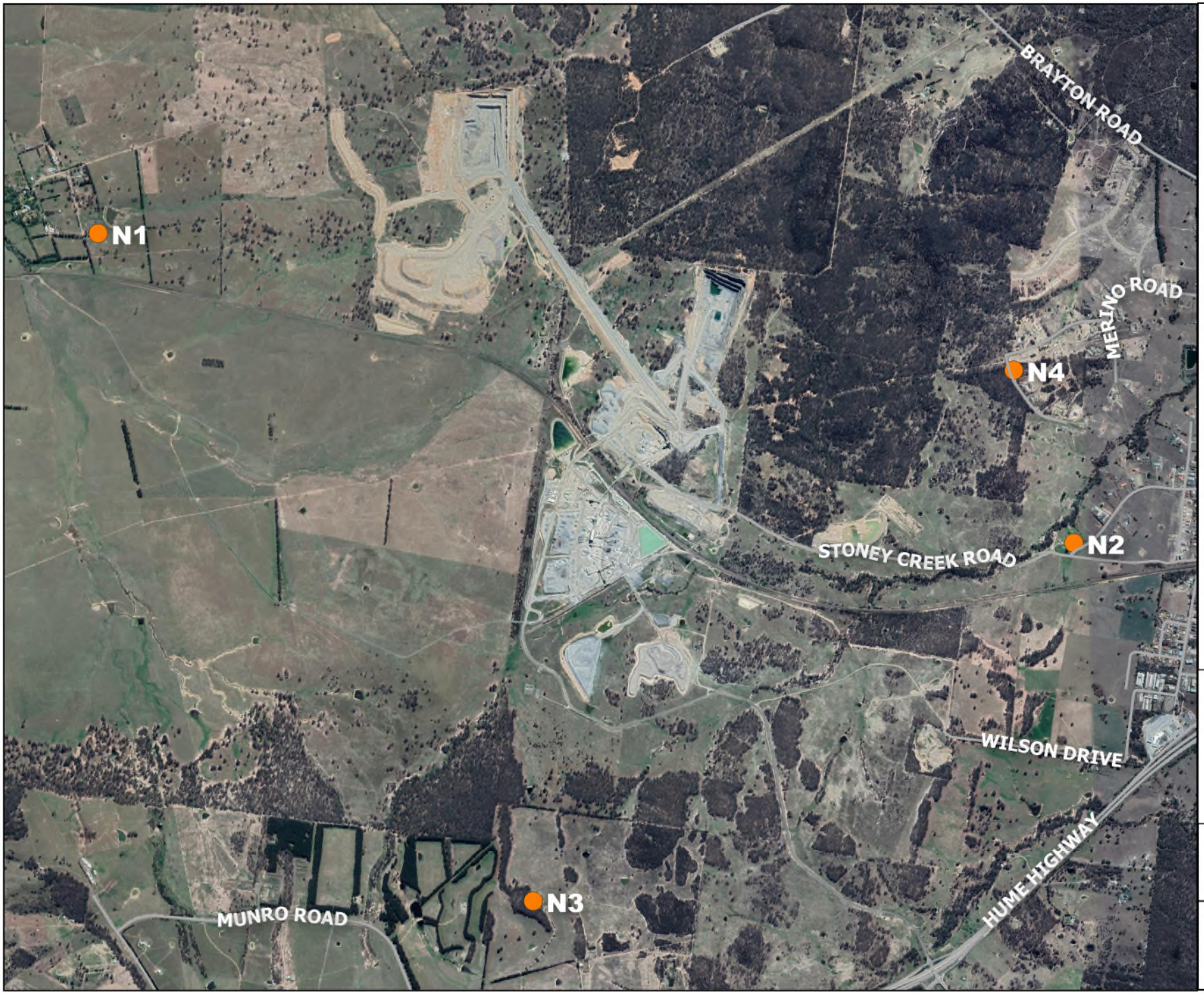


FIGURE 1

Site Locality

MAC180611-02

Holcim Lynwood Quarry

KEY

Noise Monitoring Locations

0 200 400 600 800 1000 m

N

MAC
Muller Acoustic Consulting

This page has been intentionally left blank

4 Results

4.1 Assessment Results - Location N1

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location N1 for the NMA are presented in **Table 3**.

Table 3 Operator-Attended Noise Survey Results – Location N1

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
16/09/2020	14:31 (Day)	68	50	37	WD: NW WS: 1.5m/s Rain: Nil	Wind 37-49 Livestock 34-38 Dogs 34-41 Birds 34-56 Train 42-68 Quarry Not Audible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
18/09/2020	00:03 (Night)	55	46	40	WD: SE WS: 1.0m/s Rain: Nil	Insects 37-55 Distant Traffic <34-37 Livestock <34-37 Quarry Not Audible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<35

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.2 Assessment Results - Location N2

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location N2 for the NMA are presented in **Table 4**.

Table 4 Operator-Attended Noise Survey Results – Location N2

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
16/09/2020	13:24 (Day)	59	39	36	WD: NW WS: 1.5m/s Rain: Nil	Birds 37-59 Wind <30-46 Distant Traffic <34-38 Quarry Noise <30 (Infrequent 1-2 second durations)
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
17/09/2020	22:57 (Night)	74	55	42	WD: SE WS: 1.0m/s Rain: Nil	Distant Traffic 38-49 Train 40-74 Insects <40 Quarry Not Audible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<35

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.3 Assessment Results - Location N3

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location N3 for the NMA are presented in **Table 5**.

Table 5 Operator-Attended Noise Survey Results – Location N3

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
16/09/2020	12:33 (Day)	60	46	42	WD: NW WS: 2.5m/s Rain: Nil	Wind 38-51 Operator 60 Birds 35-49 Distant Traffic <38 Quarry Haul Trucks <35 (<5 minute total duration)
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<35
17/09/2020	22:13 (Night)	48	42	40	WD: SE WS: 1.0m/s Rain: Nil	Insects 35-41 Distant Traffic <35-45 Wind <35-43 Operator 48 Quarry Vehicles <35 (<5 minute total duration) Quarry Reverse Alarms <35 (Infrequent <5 second durations)
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<35

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.4 Assessment Results - Location N4

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location N4 for the NMA are presented in **Table 6**.

Table 6 Operator-Attended Noise Survey Results – Location N4

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
16/09/2020	13:49 (Day)	57	45	36	WD: NW WS: 2.0m/s Rain: Nil	Wind 32-57 Construction Works <30 Birds <33-38 Quarry Not Audible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
17/09/2020	23:20 (Night)	48	38	34	WD: SE WS: 1.0m/s Rain: Nil	Distant Traffic 36-45 Operator 48 Insects <27 Quarry Not Audible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

5 Discussion

5.1 Discussion of Results - Location N1

Monitoring on Wednesday 16 September 2020 and Thursday 17 September 2020 identified that quarry noise was inaudible during both daytime and night time measurements, therefore quarry noise contributions were estimated to satisfy the relevant daytime and night time noise limits. Extraneous noise sources included wind in trees, birds, trains, insects, dogs barking, distant traffic and livestock.

5.2 Discussion of Results - Location N2

Monitoring on Wednesday 16 September 2020 identified quarry noise was just audible during daytime measurements and monitoring on and Thursday 17 September 2020 identified quarry noise was inaudible during night time measurements with quarry noise contributions estimated to satisfy the relevant daytime and night time noise limits. Quarry noise sources included machine noise. Extraneous noise sources measured included wind in trees, distant traffic, trains, insects and birds.

5.3 Discussion of Results - Location N3

Monitoring on Wednesday 16 September 2020 and Thursday 17 September 2020 identified that quarry noise was just audible during both daytime and night time measurements with quarry noise contributions estimated to satisfy the relevant daytime and night time noise limits. Quarry noise sources audible during the survey included haul trucks, vehicle and loader movements and reverse alarms. Extraneous noise sources included wind in trees, operator noise, birds, insects and distant traffic.

5.4 Discussion of Results - Location N4

Monitoring on Wednesday 16 September 2020 and Thursday 17 September 2020 identified that quarry noise was inaudible during both daytime and night time measurements, therefore quarry noise contributions were estimated to satisfy the relevant daytime and night time noise limits. Extraneous noise sources included wind in trees, birds, construction noise, insects, distant traffic and operator noise.

This page has been intentionally left blank

6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) for Holcim (Australia) Pty Ltd at the Lynwood Quarry, Marulan, NSW. The assessment was completed to assess the quarry's compliance with the relevant noise criteria during Quarter 3, ending September 2020.

Attended noise monitoring was undertaken on Wednesday 16 September 2020 and Thursday 17 September 2020 at four representative monitoring locations. The assessment has identified that noise emissions generated by Lynwood Quarry were occasionally audible, however quarry noise emissions were below the relevant noise criteria, satisfying the applicable noise criteria throughout the survey period.

This page has been intentionally left blank

Appendix A - Glossary of Terms

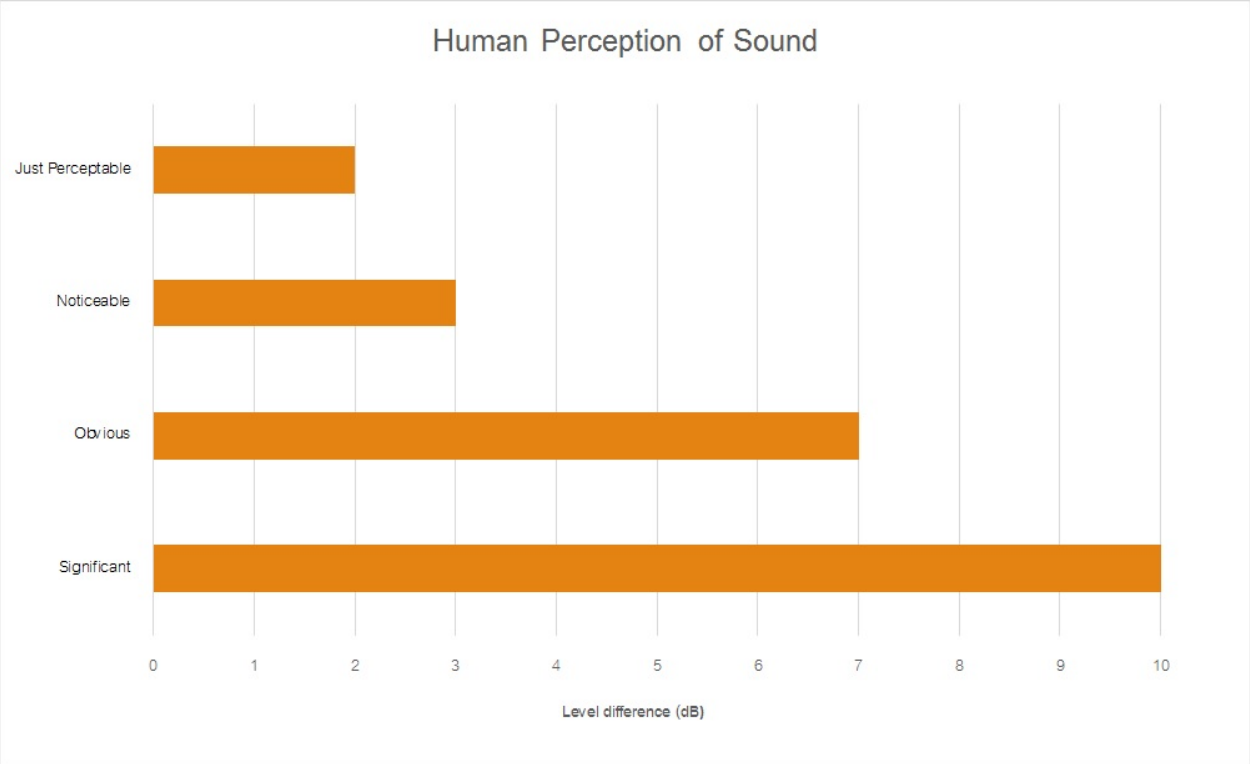
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : = 10.log10 (W/Wo) Where : W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



Muller Acoustic Consulting Pty Ltd
PO Box 262, Newcastle NSW 2300
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com

MAC
Muller Acoustic Consulting

Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW
Quarter 4 Ending December 2020.

Prepared for: Holcim (Australia) Pty Ltd
November 2020
MAC180611-02RP10

Muller Acoustic Consulting

Document Information

Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW

Quarter 4 Ending December 2020

Prepared for: Holcim (Australia) Pty Ltd

Prepared by: Muller Acoustic Consulting Pty Ltd
PO Box 262, Newcastle NSW 2300
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com

Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
MAC180611-02RP10	Final	17 November 2020	Nicholas Shipman		Rod Linnett	

CONTENTS

This page has been intentionally left blank

1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Lynwood Quarry (the 'quarry'), Marulan, NSW.

The monitoring has been conducted in accordance with the Lynwood Noise Management Plan (NMP) and in general accordance with the Noise Policy for Industry (NPI), at four representative monitoring locations. This assessment has been undertaken for the quarterly period ending December 2020, and forms part of the annual noise monitoring program to address conditions outlined in the Development Consent.

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Lynwood Quarry Noise Management Plan (NMP), 2016;
- Lynwood Quarry Environmental Protection Licence (EPL), 2013 (12939);
- Lynwood Quarry, Development Consent, 2005 (DA128-5-2005); and
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

This page has been intentionally left blank

2 Noise Criteria

The Lynwood Quarry Noise Management Plan (NMP), outlines the applicable noise criteria for residential receivers L1 – L16 surrounding the quarry, and are presented in **Table 1**.

Table 1 Noise Criteria[1]

Location	Day (7am to 6pm)	Evening (6pm to 10pm)	Night (10pm to 7am)	
	dB LAeq(15min)	dB LAeq(15min)	dB LAeq(15min)	dB LA1(1min)
L1	35	35	35	45
L2	35	35	35	45
L3	35	35	35	45
L4	35	37	35	46
L5	35	35	35	46
L6	35	37	36	46
L7	38	38	35	55
L8	39	38	36	55
L9	39	39	37	56
L10	42	42	40	53
L11	35	35	35[1]	47
L12	37	37	36	47
L13	40	38	37	47
L14	35	35	35	47
L15	35	35	35	47
L16	35	35	35	45

Note 1: Noise criteria adopted from the EPL.

This page has been intentionally left blank

3 Methodology

3.1 Locality

The quarry is located near Marulan, NSW approximately 4km west of the town centre. Receivers in the locality surrounding the quarry are primarily rural and residential. The quarry is surrounded by rural properties to the west, with the Hume Highway situated to the east and south of the site. Highway traffic is a dominant noise source in the area along with rural noise. The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan in **Figure 1** and presented in **Table 2.**

Table 2 Monitoring Location Addresses

NMP ID	EPL ID	Address	Criteria dB $LA_{eq(15min)}$		
			Day	Evening	Night
N1	L1	1114 Carrick Road, Marulan	35	35	35
N2	L6	End of Maclura Drive, Marulan	35	37	36
N3	L11	Northern Boundary, 16038 Hume Highway, Marulan[1]	35	35	35[2]
N4	L12	Corner of Dorsett and Suffolk Road, Marulan	37	37	36

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 1: Intermediate noise monitoring point.

Note 2: Noise criteria adopted from the EPL.

3.2 Assessment Methodology

The attended noise measurements were conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and the Lynwood Quarry EPL. The measurements were carried out using a Svantek Type 1, 971 noise analyser on Monday 9 November 2020 and Wednesday 11 November 2020. The acoustic instrumentation used carries current NATA calibration and complies with AS IEC 61672.1-2019- Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA.

Noise measurements were of 15-minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. Measurements were conducted at four locations (N1-N4) on Monday 9 November 2020 and Wednesday 11 November 2020 to satisfy the requirements of the NMP.

Extraneous noise sources were excluded from the analysis to determine the $LA_{eq(15min)}$ quarry noise contribution for comparison against the relevant criteria. In the event of quarry attributed noise being above criteria, prevailing meteorological conditions for the monitoring period are sourced from the onsite meteorological station and analysed in accordance with Fact Sheet D of the NPI to determine the stability category present at the time of each attended measurement.

Where the quarry is inaudible, the contribution is estimated to be at least 10dBA below the ambient noise level.

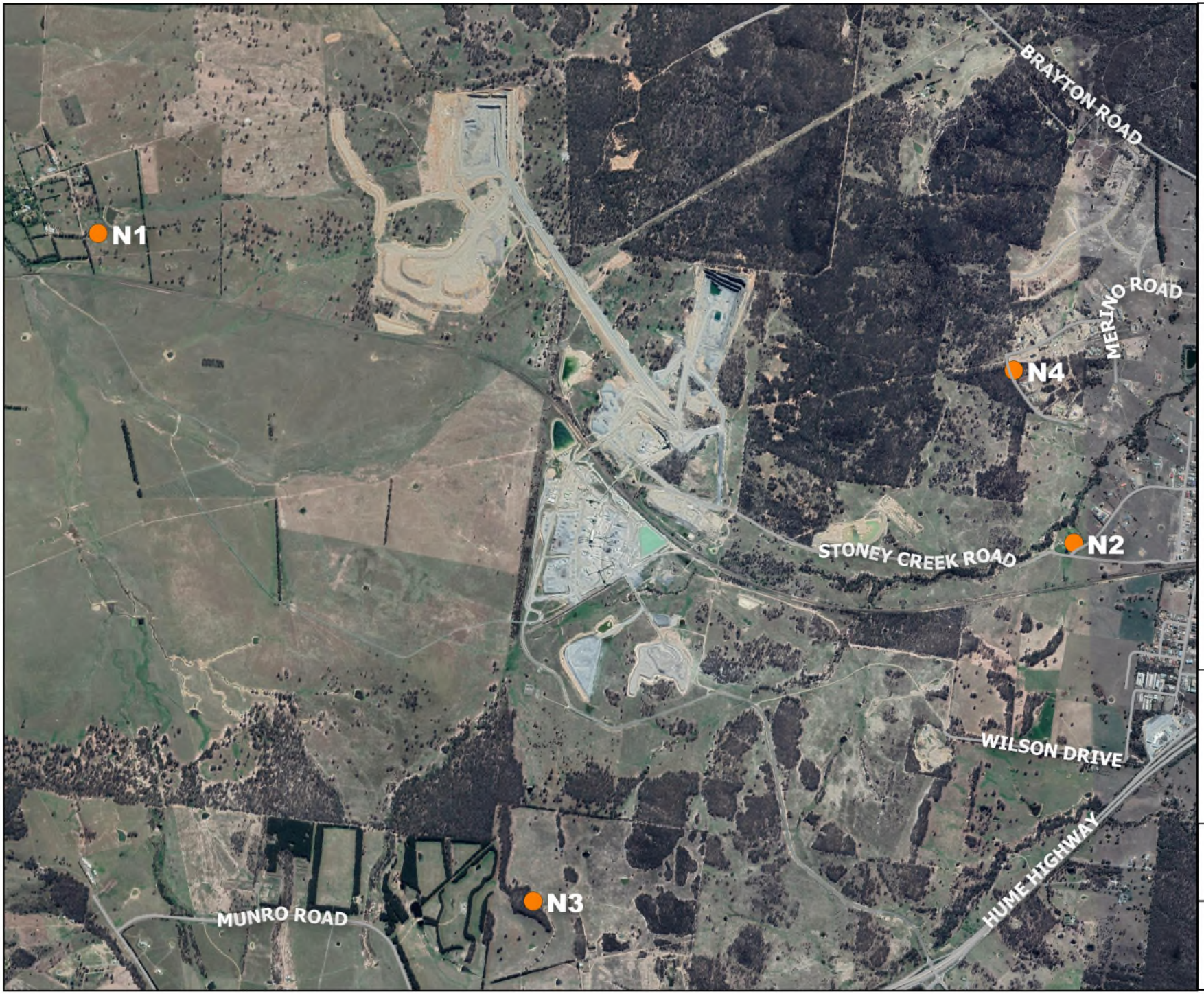


FIGURE 1

Site Locality

MAC180611-02

Holcim Lynwood Quarry

KEY

Noise Monitoring Locations

0 200 400 600 800 1000 m

N

MAC
Muller Acoustic Consulting

This page has been intentionally left blank

4 Results

4.1 Assessment Results - Location N1

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location N1 for the NMA are presented in **Table 3**.

Table 3 Operator-Attended Noise Survey Results – Location N1

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
09/11/2020	13:56 (Day)	64	46	34	WD: NE WS: 0.5m/s Rain: Nil	Birds 31-44 Train 31-64 Quarry Processing Plant <33
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<33
11/11/2020	08:21 (Day)	64	42	32	WD: NE WS: 0.1m/s Rain: Nil	Livestock 29-54 Birds 29-56 Aircraft 29-64 Quarry Not Audible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.2 Assessment Results - Location N2

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location N2 for the NMA are presented in **Table 4**.

Table 4 Operator-Attended Noise Survey Results – Location N2

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
09/11/2020	12:59 (Day)	73	46	36	WD: E WS: 0.4m/s Rain: Nil	Birds 34-42 Traffic 34-41 Train 34-73 Insects <34 Dog bark <34 Quarry Not Audible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
11/11/2020	09:16 (Day)	65	47	38	WD: NE WS: 0.1m/s Rain: Nil	Birds 37-50 Insects 37-41 Train 38-65 Quarry Reverse Alarms <35 Quarry Processing plant <35
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<35

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.3 Assessment Results - Location N3

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location N3 for the NMA are presented in **Table 5**.

Table 5 Operator-Attended Noise Survey Results – Location N3

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
09/11/2020	12:24 (Day)	57	40	35	WD: SE WS: 0.5m/s Rain: Nil	Birds 34-57 Traffic 34-52 Insects <33 Quarry Processing Plant <33
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<33
11/11/2020	09:53 (Day)	60	42	38	WD: N WS: 0.1m/s Rain: Nil	Birds 34-60 Insects 34-38 Traffic 34-54 Quarry Processing Plant <34
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<34

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.4 Assessment Results - Location N4

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location N4 for the NMA are presented in **Table 6**.

Table 6 Operator-Attended Noise Survey Results – Location N4

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
09/11/2020	13:21 (Day)	62	42	38	WD: E WS: 0.7m/s Rain: Nil	Insects <35 Birds 35-62 Traffic 36-44 Train 36-44 Quarry Not Audible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<35
11/11/2020	08:56 (Day)	54	46	43	WD: NE WS: 0.1m/s Rain: Nil	Insects 42-49 Birds 44-46 Traffic 43-54 Quarry Reverse Alarms <35 Quarry Processing Plant <35
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<35

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

5 Discussion

5.1 Discussion of Results - Location N1

Monitoring on Monday 9 November 2020 identified quarry noise was audible during the daytime measurement with quarry noise contributions estimated to satisfy the relevant daytime noise limits. Monitoring on Wednesday 11 November 2020 identified quarry noise was inaudible during daytime measurements. Audible quarry noise sources included the screening plant. Extraneous noise sources measured included birds, traffic, train, insects, and dog bark.

5.2 Discussion of Results - Location N2

Monitoring on Monday 9 November 2020 identified quarry noise was inaudible during the daytime measurement. Monitoring on Wednesday 11 November 2020 identified quarry noise was audible during daytime measurements with quarry noise contributions estimated to satisfy the relevant daytime noise limits. Quarry noise sources included reverse alarms and processing plant. Extraneous noise sources measured included birds, traffic, train, insects, and dog bark.

5.3 Discussion of Results - Location N3

Monitoring on Monday 9 November 2020 and Wednesday 11 November 2020 identified that quarry noise was audible during both daytime measurements with quarry noise contributions estimated to satisfy the relevant daytime noise limits. Quarry noise sources audible during the survey included the processing plant. Extraneous noise sources included birds, traffic, and insects.

5.4 Discussion of Results - Location N4

Monitoring on Monday 9 November 2020 identified quarry noise was inaudible during the daytime measurement. Monitoring on Wednesday 11 November 2020 identified quarry noise was audible during daytime measurements with quarry noise contributions estimated to satisfy the relevant daytime noise limits. Quarry noise sources included reverse alarms and screening plant. Extraneous noise sources measured included insects, birds, traffic, and trains.

This page has been intentionally left blank

6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) for Holcim (Australia) Pty Ltd at the Lynwood Quarry, Marulan, NSW. The assessment was completed to assess the quarry's compliance with the relevant noise criteria during Quarter 4, ending December 2020.

Attended noise monitoring was undertaken on Monday 9 November 2020 and Wednesday 11 November 2020 at four representative monitoring locations. The assessment has identified that noise emissions generated by Lynwood Quarry were occasionally audible, however quarry noise emissions were below the relevant noise criteria, satisfying the applicable noise criteria throughout the survey period.

This page has been intentionally left blank

Appendix A - Glossary of Terms

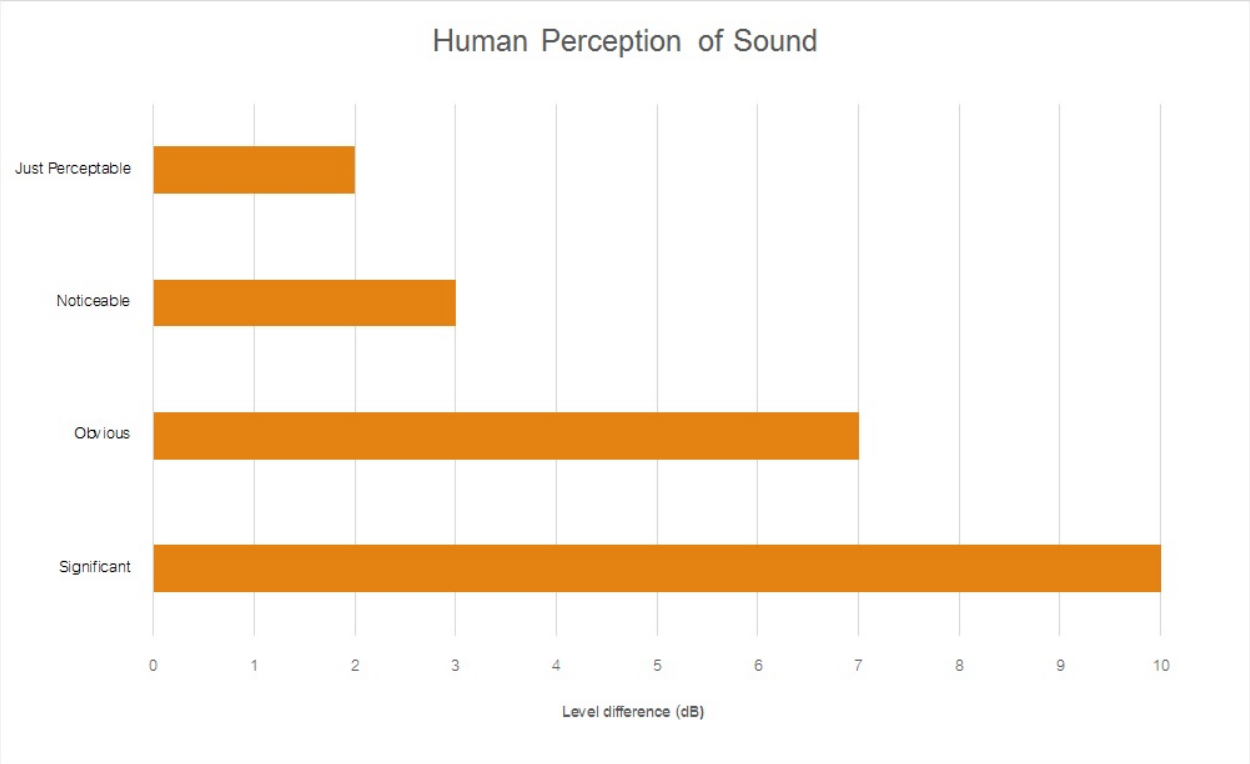
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : = 10.log10 (W/Wo) Where : W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



Muller Acoustic Consulting Pty Ltd
PO Box 262, Newcastle NSW 2300
ABN: 36 602 225 132
P: +61 2 4920 1833
www.mulleracoustic.com

MAC
Muller Acoustic Consulting

APPENDIX 2
Environmental Monitoring Results

Location	Unit	Quarter 1 March 2020	Quarter 2 June 2020	Quarter 3 September 2020	Quarter 4 December 2020
Depth to Water Level					
MP1	m	2.38	2.35	2.24	2.01
MP2		16.58	16.59	16.56	16.63
MP4		20.36	20.21	19.60	19.35
MP5		20.81	21.39	20.72	20.83
MP7		17.48	18.26	17.97	18.15
MP10		5.88	5.73	5.47	5.18
MP11		12.81	12.80	12.08	11.88
GPZ1		11.88	11.83	11.78	11.68
GPZ2		30.33	30.39		
GPZ5		8.20	8.26	8.78	8.48
GPZ6		5.97	6.16	5.64	5.93
GPZ8		9.21	9.03	8.87	8.80
pH					
MP1	pH Units	6.4	6.7	7.2	6.7
MP2		5.9	6.5	6.9	6.5
MP4		6.6	7.5	7.2	6.7
MP5		6.8	6.9	6.9	6.7
MP7		6.6	7.3	7.5	6.9
MP10		6.6	6.7	6.8	6.7
MP11		7.5	7.3	7.3	7.0
GPZ1		7.5	7.6	7.3	7.3
GPZ2		7.2	7.0		
GPZ5		7.5	7.8	7.6	7.5
GPZ6		7.2	7.3	7.2	6.9
GPZ8		7.0	7.2	7.2	7.1
EC					
MP1	µS/cm	1096	1017	907	945
MP2		375	441	260	498
MP4		465	531	446	479
MP5		959	798	679	696
MP7		7777	7148	5165	6412
MP10		7039	6619	6383	6475
MP11		712	732	757	725
GPZ1		976	921	802	813
GPZ2		3192	2783		
GPZ5		3501	3441	3079	3182
GPZ6		1585	1706	1318	1794
GPZ8		2437	2257	1928	2198
Sulphate					
MP1		27	27	24	24
MP2		7	8	5	31
MP4		5	5	5	5

MP5	mg/L	5	5	6	5
MP7		33	27	26	43
MP10		29	29	25	42
MP11		5	5	5	25
GPZ1		16	14	15	34
GPZ2		25	37		
GPZ5		15	5	5	5
GPZ6		30	30	26	31
GPZ8		5	5	5	22
Kjeldahl Nitrogen					
MP1	mg/L	0.2	0.2	0.2	0.2
MP2		0.2	0.2	0.3	0.2
MP4		0.2	0.4	0.2	0.2
MP5		0.7	0.8	0.8	0.5
MP7		0.2	0.2	0.2	0.2
MP10		0.2	0.2	0.4	0.2
MP11		0.2	0.6	0.4	0.2
GPZ1		0.4	0.2	0.4	0.2
GPZ2		1.4	0.4		
GPZ5		1.4	1.2	0.6	0.7
GPZ6		0.2	0.6	0.6	0.3
GPZ8		1.4	1.1	1.0	0.9
Total Phosphate					
MP1	mg/L	1.2	0.4	1.1	0.9
MP2		0.0	0.1	0.1	0.1
MP4		0.1	0.2	0.1	0.1
MP5		0.1	0.1	0.1	0.1
MP7		0.0	0.0	0.0	0.0
MP10		0.0	0.0	0.0	0.0
MP11		0.4	0.5	0.4	0.5
GPZ1		2.1	1.2	1.4	1.5
GPZ2		0.8	1.6		
GPZ5		1.2	2.3	0.7	0.8
GPZ6		2.6	2.5	0.8	1.9
GPZ8		0.1	0.1	0.1	0.1

SW5							
Date	**EC µs/cm**	**pH**	**Suspended Solids**	**Total Oil and Grease**	**Total Phosphorous**	**Total Nitrogen**	**Flow Observations**
			mg/L	mg/L	mg/L	mg/L	
ANZECC Criteria	N/A	6.5 to 7.5	50	10	N/A	N/A	
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
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
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
Average	588.23	6.68	41.44	1.93	0.05	1.51	-
Minimum	75.00	5.30	3.00	1.00	0.00	0.20	-
Maximum	1461.00	7.89	810.00	7.00	0.63	5.60	-
SW6							
ANZECC Criteria	N/A	6.5 to 7.5	50	10	NS	NS	NS
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
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

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
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
Average	**882.63**	**7.00**	**15.68**	**1.86**	**0.04**	**1.01**	**-**
Minimum	**163.00**	**5.50**	**2.00**	**0.90**	**0.00**	**0.04**	**-**
Maximum	**3255.00**	**9.70**	**320.00**	**6.80**	**0.89**	**12.14**	**-**
SW8							
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
Average	**324.34**	**8.00**	**291.90**	**5.77**	**0.22**	**4.14**	-
Minimum	**202.50**	**7.47**	**16.00**	**1.00**	**0.03**	**1.89**	-
Maximum	**477.60**	**8.70**	**830.00**	**14.00**	**0.55**	**5.60**	-
SW9							
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	862	7.27	53	10	0.19	2.8	NF
20/05/2020	675	6.92	76	5	0.18	7.16	NF
11/06/2020	754	7.47	230	5	0.51	5.07	NF
30/07/2020	279.8	7.2	110	5	0.1	0.78	NF
25/08/2020	379	7.91	4.1	5	0.02	4.8	F
3/09/2020	789	7.58	12	6.6	0.04	2	NF
30/10/2020	1301	7.53	5.8	5	0.02	2.6	NF
19/11/2020	1204	7.22	13	5	0.05	1.75	F
14/12/2020	1614	7.33	170	8.9	0.08	1.7	NF
Average	**873.09**	**7.38**	**74.88**	**6.17**	**0.13**	**3.18**	-
Minimum	**279.80**	**6.92**	**4.10**	**5.00**	**0.02**	**0.78**	-
Maximum	**1614.00**	**7.91**	**230.00**	**10.00**	**0.51**	**7.16**	-
SW10							
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
Average	2969.33	7.02	134.60	6.01	0.28	1.16	-
Minimum	2367.00	6.63	5.30	5.00	0.05	0.30	-
Maximum	4087.00	7.80	750.00	10.00	0.80	4.56	-
SW11							
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
Average	2314.77	7.34	264.66	4.55	1.34	6.35	-
Minimum	1090.00	6.62	1.20	1.00	0.02	0.45	-
Maximum	3553.00	7.78	1900.00	10.00	14.00	70.00	-

APPENDIX 3
IEA Action Plan

Lynwood Non - Compliance Summary

Ref No.	Schedule	Parameter	Condition No.	Condition	Auditor's Comments	Compliance	Non - Compliance ID	Holcim's comments	Completion Date
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	Provide annual production data to DRG using the standard form for that purpose. Reported in the Annual review to DPIE. Site is compliant but will be using DRG format during the submission of Annual report in March 2021.	**March 2021**
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, no further actions are recommended following the upgrade.	Non-compliant	NC2	Site is compliant . However equipment performance will continue to be monitored.	-
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 Secretary. This review must consider:	The auditor has not been provided any evidence of a bond review occurring following the previous audit.	Non-compliant	NC3	The rehabilition bond has been updated in Dec 2020 and will be revised to the satisfaction of the Secretary. Incorporated CPI and the future 5 year disturbance forcast.	**Jan 2021**
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	Finalised the process of bond value post the IEA audit. Updated Bank Guarantee will be provided to the secretary in Dec / Jan 2021.	**Jan 2021**

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	Updated Bond has been established. Will be sent to the secretary for review. Existing compliance planners that were set in 2021 also includes the cue for bond revision.	**Jan 2021**
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	The rehabilition bond has been updated and will be revised to the satisfaction of the Secretary. Incorporated CPI and the future 5 year disturbance forcast.	**Jan 2021**
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: "DPIE noted that 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**	NC7	Consult with DPIE for how to close out the issue of non-retirement of credits.	**April 2021**
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 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	Consult with DPIE for how to close out the issue of non-retirement of credits.	**April 2021**

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 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	Consult with DPIE for how to close out the issue of non-retirement of credits.	**April 2021**
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 that the AERs in the reporting period were submitted directly to Council.	**Non-compliant**	NC10	A list of agencies that receive the AERs is included in the AERs.	**March 2021**
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	Close this issue out with DPIE to avoid ongoing non-compliance issues at each audit. Ensure photos are taken during any future archaeological works on site. No videos were taken as reported in the last audit in 2018. A letter will be sent to DPIE stating that no videos were taken and it is only photos.	**Jan 2021**

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	The Lockyersleigh Creek Riparian Area Management Plan has been updated. This will be shared with DPIE for review.	**Submit to DPIE in Dec 2020**
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: 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.	**Non-Compliant**	NC13	For each incident recorded, include the actions taken, or if no action taken state why not.	**Due to nature of the incidents, a summary listing has been given to preserve personal information. If necessary, we can provide a full report with names blanked.**
DA28	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	NOISE (Incorporates OEH GTA) - Noise Mitigation Measures	4 (b)	(b) implement all reasonable and feasible measures to minimise road transportation noise associated with the development;	7 noise complaints are reported in the InControl register. 2 are described as closed and 5 are described as submitted. No significant detail is provided on the nature of the noise complaint. No exceedences have been reported at the times of these complaints.	**Compliant**	Record the detail of the noise complaint and ensure that they are closed out.	Completed	**-**

DA34	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	NOISE (Incorporates OEH GTA) - Operating Hours	5	Blasting Monday-Saturday: 9am to 5pm Sunday and Public Holidays: None	The 2018 and 2019 AERs report compliance. One InControl community complaint is recorded regarding blasting: House shook some time between 13: 00 & 14:00 on 6th August 2019 Incident is recorded but is not listed as closed in InControl. No exceedences are reported in the Blast monitoring report.	**Compliant**	Ensure incidents listed in InControl are closed out.	Completed	-

DA59	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	AIR QUALITY (Incorporates OEH GTA) - Impact Assessment Criteria	12	The Applicant must ensure that dust generated by the development does not cause additional exceedances of the criteria listed in Tables 6-8 at any residence that exists on the date of this consent, or on more than 25 percent of any privately owned land.	2005 EIS Appendix 5. Pages 16 - 18 provides predictions of air quality at 8 locations for 7 years in the 30 year period. 2005 EIS section 5.8.5 of the main text found that only one vacant property may be potentially dust affected. The InControl Incident register details numerous dust complaints received from the community, a number of which relate to dust experienced at residences. A number of these complaints are not listed as 'closed'. Both the 2018 and 2019 AERs list non-compliances regarding air quality monitoring due to equipment failure, however exceedences of the criteria are not recorded. Short term PM10 exceedences are recorded in 2018 but are correlated to regional dust events. Equipment has been upgraded in early 2020 with a change to the solar power supply. The Air Quality Management Plan was revised in 2020 with approval received from DPIE on 11/03/2020.	**Compliant**	Close out all dust complaints in the incident register.	Completed	-

DA84	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	SURFACE AND GROUND WATER (Incorporates NOW and OEH GTAs) - Sediment Dams	18 (a)	(a) Sediment Dams A, B and F are capable of treating the 90th percentile 5-day rainfall event; and	The water management plan was revised in 2020. The dams listed in Table 5 are approved and were conceptual dams based on modelling undertaken as part of the initial Lynwood Quarry EIS (Umwelt, 2005) and the Lynwood Quarry Modification EA (Umwelt, 2015). This table was updated in February 2020 based on the status of dams. Dam A is now a water harvesting Dam. Dam F is specified as both sediment and water storage and has minimum design criteria of 90th percentile 5-day rainfall. Dam B is no longer listed.	**Compliant**	Clarity should be sought around this condition if dams are now assigned different labels, or alternatively the WMP should be updated to state whether these criteria are met if still required to do so		
DA88	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	SURFACE AND GROUND WATER (Incorporates NOW and OEH GTAs) - Operating Conditions	19 (b)	(b) ensure that the accumulated sediment in all the Sediment Dams is kept below 30% of their design capacity;	WMP (2020) states All sediment dams will be managed to ensure that accumulated sediment is kept below 30% of the dam design capacity.	**Compliant**	Suggestion to mark levels at 30 % if feasible, or incorporate program for checking levels systematically.	Program in place to check the levels by sites. Completed.	**-**
DA183	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	REHABILITATIO N AND LANDSCAPING - Rehabilitation and Landscape Management Plan	44 (c)	describe in detail the measures that would be implemented over the next 5 years to rehabilitate and manage the landscape on the site;	The 2018 plan is an update of the 2016 plan which describes rehabilitation between 2016 and 2021.	**Compliant**	The Rehabilitation and Landscape Management Plan will need to be updated to manage for the next five year period within the next 12 months.	Rehabilition and Landscape Management Plan will be updated to refelct the 2020 plan.	**June 2021**
DA193	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	REHABILITATIO N AND LANDSCAPING - Rehabilitation and Landscape Management Plan	46	Within 3 months of the Independent Environmental Audit (see Condition 11 in Schedule 5), the Applicant shall update the Rehabilitation and Landscape Management Plan to the satisfaction of the Secretary.	The current plan is dated May 2018. The previous audit was scheduled for 2017 but was not finalised until 2019 due to delays. As this current plan was updated during this timeframe and following commencement of the audit process, it is considered adequate, although technically non-compliant.	**Compliant**	Ensure that the Rehabilitation and Landscape Management Plan is updated to the satisfaction of the secretary within 3 months of this audit.	Forcast and schedule in Compliance planner. Update the Rehabilition Management Plan with the recent ecology and rehabilitation monitoring of the site (minor edits).	**Feb 2021**

DA220	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS	VISUAL IMPACT - Waste Management	54	The Applicant must ensure that all wastes generated or stored at the site are assessed, classified and managed in accordance with the Assessment, Classification and Management of Liquid and Non-liquid Waste (OEH) guideline, or its successor (incorporates OEH GTA).	Waste Management and Minimisation Strategy Section 3.0 purpose and scope) states that "This Waste Management and Minimisation Strategy (WMMS) has been developed to ensure compliance with Condition 53, Schedule 3 of DA 128-5-2005." The document then presents both condition 53 and 54.	**Compliant**	Edit wording of Waste Management and Minimisation Strategy to explicitly capture condition 54.	Will incorporate in the waste management section	**June 2021**
DA252	SCHEDULE 5 ENVIRONMENTAL	Evidence of Consultation	1A (b)	(b) submit evidence of this consultation as part of the relevant document;	Various revised Management plans contain 'Consultation' sections. RLMP (2018) now has agency consultation in Appendix 9, Noise Management Plan provides it in Appendix 1. Not all revised plans provide the actual consultation (e.g. blast management plan 2020), but do allude to it in the document.	**Compliant**	Append agency consultation to all future revisions of management plans.	Compliance planner to include this.	**Feb 2021**
DA253	SCHEDULE 5 ENVIRONMENTAL	Evidence of Consultation	1A (c)	(c) describe how matters raised by the authority have been addressed and any matters not resolved; and	Various revised Management plans contain 'Consultation' sections which summarise the consultation held. RLMP (2018) now has agency consultation in Appendix 9, Noise Management Plan provides it in Appendix 1. Not all revised plans provide the actual consultation (e.g. blast management plan 2020), but do allude to it in the document.	**Complaint**	Append agency consultation to all future revisions of management plans.	Compliance planner to include this.	**Feb 2021**

DA254	SCHEDULE 5 ENVIRONMENTAL	Evidence of Consultation	1A (d)	(d) include details of any outstanding issues raised by the authority and an explanation of disagreement between any public authority and the Applicant.	Various revised Management plans contain 'Consultation' sections which summarise the consultation held. RLMP (2018) now has agency consultation in Appendix 9, Noise Management Plan provides it in Appendix 1. Not all revised plans provide the actual consultation (e.g. blast management plan 2020), but do allude to it in the document and provide pertinent points.	**Compliant**	Append agency consultation to all future revisions of management plans.	Compliance planner to include this.	**Feb 2021**
DA255	SCHEDULE 5 ENVIRONMENTAL	MANAGEMENT PLAN REQUIREMENTS	2 (a)	(a) detailed baseline data;	This condition was introduced in MOD4 (May 2016) so does not apply to plans prepared prior to this time. Plans revised since this date contain baseline data.	**Compliant**	Provide previously collected detailed baseline data in any future management plan revisions.	Incorporate previous data in management plan reviews	**-**
DA259	SCHEDULE 5 ENVIRONMENTAL	MANAGEMENT PLAN REQUIREMENTS	2 (e)	(e) a contingency plan to manage any unpredicted impacts and their consequences;	This condition was introduced in MOD4 (May 2016) so does not apply to plans prepared prior to this time.	**Compliant**	Provide contingency plans in any future management plan revisions.	Will be incorporated in future updates.	**July 2021**
DA262	SCHEDULE 5 ENVIRONMENTAL	MANAGEMENT PLAN REQUIREMENTS	2 (h)	(h) a protocol for periodic review of the plan.	This condition was introduced in MOD4 (May 2016) so does not apply to plans prepared prior to this time.	**Compliant**	Future updates to plans prepared prior to MOD4 should provide a protocol for periodic review	Will be incorporated in future updates.	**July 2021**
DA268	SCHEDULE 5 ENVIRONMENTAL	REVISION OF STRATEGIES, PLANS & PROGRAMS	5	Within 3 months of the submission of an: (a) incident report under condition 8 below; (b) Annual Review under condition 10 below; (c) audit report under condition 11 below; and (d) any modifications to this consent, the Applicant must review, and if necessary revise, the strategies, plans, and programs required under this consent, to the satisfaction of the Secretary.	Sighted signed 'Evidence of Internal Review' forms indicating review process of all management plans was underway, or complete with a required action. 2018 AER states: During the 2018 report period, management plans were not updated three months after the submission of the Annual Review. It is noted this was corrected in the following reporting period (2019) so assumed to be closed out.	**Note**	Establish a register to ensure accurate tracking of strategy, plan and program updates against required timeframes. Master register has these data.	Completed . Compliance Planner for the site with all the program updates and consent and EPL requirements scoped out for each year. All the management plan requirement are also scoped out.	**-**

DA276	SCHEDULE 5 ENVIRONMENTAL	REPORTING - Incident Reporting	8	The Applicant must notify, at the earliest opportunity, the Secretary and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the development, the Applicant must notify the Secretary and any other relevant agencies as soon as practicable after the Applicant becomes aware of the incident. Within 7 days of the date of the incident, the Applicant must provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.	Incidents appear to be managed as per the requirements.	**Compliant**	PIRMP should be amended to include notification of the Secretary following an emergency incident, as per the requirements of this condition.	Completed in Dec 2020 and uploaded on the website. Will include the notofication to Secretary emergency pathway.	**Feb 2021**
DA286	SCHEDULE 5 ENVIRONMENTAL	REPORTING - Annual Review	10 (h)	(h) calculate the number of additional BioBanking (or equivalent) credits that will need to be purchased, before that clearing can be done; and	AERs present how the number of credits required per stage of development have been calculated for the granite pit and how those credits are being progressively retired.	**Compliant**	Future Annual Environmental Reviews should include information on the additional BioBanking (or equivalent) credits that will need to be purchased or note that no additional credits are required.	Holcim will incorporate these in the Annual Reviews.	**March 2021**

SOC28	APPENDIX 11	APPENDIX 11: STATEMENT OF COMMITMENTS (Final May 2016) - Modification Project Management and Mitigation Measures - Surface Water	N/A (SOC)	• Monitoring of water imported to site, water used on site and water discharged following the guidelines for Water Reporting Requirements for Mines (NSW Office of Water, undated), where applicable.	The WMP (2011) states Holcim will monitor all water used on site, imported to site and overflows from sediment dams. The WMP (2011) does not state if this is in line with following the guidelines for Water Reporting Requirements for Mines (NSW Office of Water, undated). The draft revised WMP (2020) lists guideline used in Section 3.2 but does not refer to Water Reporting Requirements for Mines (NSW Office of Water, undated).	**Compliant**	The revised WMP (2020) should state if the guidelines for Water Reporting Requirements for Mines (NSW Office of Water, undated) have been used in the WMP (2020) development.	The Water Management Plan has been updated and approved in October 2020. New revision will include the guidelines.	**Oct 2021**
SOC29	APPENDIX 11	APPENDIX 11: STATEMENT OF COMMITMENTS (Final May 2016) - Modification Project Management and Mitigation Measures - Surface Water	N/A (SOC)	• The existing surface water monitoring program will be updated to include four additional sites as shown in Figure 2.2 of the Response to Submissions report. The final details of the proposed surface water monitoring program will be contained within the updated Water Management Plan.	The WMP has been further revised in 2020 and is still pending approval. The Surface Water Monitoring Program is appended to the revised WMP and awaiting approval. The previous audit found: The Surface Water Monitoring Program (2018) has since been revised and is currently going through the approval process as part of the Water Management Plan 2018*. It does not include SW1 and SW2 surface water monitoring locations which were in the original Figure (Figure 2.2 of the RTS report) as these related to construction of the Hume Highway intersection is complete. The 2018 and 2019 AERs, do not provide evidence that the requirement of SOC 27 has been met during the audit period.	**Compliant**	Close out revision to Water Management Plan and include relevant updates to surface water monitoring program.	Completed. Comprehensive report with surface and Ground water MP included in 1 report.	**-**

SOC30	APPENDIX 11	APPENDIX 11: STATEMENT OF COMMITMENTS (Final May 2016) - Modification Project Management and Mitigation Measures - Surface Water	N/A (SOC)	• The water quality parameters and frequency of sampling will remain as for the existing approved operations. Flow monitoring will continue to be undertaken by visual observation of the flows during water quality sampling (flow, no-flow).	The auditor has only been provided the 2011 revision of the Surface Water Monitoring Program. The previous audit suggests the most recent revision is from 2018 and suggest compliance. The website contains only the 2011 revision of the Surface Water Monitoring Program.	**Compliant**	The website should be updated to show most recent revision of the Surface Water Monitoring Program if it was indeed approved.	Completed (WMP)	-
SOC31	APPENDIX 11	APPENDIX 11: STATEMENT OF COMMITMENTS (Final May 2016) - Modification Project Management and Mitigation Measures - Groundwater	N/A (SOC)	Holcim Australia will extend the current groundwater monitoring program, which includes both groundwater level and quality, to include the new monitoring piezometers that were constructed for the Granite Pit during the exploration drilling phase. Details of these locations are provided in Appendix 9 of the EA (MOD 4). These bores will be monitored until they are progressively removed by the progression of the Granite Pit or as otherwise refined via the Water Management Plan.	The previous IEA indicates that the Groundwater Management Plan was updated in compliance with the commitment, however the updated plan has not been published on the Holcim website. The auditor was not provided the 2018 revision of the GWMP. The wider Water Management Plan (2020) has been updated and is pending approval. A groundwater Monitoring Program is appended to this.	**Compliant**	Update the website to contain the revised Groundwater Management Plan (2018), or 2020 once approved.	Completed - Comprehensive WMP. Uploaded on the webpage.	-

SOC37	APPENDIX 11	APPENDIX 11: STATEMENT OF COMMITMENTS (Final May 2016) - Modification Project Management and Mitigation Measures - Trust and Reputation	N/A (SOC)	• Existing engagement to continue as appropriate, with a focus on respectful, honest and open communications.	CCC feedback: The committee is working well and acting as an important conduit for community issues and communicating the environmental compliance for the construction and operations of the quarry. This sentiment is also held by members, who appreciate the opportunity to provide feedback to Holcim's project team and management. Holcim always provides the CCC with a thorough update on the quarry, including any milestones, planning updates, construction works, environmental performance, site operations and community relations activities.	**Compliant**	Last update to 'Information Updates' page online appears to be 2015. This page should be updated or merged with other pages that provide the more recent information such as Annual Reviews etc or with the 'Community Link' Lynwood Page which has the most recent update of December 2019.	No, the webpage was upto date. https://www.holcim.com.au/about-us/community-link/lynwood/our-community	-
SOC45	APPENDIX 11	APPENDIX 11: STATEMENT OF COMMITMENTS (Final May 2016) - Modification Project Management and Mitigation Measures - Visual Amenity	N/A (SOC)	• Lighting – quarry operations on the surface including topsoil stripping, overburden extraction and overburden emplacement will be daytime operations only (consistent with current development consent conditions) and therefore do not have any potential to result in lighting impacts.	One complaint has been recorded in InControl regarding fugitive light emissions on 20/02/2019. No details of the complaint are recorded, and it is not stated to be 'closed'. It is unclear if this complaint relates to topsoil stripping.	**Complaint**	Close out the complaint from 20/02/2019 Recommendation: Ensure that enough detail is recorded for complaints in InControl.	Completed	-
SOC61	APPENDIX 11	APPENDIX 11: STATEMENT OF COMMITMENTS (Final May 2016) - Modification Project Management and Mitigation Measures - Gas Pipeline Hazards	N/A (SOC)	• pipelines will be designed in accordance with relevant standards	The auditor has not been provided a copy of any specifications of the pipelines. It is assumed that this would be covered by construction certificates which are up to date. Considered closed by compliance in previous audit.	**Compliant**	Ensure pipelines are designed in accordance with relevant standards.	Noted.	-

EPL38	N/A EPL	N/A EPL	M5.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.	Environmental or community enquiries phone number is featured on Holcim's website: http://www.holcim.com.au/about-us/community-link/lynwood/contact-details (viewed 23/10/20)	**Compliant**	State clearly on the webpage that this number should be used if a community member has a complaint	Active complaints line number has been clearly stated on the webpage. Web page updated.	-