Holcim

Strength. Performance. Passion

Lynwood Quarry

2019 Annual Review

1 January 2019 – 31 December 2019

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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 2019
Annual review end date	31 December 2019
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 2019 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	8 July 2020 Version 3

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 2019 to 31 December 2019 (referred to hereafter as the report period). The compliance of the operation with relevant approvals is summarised in **Table 1.1**.

Table 1.1 below provides a statement of compliance for the report period. The non-compliances have been ranked according to the risk matrix included in **Table 1.2**. A description of each non-compliance is provided in **Table 1.3.**

Table 1.1 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 1.2 Compliance status key for Table 1.3

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 1.3 Non-Compliances 2019

Relevant approval	Condition #	Condition description (summary)	Compliance status	Comment	Where addressed in this Report
DA128-5-2005 (Mod 5)	Condition 15A of Schedule 3	Failure to monitor all required meteorological data at the Lynwood Quarry weather station.	Non-compliant	Lynwood Quarry weather station failed to record temperature data for the months of October, November and December 2019. Issues with the station were resolved on the 3 January 2020.	**Section 6.2**
DA128-5-2005 (Mod 5) EPL 12939	Condition 15 of Schedule 3 Condition M2.2	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	Lynwood Quarry has two HVAS units which measure PM_{10} on a six day cycle in accordance with the requirements of the Development Consent. There were instances during the 2019 report period where the HVAS units did not run on the required day and there were also instances where the units did not run for the required duration in accordance with the Australian Standards. This non-compliance details where the units failed to run. High Volume Air Sampling unit HVAS 1 (EPL point 14) failed to run for the required duration on 39 monitoring occasions during the report period. The failure to monitor was attributed to an insufficient supply of power from the solar panels which power the unit. DPIE were informed of these incomplete monitoring events. High Volume Air Sampling unit HVAS 2 (EPL point 15) failed to monitor from 1 January 2019 to 26 January 2019 (inclusive) and failed to run on the 13 of February 2019. Following an investigation, it was identified that: • 1 January 2019 to 26 January 2019 – outage occurred due to a lightning strike which damaged the unit in December 2018.	**Section 6.3**

Relevant approval	Condition #	Condition description (summary)	Compliance status	Comment	Where addressed in this Report
				Following the reported lightning strike on 28 December 2018, HVAS 2 was inspected by Lynwood Quarry personnel. Repairs were completed on the unit however HVAS 2 continued to experience technical difficulties. • 13 February 2019 – cause of incorrect run time unable to be identified by Holcim. A temporary unit was installed at this location while the permanent unit was sourced Refer to **Section 6.3** for further information.	
DA128-5-2005 (Mod 5) EPL 12939	Condition 15 of Schedule 3 Condition M2.2	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	The HVAS units are required to run for 24 hrs +- 1 hour for each HVAS run. Due to power supply issues during the report period, both HVAS units did not run for the required 24 hrs for a number of monitoring events. DPIE were informed of these incomplete monitoring events. Holcim has undertaken a review of monitoring procedures and power supply at each HVAS unit and actions undertaken have been provided to DPIE in separate correspondence. Further information is included in **Section 6.3** with raw monitoring data included in **Appendix 1A**.	**Section 6.3**
DA128-5-2005 (Mod 5)	Condition 24 of Schedule 3	Failure to monitor groundwater at the locations listed in the Lynwood Quarry Groundwater Water Management Plan.	Non-compliant	Groundwater sampling was not undertaken at the following locations during the report period due to access issues: • MP7 – July and October 2019 • GPZ5 – July 2019 • GPZ2 - during the July 2019 monitoring. Lynwood Quarry has now changed monitoring contractors to improve monitoring consistency. It is also noted that there have been revisions of	**Section 6.4**

Relevant approval	Condition #	Condition description (summary)	Compliance status	Comment	Where addressed in this Report
				the Lynwood WMP modified since the approved Umwelt 2011 document was originally approved. An updated Water Management Plan is being prepared for DPIE and the EPA for comment & is likely to be submitted in Quarter 2 2020.	
DA128-5-2005 (Mod 5)	Condition 44 of Schedule 3	Failure to undertake biodiversity monitoring listed in the Lynwood Quarry Rehabilitation and Landscape Management Plan	Non-compliant	d Fauna monitoring was not undertaken during the reporting period. Refer to **Section 6.7.** Nest box monitoring however was undertaken by an onsite Holcim employee in 2019.	**Section 6.7**

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 **Figure 2.1**).

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 west of the Approved Pit area (refer to **Figure 2.2**). The approval also allowed for the reduction in the extent of the approved pit to reflect limitations within the ignimbrite resource. In 2019 operations continued in the Granite Pit.

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 2.1**.

Table 2.1 Key personnel responsible for environmental management

Name	Role	Company	Contact Details
Declan Close	Quarry Manager	Holcim	0419476900
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 2019 to 31 December 2019. Development Consent requirements along with an explanation of where each requirement is addressed within this document are provided in **Table 2.2**.

Table 2.2 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**
	(e) Identify any discrepancies between the predicted and actual impacts of the	**Section 6.1**

Conditions		Addressed in Section
	development, and analyse the potential cause of significant discrepancies;	
	(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 2.1

Locality Plan

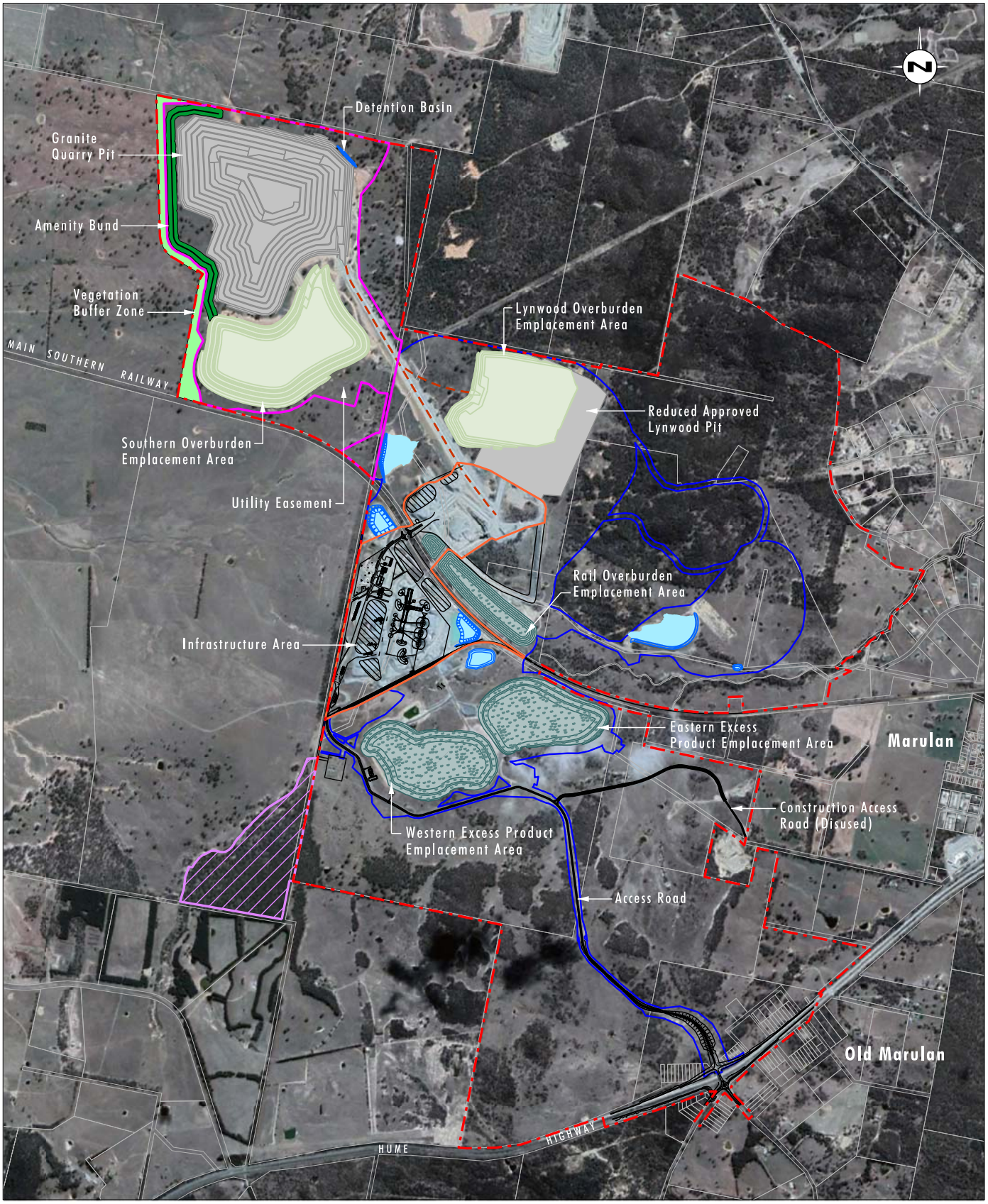

Image Source: Google Earth (2012), Holcim (2012, 2014)
Data Source: LPI (2014), Holcim Australia (2015)

0 0.5 1.0 1.5km
1:30 000

Legend

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

FIGURE 2.2

Overview of Operations

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

3.0 Approvals

Approvals currently held by Lynwood Quarry are listed in **Table 3.1**.

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 northwest 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 3.1**.

Table 3.1 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**.

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 2019.

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 earthern visual amenity bund also continued in 2019.

4.2 Production limits

During the report period, a total of 2,262,468 tonnes of quarry product was transported from the Quarry via road and rail. During the report, 875,630 tonnes of material was transported from the site via road which is well below the approved limit of 1.5 million tonnes. In accordance with Condition 13 of Schedule 2 of the Development Consent.

Table 4.1 provides the annual production and transportation volumes for the 2019 report period and also provides a forecast for the 2020 report period.

Table 4.1 Production summary

Material	Approved limit DA 128-5-2005	2019 report period (actual) (t)	2020 report period (forecast) (t)	Compliance with criterion
Product - total	5 million tonnes from the site in a year	2,262,468	2,539,356	Yes
Product Transported - Rail	5 million tonnes from the site in a year	1,386,838	1,394,196	Yes
Product Transported - Road	1.5 million tonnes from the site in a year by road	875,630	1,145,160	Yes

4.2.1 Hours of operation

Lynwood Quarry operates in accordance with the operating hours specified in **Table 4.2** below.

Table 4.2 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 4.3** below. Product transported by road from Lynwood Quarry is restricted to less than 1.5 million tonnes per annum, with the 2019 report period road transport tonnages being within the approved limits.

Table 4.3 Summary of laden trucks movements 2019

Month	Laden Truck Movements	Product by Road Transport (tonnes)
January	1714	57,270
February	2481	84,203

Month	Laden Truck Movements	Product by Road Transport (tonnes)
March	2284	76,106
April	1694	55,876
May	2605	87,900
June	1841	61,546
July	2316	78,921
August	2518	85,703
September	2147	72,757
October	2169	74,629
November	2353	81,130
December	1807	59,581
Total	**25,929**	**875,622**

4.3 Construction activities

During the report period modifications to the precoat plant within the existing buildings were undertaken along with upgrades to conveyors and feeders within the existing plant area. Further plant upgrades within the existing footprint are expected to take place in the 2020 report period.

Construction of the visual amenity bund commenced in late 2018 with continued construction during the report period. It will continue through 2020 and is expected to be completed during the 2021 report period. The construction of a new stormwater sediment dam was also completed near the Granite Pit during 2019.

5.0 Actions required from previous Annual Review

Following the submission of the 2018 Annual Review, DPIE acknowledged their satisfaction of the report in correspondence received on 7th May 2019. 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.

During the 2018 reporting period an Independent Environmental Audit (IEA) was undertaken. Holcim proposed to undertake a range of activities during the 2019 report period as a result of the 2018 IEA. Actions to be undertaken at Lynwood Quarry during this reporting period are detailed in **Table 5.1**.

Table 5.1 Actions Required for 2019 Annual review

Actions from Previous Annual Review	Works Undertaken	Where addressed in this Document
Implementation of the action identified in the 2018 IEA Action Plan	Ongoing	**Throughout and Section 10**
Revision of the Lynwood Quarry WMP to address comments provided on the Draft WMP submitted to DPE in 2018 whilst also including a review of surface water and groundwater trigger levels for the Quarry	The revised Lynwood Quarry WMP will be submitted to DPIE in Quarter 2 2020. Revised trigger levels in accordance with the WMP (SLR, 2020) for surface water and ground water have been provided in **Section 6.4.2** and **Section 6.5.2** of this Annual Review as these will likely be used going forward.	**Section 6.4** **Section 6.5**
Revision of the site Rehabilitation Bond in accordance with Development Consent requirements	Currently being undertaken, required by 30 December 2020	**Section 6.7**
Meeting of Aboriginal Heritage Management Committee's during May 2019	During the reporting period AHMC meetings were held on the 12 June 2019 and December 2019.	**Section 6.11.2**
Consultation with council regarding construction and occupation certificates required for pre-coat plant constructed in 2018	As described in **Section 4.3** modifications to the precoat plant were undertaken during the report period with further works expected in 2020. An application for building certification was submitted to the local council on 29 November 2019 which will be finalised once the structural works have been signed off, this is expected around April 2020.	**Section 4.3**
Review and revision (if required) of the Lynwood Quarry management plans following the submission of the 2018 Annual Review in accordance with Condition 5 of Schedule 5 of the Development Consent	Revisions of the AQMP, WMP, BMP, RLMP, and EMS was undertaken by SLR Consulting and provided to DPIE between November 2019 and April 2020.	**Section 6** **Section 8** **Section 9**
Review of power supply utilised for HVAS's located at the Quarry	Review & upgrade of power supply undertaken in 2019.	**Section 6.3**

Actions from Previous Annual Review	Works Undertaken	Where addressed in this Document
Continued extraction within the Granite Pit	Extraction of resource within the Granite Pit at the western end of the Quarry as described in **Section 4**.	**Section 4**
Continue works associated with construction of the visual amenity bund to the west of the Granite Pit	Construction of the earthern visual amenity bund, that commenced in 2018, continued throughout the report period and is expected to continue during the 2020 report period as described in **Section 4.3**.	**Section 4.3**

Holcim received comments on the 2019 Annual Review on 5 May 2020 with these comments addressed in the revised Annual Review, dated June 2020.

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 a number of management plans in consultation with relevant stakeholders.

Environmental management plans

The management plans have been prepared for a number of environmental management aspects and include:

- Environmental management strategy (SLR, 2020);
- Rehabilitation and Landscape management plan (SLR, 2020);
- Water management plan (To be finalised by SLR, in Quarter 2 2020);
- Aboriginal heritage management plan (Umwelt, 2018);
- Box gum woodland management plan (Umwelt, 2013);
- Air quality management plan (SLR, 2020);
- Noise management plan (SLR, 2020); and
- Blast management plan (SLR, 2020).

The 2020 management plan updates have been sent to DPIE and Holcim have been liaising with the DPIE regarding their feedback. The Water Management Plan will be sent to DPIE for approval in Quarter 2 2020.

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.

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 noise, air quality, surface water and groundwater.

A Summary of environmental performance during the report period is given in **Table 6.1.**

Table 6.1 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**	Compliant	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.	A revised water management plan will be submitted to DPIE in Q2 2020 and included a revision of surface water trigger levels. It is noted that there was no water discharge from Lynwood Quarry during the report period.
Groundwater (Refer to Section 6.5)	Refer to **Section 6.1.3**/ Refer to **Section 6.5.2**	Non-compliant	Non-compliant due to sampling events which were not undertaken.	A revised water management plan will be submitted to DPIE in Quarter 2 2020 and included a revision of groundwater trigger levels. Monitoring Contractor has been replaced due to poor performance

Aspect	Approval Criteria/ EIS Prediction	Performance during the report period	Trend / key management implications	Implemented / proposed management actions
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**	Non-Compliant	Fauna monitoring was not undertaken during the reporting period. Refer to **Section 6.7**. Nest box monitoring however was undertaken by an onsite Holcim employee in 2019.	Monitoring to be undertaken in accordance with the Rehabilitation and Landscape Management Plan. An ecological consultant has been engaged for the 2020 ecological monitoring.
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.

The EA (Umwelt, 2015) further outlined the implementation of the existing air quality management and monitoring system was suitable to comply with relevant air quality assessment criteria. All depositional dust results recorded during the report period were below impact assessment criteria and consistent with EA predictions. One PM_{10} monitoring event on 26 January 2019 recorded an exceedance of short term impact assessment criteria at HVAS 1, however it is likely that this elevated reading was a result of nearby agricultural activity. Five PM_{10} monitoring events at HVAS 1 and four monitoring events at HVAS 2 recorded exceedance of short term impact assessment criteria during November and December 2019, however at the time of monitoring heavy smoke cover was noted in the region. A discussion of air quality monitoring results recorded during the report period is provided in **Section 6.3**.

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**. 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 levels recorded during the report period were generally consistent with historical levels, with fluctuations recorded since monitoring commenced. 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

The Lynwood Quarry weather station (M1) is located in the vicinity of Lynwood Quarry as shown in **Figure 6.1**. The Lynwood station was serviced in September 2019 however an issue with temperature monitoring occurred in the months of October, November and December of the report period. This is a non-compliance with Schedule 3 Condition 15A meteorological monitoring. Issues with the Lynwood Quarry weather station where resolved on the 3rd January 2020. A summary of the monthly meteorological monitoring results is presented in **Table 6.2**.

Table 6.2 Lynwood Quarry weather station data - 2019

Month	Rainfall (mm)	Cumulative Rainfall (mm)	No of rain days/month	Air Temperature (°C)		Humidity (%)	
				Minimum	Maximum	Minimum	Maximum
January	76.2	76.2	19	12.8	39.7	15.8	100
February	12.8	89	9	8.2	34.6	16.7	100
March	72.2	161.2	12	5	33.7	21.4	100
April	6.6	167.8	8	2.2	26	25.6	100
May	11.2	179	10	-1.2	23.8	25.3	100
June	79	258	15	-3.5	18.4	48.1	100
July	8.8	266.8	10	-1.5	18.4	20.9	100
August	16.6	283.4	12	-4.2	20.5	24.2	100
September	94.4	377.8	7	-2.3	25.6	10.6	100
October	17.2	395	6	-0.1*	30.8*	14.9	100
November	7.4	402.4	4	1.9*	38.5*	9.6	100
December	1.8	404.2	2	4.2*	42.1*	7.9	100
Total	**404.2**	-	**114**	-	-	-	-

**Data taken from the BOM (AWS Station 070330) due to no data at Lynwood Quarry Station (M1)*

6.2.1 Rainfall

Lynwood Quarry received approximately 404.2 mm of rain over 114 rain days during the report period. The highest monthly rainfall occurred during September 2019 (94.4 mm) while December had the lowest monthly rainfall recording 1.8 mm.

6.2.2 Temperature

The maximum temperature recorded during the report period occurred during January (39.7 °C) and the lowest temperature occurred in August (-4.2 °C).

6.2.3 Humidity

The highest humidity recorded during the report period at Lynwood Quarry occurred during all months (100 %) and the lowest was during December (7.9 %).

6.3 Air quality

The AQMP was revised in 2020, with approval received from DPIE on the 11 March 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 6.1**.

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 6.3**.

Table 6.3 Air quality impact assessment criteria

Pollutant	Averaging Period	Criterion
Total suspended particulate (TSP) matter	Annual average	90 µg/ m^3
Particulate matter <10µm (PM10)	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

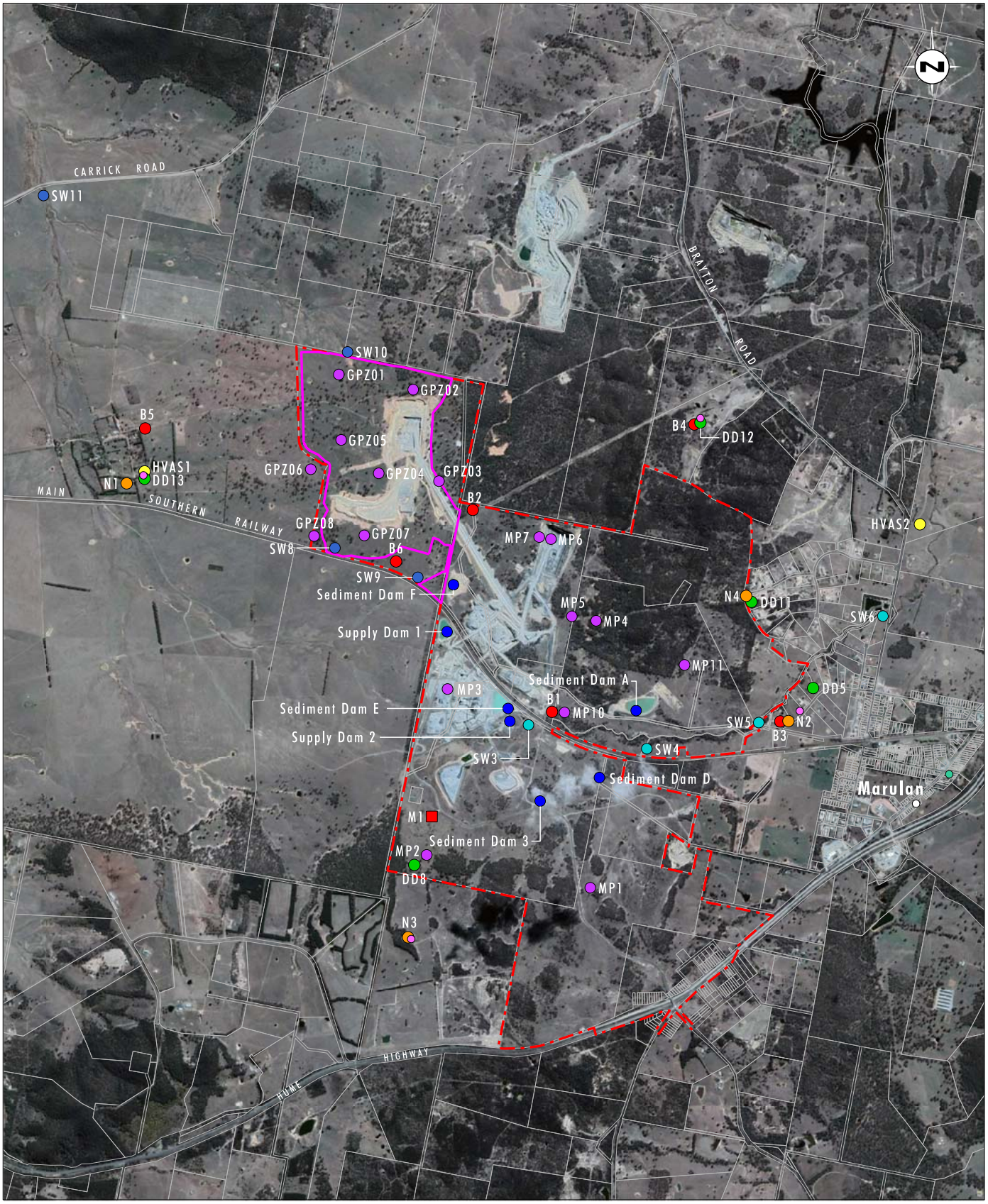

Image Source: Google Earth (2018)
Data Source: LPI (2014), Holcim Australia (2015)

0 0.5 1.0 2.0km
1:45 000

Legend

- Approved Project Area
- Granite Pit Disturbance Footprint
- Meteorological Station
- Depositional Dust Monitoring Location
- HVAS Location
- Blasting Monitoring Location
- Noise Monitoring Location
- Groundwater Piezometer
- Surface Water Monitoring Location
- Site Water Management Dams
- Granite Pit Surface Water Monitoring Location SW8 to SW11
- Residence Location
- Marulan Public School
- Marulan Childrens Centre

FIGURE 6.1

Environmental Monitoring Network

File Name (A4): R01/4541_003.dgn
20190319 14.26

6.3.2 Environmental outcomes

6.3.2.1 Depositional Dust

As noted in **Table 6.4**, 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 1.2 – 3.2 g/m^2/month.

Table 6.4 2019 Depositional Dust Monitoring Results

Month	Total Insoluble Solids (g/m2/month)				
	DD5	DD8	DD11	DD12	DD13
January	2.3	2.8	2.1	2.0	5.8
February	3.3	3.7	3.6	3.0	4.4
March	2.5	2.4	1.8	2.5	2.3
April	1.6	0.6	0.5	0.5	0.6
May	3.3	1.1	1.2	1.2	1.1
June	2.0	0.5	2.4	1.2	1.1
July	1.0	<0.2	0.4	<0.2	0.3
August	2.4	0.4	1.8	0.7	0.9
September	9.1	0.5	7.1	1.2	6.1
October	4.1	0.6	1	0.8	0.9
November	1.4	0.6	1.4	0.7	1.4
December	5.0	0.9	3.0	2.6	1.0
Annual Average	**3.2**	**1.2**	**2.2**	**1.4**	**2.2**

6.3.2.2 PM_{10} / TSP

PM_{10} monitoring via HVAS units 1 and 2 was undertaken during the report period. During the review of PM_{10} data in developing the Annual Review, it was identified that a number of PM_{10} monitoring events at HVAS units 1 and 2 did not record for the entire 24 hour period as required by relevant Australian Standards during 2019. Holcim notes that HVAS 1 is sited in a remote location and is operated on solar power as it is unable to be connected to the mains power supply. During the report period there were a number of occasions where the battery supply challenges resulted in HVAS 1 not running for the entire 24 hour run time. A compliance summary of PM_{10} monitoring data is provided in **Table 6.5** with raw monitoring data and monitoring run times detailed in **Appendix 1A**. Holcim upgraded the solar power source for this unit in the reporting period to ensure it can run for the required durations.

A review of HVAS 2 results and consultation with the monitoring contractor identified that the HVAS unit was affected by a lightning storm in late 2018 and this was reported to Lynwood quarry staff on 28 December 2018. The unit was nonoperational during January 2019 while a replacement was sourced.

Table 6.5 2019 PM_{10} Compliance Summary

Category	HVAS 1	HVAS 2
Total number of HVAS monitoring rounds required in 2019	62	62
Number of completed (24 hours +/- 1 hour) monitoring rounds	23	55

Category	HVAS 1	HVAS 2
Number of incomplete monitoring rounds or not undertaken	39	7

A summary of PM_{10} monitoring results from completed monitoring rounds is provided in **Table 6.6** below.

Table 6.6 Summary of completed PM_{10} monitoring results

	HVAS 1	HVAS 2
Count	61	56
Minimum (µg/m^3)	1.0	1.1
Average (µg/m^3)	18.4	19.5
Maximum (µg/m^3)	154	155

The HVAS was above the short term 24 hour average criteria of 50 µg/m^3 on the occasions given in **Table 6.7**.

Table 6.7 Summary of Non-Compliant PM_{10} monitoring results

Date	PM_{10} (µg/m^3)	Cause
HVAS1		
26 January 2019	55.2	Agricultural activity on Lockeyersleigh at the time of monitoring
22 November 2019	63.4	Heavy bushfire haze in the region (confirmed by the Air Quality readings at the Goulburn monitoring station)
10 December 2019	154	
16 December 2019	59.4	
22 December 2019	81.2	
28 December 2019	113	
HVAS2		
10 December 2019	155	Heavy bushfire haze in the region (confirmed by the Air Quality readings at the Goulburn monitoring station)
16 December 2019	52.6	
22 December 2019	72	
28 December 2019	114	

6.3.3 Trends in data

6.3.3.1 Depositional Dust

A summary of annual average monitoring results from 2014 to 2019 is provided in **Figure 6.1.** 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 6.1,** a comparison of depositional dust monitoring results indicates all sites were compliant with the development consent against maximum allowable annual increase criteria. Sites recorded increases in annual averages between 0.3 g/m^2/month and 1.4 g/m^2/month during the report period. Depositional dust results continue to be below the impact assessment criteria of 4g/m^2/month at all sites.

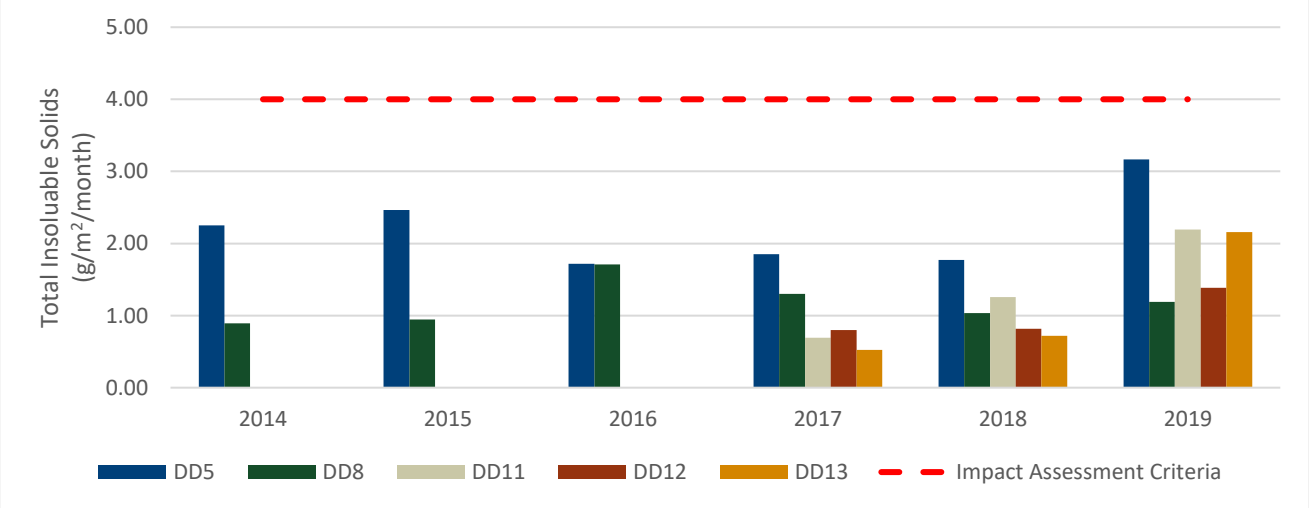

Figure 6.1 Historical Depositional Dust Monitoring

6.3.3.2 PM_{10}

Annual average PM_{10} monitoring results are provided in **Figure 6.2.** As noted in Section 6.3.2, an incomplete dataset was recorded at HVAS 1 and HVAS 2 during the report period. The 2019 average has been populated using data set which was obtained in accordance with the requirements of the development consent. Data which did not run for the required 24 hour sample period was excluded from the data set, with this also being the case in previous years of monitoring. As shown in **Figure 6.2** below and noted in previous Annual Review documents, a data gap is shown during 2013 at HVAS 2 as a result of the unit not recording the required number of readings due to power supply issues.

Based on the available and completed 2019 dataset, monitoring results recorded during the report period are slightly higher than the general historical range, however all readings are below the annual average impact assessment criteria. A year on year comparison of monitoring results noted a relatively large increase of 17.7 µg/m^3 at HVAS 1 at and 7.9 µg/m^3 at HVAS 2. These increases may be attributable to the dry drought conditions and heavy bushfire smoke haze during the 2019 review period.

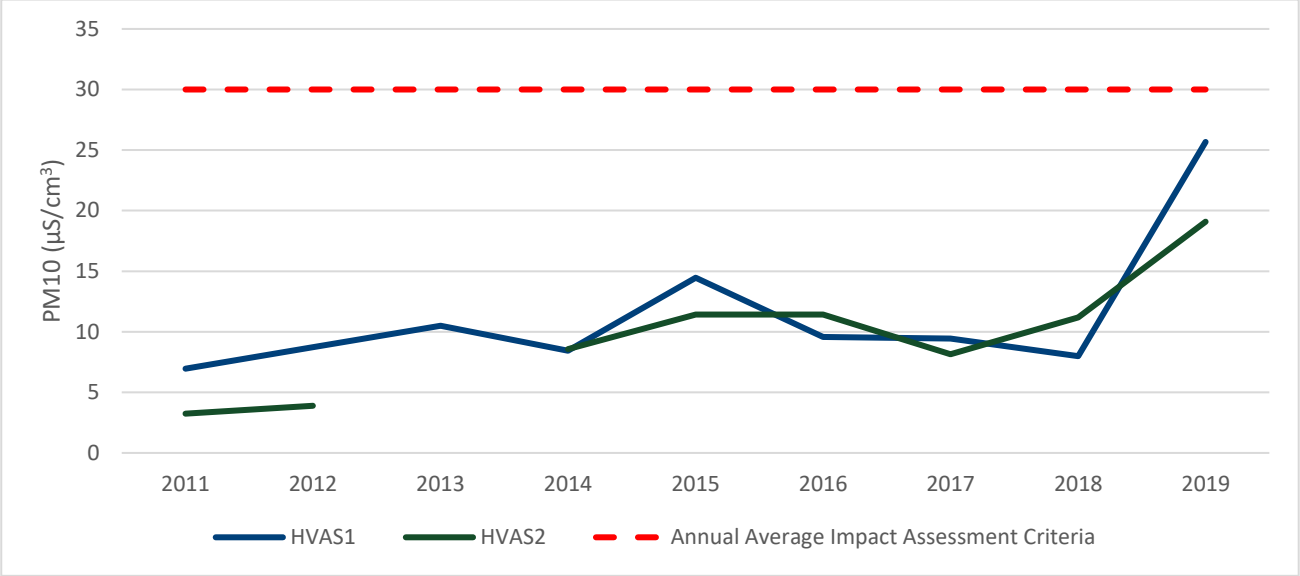

Figure 6.2 Historical PM10 Monitoring Results

6.3.4 Proposed improvements or actions next report period

During the 2019 report period, Lynwood Quarry upgraded the solar power supply to HVAS1 to ensure it was able to run for the required duration.

During the 2020 report period monitoring and air quality management will take place in accordance to the revised AQMP (SLR, 2020).

6.4 Surface water

6.4.1 Environmental management measures

Lynwood has developed and implemented a Surface Water Monitoring Program (SWMP) (Umwelt, 2011) in accordance with the requirements of the Development Consent. The overall Water Management Plan (including component plans) is being revised in 2020 and will be sent to DPIE for comment and approval. This includes a revision of trigger levels which have been implemented 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 only minor changes to water management at site in 2019.

6.4.2 Performance criteria

6.4.2.1 Surface Water Monitoring Criteria/Trigger Levels

Trigger levels are being updated in the 2020 Water Management Plan and are included in **Table 6.8**. These new trigger levels are based on an extended period of monitoring data from Lynwood surface water (SW) locations.

Table 6.8 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 (SW5-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	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 a [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 Joarmin Creek TSS range for the TSS trigger value for SW8 to 11.
[3] SW1 – 4 are no longer monitored, hence there are no proposed criteria. SW7 is 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

As noted in **Section 6.4.1** above, there were no discharges from Lynwood Quarry during the report period.

Surface Water Monitoring Program

Lynwood conducts surface water monitoring across the site on a monthly basis at monitoring locations consistent with those shown in **Figure 6.1**. Surface water monitoring records captured during the report period are provided in **Appendix 1B** with a summary provided in **Table 6.9**. Surface water monitoring is undertaken when an appropriate volume of water is available to enable a representative sample to be obtained. During the report period, SW 9 – 11 were dry or water volume was too low to obtain a representative sample and as such these locations were not sampled. Limited discussion regarding SW 9 – 11 is included below.

Table 6.9 Summary of Results – Surface Water 2019

Site	EC (us/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	536	781	1000	6.8	7.2	7.5	5	9	17	1.0	1.0	1.0	0.02	0.18	0.63	0.71	0.96	1.32	flow (3), no flow (9)
SW6	163	926	1810	6.7	7.4	7.8	2	13	43	0.9	1.0	1.0	0.02	0.12	0.89	0.04	0.88	1.52	flow (12)
SW8	380	380	380	7.8	7.8	7.8	16	16	16	<1	<1	<1	0.08	0.08	0.08	1.89	1.89	1.89	no flow (11), flow (1)
SW9	Dry																		no flow (12)
SW10	Dry																		no flow (12)
SW11	Dry																		no flow (12)

Despite the trigger levels in **Table 6.8** not being in place for the 2019 period, the site would have been compliant for the period. Further comparison of results against the new trigger levels will be outlined in the 2020 Annual Review.

SW5

Monitoring was undertaken on all 12 occasions during the report period. Sampling was undertaken on 4 occasions during the report period, no sampling occurred during 8 occasions due to dry conditions such that a representative sample could not be obtained. A summary of SW5 monitoring results is provided in **Table 6.9**. All results at SW5 during the 2019 report period were below trigger levels described in **Table 6.8**.

The annual average pH is 7.2 with a maximum of 7.5 which is well within the required 2020 trigger level of 5.8 - 9.7. EC results indicate an annual average of 781 µS/cm and maximum value of 1000 µS/cm. These results are consistent with historical values.

Measurements of Nitrogen, TSS and Phosphorous recorded during 2019 were within general range of results recorded during the previous report period. However, the maximum Phosphorus of 0.63 mg/L recorded during September 2019 was higher than the historical maximum yet remained below trigger levels for SW5. Quarry activities would not have influenced this result.

SW6

Monitoring was undertaken on all 12 occasions during the report period. Flow conditions were experienced during all monitoring times with sampling undertaken on all occasions. A summary of SW6 monitoring results is provided in **Table 6.9**.

Surface water monitoring results recorded at SW6 during the report period were generally consistent with results recorded during the 2018 report period. The annual average pH is 7.4 with a maximum of 7.8 which is well within the required range of 5.8 - 9.7. EC results indicate an annual average of 926 µS/cm and maximum value of 1810 µS/cm. The maximum EC recorded is higher than the previous monitoring period by 580 µS/ however remains below trigger levels for SW6.

Measurements of Nitrogen, TSS and Phosphorous recorded during 2019 were within general range of results recorded during the previous report period.

SW8

Monitoring was undertaken on all 12 occasions during the report period. Sampling was undertaken on 1 occasion during the report period, no sampling occurred during 11 occasions due to dry conditions such that a representative sample could not be obtained. A summary of SW8 monitoring results is provided in **Table 6.9**. All results at SW8 during the 2019 report period were below trigger levels described in **Table 6.8**.

SW8 was dry during the 2018 report period, as a result no SW8 samples were collected for comparison to 2019 results. A pH and EC were 7.8 and 380 µS/cm respectively. These levels are within the required range for SW8 trigger levels. Similarly, measurements of Nitrogen, TSS and Phosphorous were within previous ranges.

SW9, SW10, SW11

Monitoring was undertaken on 12 occasions during the report period for SW9, SW10 and SW11. Dry conditions were observed during all monitoring periods resulting in no sample being collected.

6.4.4 Trends in data

During the report period, a range of the surface water monitoring locations had limited surface water sampling undertaken as the locations did not have an appropriate volume of water available to enable a representative sample to be obtained due to the low rainfall recorded during the report period. This resulted in surface water sample results not being obtained for locations SW9, SW10 and SW11 during the

report period. Samples taken at SW8 could not be compared to previous monitoring data due to dry conditions experienced during the 2018 monitoring period. Sample results obtained for SW5 and SW6 were generally consistent with the results obtained for the 2018 report period.

6.4.5 Proposed improvements

Future Annual Reviews will compare results against longer term trends and trigger levels from the WMP.

6.5 Groundwater

6.5.1 Environmental management measures

Lynwood has developed and implemented a Groundwater Monitoring Program (GMP) (Umwelt, 2011) in accordance with the requirements of the Development Consent. The WMP is being revised in 2020 by SLR and will be sent to DPIE for comment and approval. This includes a revision of trigger levels which have been implemented in this annual review.

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 noted in Section 3.0 of the GMP (Umwelt, 2011), 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 Project EA (Umwelt, 2015). Triggers for groundwater depth have been developed in 2020 (see **Table 6.10**) and will be reviewed in the next Annual Review.

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 6.10**. These new trigger levels are based on an extended period of monitoring data from Lynwood GW locations.

Table 6.10 Groundwater Monitoring Criteria for MP Series Bores (WMP, SLR 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	11,521	This was the highest EC reading since monitoring commenced for the MP

Parameter	Minimum Trigger	Maximum Trigger	General comment
	required		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 6.11**, with full results given within **Appendix 1**.

Monitoring was undertaken at the required frequency (quarterly) for all monitoring bore sites with the exception of MP7, GPZ2 and GPZ5. MP7 was not sampled during Q3 or Q4. GPZ2 was not sampled during Q4 and GPZ5 was not sampled during Q3.

Table 6.11 Summary of Results – Groundwater 2019

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	2.0	2.2	2.4	6.2	6.3	6.3	1090	1108	1130	31	31	31	0.05	0.10	0.17	0.4	0.5	0.9
MP2	6.1	13.5	16.4	5.4	5.7	5.9	321	390	430	18	18	19	0.11	0.15	0.23	0.0	0.3	0.4
MP4	19.8	20.2	20.7	6.2	6.3	6.4	438	450	459	16	17	17	0.14	0.19	0.32	0.2	0.3	0.4
MP5	20.5	20.8	21.0	6.4	6.5	6.6	830	845	861	13	13	13	0.87	0.94	1.00	0.1	0.3	0.4
MP7	17.1	17.5	17.8	6.1	6.2	6.3	5620	6855	8090	84	96	108	0.11	0.14	0.16	0.4	0.4	0.4
MP10	5.5	5.8	6.0	6.4	6.5	6.6	7010	7193	7580	85	103	152	0.05	0.13	0.18	0.0	0.3	0.4
MP11	12.6	12.8	13.0	6.7	6.9	7.0	671	683	695	16	16	17	0.24	0.26	0.30	0.0	0.3	0.4
GPZ Bores																		
GPZ1	10.9	11.3	11.6	7.4	7.5	7.5	937	968	1010	26	27	29	0.22	0.26	0.30	0.4	0.9	1.3
GPZ2	13.0	19.0	23.9	6.4	6.6	6.8	3140	3803	4470	25	43	76	0.05	0.09	0.14	0.4	0.4	0.4
GPZ5	7.2	7.5	7.8	7.5	7.6	7.7	3650	3750	3860	17	38	73	0.97	1.02	1.05	0.4	0.4	0.5
GPZ6	6.1	6.2	6.3	6.8	6.9	7.0	1710	1790	1870	34	37	40	0.23	0.36	0.60	0.4	0.6	1.3
GPZ8	8.9	9.0	9.3	6.6	6.8	6.9	2120	2318	2480	13	13	14	1.60	1.71	1.80	0.1	1.0	3.3

6.5.3.1 Depth to groundwater

Groundwater levels at MP series bores fluctuated between 0.4-0.9 m during the report period and generally remained within historical range except for MP2, which recorded a fluctuation of 10.3 m. The depth to water result at MP2 Q1 of 6.1 m is an anomaly with values reverting to within historical range in the remainder of the report period.

Groundwater levels at GPZ series bores fluctuated between 0.3-0.7 m during the report period and generally remained within historical range except for GPZ2, which recorded a fluctuation of 10.9 m. The depth to water result at GPZ2 increased throughout the report period to levels significantly higher than the range of results recorded in the 2018 report period.

Bore GPZ2 is located near the northern face of the quarry, on or near a fault zone that runs through the granite pit. As the pit developed and its depth increased below the level of the water table significant inflow of water was experienced via the fault throughout Q4. This would be the cause of the large change in water table at this bore.

6.5.3.2 pH

All pH monitoring results recorded at both MP series and GPZ series bores were within 2020 investigation trigger level ranges identified in **Table 6.11** and remain within general range of results recorded during the previous report period.

6.5.3.3 Electrical Conductivity

All EC monitoring results recorded at MP series bores were within 2020 investigation trigger level ranges. The EC results experienced at MP7 during the Q4 2018 monitoring period were significantly lower than historical values at this site. The 2019 monitoring values have now reverted back to the historical range with an annual average of 6855 µS/cm and maximum of 8090 µS/cm.

EC monitoring results recorded at GPZ series monitoring bores were within 2020 investigation trigger level ranges. Results within each bore were relatively consistent with the exception of the GPZ2 which experience a slightly higher annual average and maximum value of 3803 µS/cm and 4470 µS/cm respectively.

6.5.3.4 Nutrients

Sulfate

All sulfate monitoring results recorded at MP series bores were within 2020 investigation trigger level ranges. Elevated levels of sulphate were experienced at MP4, MP5, MP7, MP10 and MP11 compared to the previous monitoring year.

All sulfate monitoring results recorded at GPZ series bores were within 2020 investigation trigger level ranges. However, elevated levels of sulphate were experienced at GPZ2, GPZ5, GPZ6 and GPZ8 outside the range of historical values. Sulphate levels ranged from 13 to 76 mg/L.

Nitrate

All nitrate monitoring results recorded at MP series bores were within 2020 investigation trigger level ranges. One elevated nitrate measurement of 0.32 mg/L was recorded at MP4 during the report period compared to historical values however this remains below the trigger level.

All nitrate monitoring results recorded at GPZ series bores were within 2020 investigation trigger level ranges. All results remain within the general range of historical values with the exception of one elevated nitrate measurement of 0.50 mg/L recorded at GPZ2 during the report period however this remains below the trigger level.

Phosphate

All phosphate monitoring results recorded at MP series bores were below 2020 investigation trigger limits during the report period.

All phosphate monitoring results recorded at GPZ series bores were within 2020 investigation trigger level ranges. Phosphate levels at GPZ6 were slightly elevated compared to historical values with a maximum of 1.34 mg/L.

Quarrying activities would not have impacted the results of the nutrient testing.

6.5.4 Proposed improvements

Future Annual Reviews will compare results against longer term trends and trigger levels from the WMP. Holcim are committed to improving groundwater monitoring data collection in 2020. It is noted that no further monitoring is proposed for GPZ2 due to the pit expansion.

The Water Management Plan has been updated to remove GPZ2.

6.6 Noise

6.6.1 Environmental management measures

A Noise Monitoring Program (NMP) (Umwelt, 2016) has been prepared in accordance with the requirements of the Development Consent which describes measures for monitoring and managing noise emissions at Lynwood. This document is currently being updated by SLR and has been submitted to DPIE for approval. There were no changes to monitoring or mitigation measures as part of that review. Management measures undertaken onsite to ensure compliance against the requirements of the Development Consent include a range of design controls, ongoing operational controls and a program of compliance monitoring.

6.6.2 Performance criteria

Noise impact assessment criteria for monitoring are specified in the Development Consent are outlined in **Table 6.12** below.

Table 6.12 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

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, $LA1_{(1min)}$
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, 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 during January, May, September and November at the locations shown in **Figure 6.1** and listed in **Table 6.13**. 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).

Quarterly monitoring identified that noise emissions generated by Lynwood Quarry were audible during all measurements, however all results remained below relevant noise criteria at all assessed residential receivers. There were no exceedances of the impact assessment criteria detected during quarterly monitoring conducted during the report period as shown in **Table 6.14**.

Table 6.13 Noise Monitoring locations

Location	NMP ID	Address
N1	L1	South Eastern Boundary of 1114 Carrick Road, Marulan
N2	L6	End of Maclura Drive, Marulan
N3	L11	Northern Boundary, 16038 Hume Highway, Marulan
N4	L12	Corner of Dorset and Suffolk Road, Marulan

Table 6.14 Day Time Noise Monitoring Summary

Location	Criteria	Q1	Q2		Q3		Q4		Compliant
		30/1/19	22/5/19	23/5/19	10/9/19	11/9/19	19/11/19	21/11/19	
Day dBA, $LA_{eq(15min)}$									
N1	35	Quarry not operating			<30	Quarry	<30	<30	Yes

Location	Criteria	Q1	Q2		Q3		Q4		Compliant
		30/1/19	22/5/19	23/5/19	10/9/19	11/9/19	19/11/19	21/11/19	
N2	35				<30	not operating	<30	<33	Yes
N3	35				<25		<35	35	Yes
N4	35				<30		<30	<30	Yes
Evening dBA, $LA_{eq(15min)}$									
N1	35	<23	<35	Quarry not operating					Yes
N2	35	<26	<30						Yes
N3	35	35	29						Yes
N4	37	<29	<30						Yes
Night dBA, $LA_{eq(15min)}$									
N1	35	<21	Quarry not operating	<35	No Data	<30	Quarry not operating		Yes
N2	35	34		<30		<35			Yes
N3	35	35		<30		<35			Yes
N4	35	31		<20		<30			Yes

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 are able to be relocated. Pre-clearance surveys also identify if nest boxes are required to 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 6.15** below. It is noted that the current status of credits which have been retired are detailed in **Table 6.16**.

Table 6.15 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
Total	**1,725**

6.7.3 Environmental outcomes

Lynwood cleared approximately 9 ha as part of operations for the granite pit extension area. As noted within **Table 6.16** below, Lynwood retired a total of 3,669 Biodiversity Credits during 2018 with no biodiversity credits retired in 2019. Obligations around biodiversity credits will continue to be addressed in the 2020 annual review period. 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 6.16**.

The full ecological monitoring was not undertaken during the reporting period. Nest box monitoring however was undertaken by an onsite Holcim employee. An ecologist has been engaged to undertake the 2020 ecological monitoring.

Table 6.16 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 2019 report period, no ecological monitoring was completed, however nest box monitoring was completed. The 2019 nest box monitoring results were:

- 50 nest boxes were monitored during the 2019 monitoring;
- All nest boxes were observed to be in good to very good condition;
- 18 nest boxes were in use at the time of monitoring including 4 with an animal present; and
- 4 nest boxes had no sign of current or historical animal presence.

Nest box and fauna monitoring is to be completed in 2020. The management measures as detailed within the RLMP will also continue to be implemented for ongoing operations including the management requirements related to any clearing required to be undertaken on site.

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 management of all species. Due to undesirable conditions, aerial weed spraying for Serrated tussock management was postponed to January 2020.

No additional management or mitigation measures are proposed to be implemented which are outside the scope of the existing approved RLMP during the next report period.

6.8.2 Feral animals

Feral animal management at Lynwood Quarry during the report period consisted of a kangaroo and pest cull that was undertaken in April 2019.

No additional management or mitigation measures are proposed to be implemented which are outside the scope of the existing approved RLMP during the next report period.

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 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**). Only one Blast occurred within the Ignimbrite pit in 2019. The monitoring results for this blast met the impact criteria.

6.9.2 Performance criteria

Blasting performance criteria is set out in the EPL and Development Consent as outlined in **Table 6.17**

Table 6.17 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 6.18**. 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 6.17**.

Table 6.18 Blast Monitoring Summary

Parameter Summary	**Number of Blasts**	**Percentage of Blast (%)**
Total Number of Blasts	80	N/A
Blasts in Ignimbrite Pit	1	1%
Blasts in Granite Pit	79	99%
Blasts exceeding allowable overpressure criteria	0	0%
Blasts exceeding allowable ground vibration criteria	0	0%
Blast Capture Rate (%)	100% capture rate	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 needed basis. A summary of the types and quantities of waste generated during the report period is provided in **Table 6.19**.

Table 6.19 Waste generated in the report period

Waste	Quantity 2019	Quantity 2018
Cardboard (t)	1.8	47
General Waste (t)	54.7	201.1
Steel (t)	90.28	106.96
Rubber (t)	*Included in General Waste*	14.24
Wood (t)	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)	20	24
Rags (number of bins)	*Included in General Waste*	1
Grease (L)	0	4

Waste generated during the report period is generally consistent with 2018, however, significantly less cardboard and general waste was produced. A number of waste items have been collected under one item during the 2019 report period as indicated in **Table 6.19.**

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 of 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 November 2019 annual site monitoring within the Lynwood Quarry

project area found most sites were being managed in accordance with the relevant requirements. Vegetation had decreased substantially due to prolonged drought and erosion had increased slightly at small number of locations, however, was generally found to be stable. The stability of the sites, despite the decreased cover of vegetation, is assessed as related to the removal of stock since 2010 and the decrease in human visitation/agricultural activity. While no Aboriginal sites had been adversely impacted by quarry activities a number of management recommendations were identified during the November 2019 site monitoring. These recommendations are set out below.

1. Repair fencing at sites IF2, MQ1, MRN1, MRN2, MRN4, MRN17, MRN18, MRN19, MRN20, MRN23, MRN34, MRN49, MRN50, MRN51, MRN55, Marulan T6 S1, Marulan T6 S2, Marulan T6 S3 and Marulan T6 S4.

2. Remove blackberry using a methodology consistent with the AHMP at sites IF2, MRN1, MRN2, MRN3, MRN4, MRN13, MRN14, MRN15, MRN16, MRN17, MRN18, MRN39, MRN40, MRN41, MRN42, MRN43, MRN55, MRN56, MRN69, MRN82, Marulan T1 S2, Marulan T1 S6, Marulan T1 S7, Marulan T1 S8, Marulan T1 S9 and MRN PAD1.

3. Remove prickly pear from MRN12 site area.

4. Renew site name plate at MRN6, MRN8, MRN9, MRN10, MRN11, MRN12, MRN13, MRN14, MRN15, MRN16, MRN17, MRN18, MRN19, MRN20, MRN21, MRN22, MRN23, MRN38, MRN42 (multiple name plates required), MRN51, MRN56, MRN69, MRN75, MRN76, MRN82, MRN83, Marulan T1 S4, Marulan T1 S5, Marulan T1 S6, Marulan T1 S7 and MRN PAD1.

5. Investigate origin of stone cairn recorded to the south-west of IF3.

6. Block gap under the fence at MRN3 where kangaroos are going under and water drains down to creek causing loss of artefacts. Leave area for kangaroos to go through that is on higher ground and will not result in artefacts washing away.

7. Remove litter, roll of wire from MRN15 site area.

8. At site MRN16 extend the fencing approximately 10 metres to the east to incorporate all artefacts.

9. Move the fence at MRN30 and erect new fence, new signage and name plate.

10. As part of the conservation works the tree trunk at MRN74 still needs to be banded and stacked wood removed. MRN74 name plate is to be renewed and the site included in a roofed enclosure, along with information signage and an even path for visitors to be installed as part of the proposed landscaping works.

11. At MRN76 dead tree fall and deep leaf litter should be kept away from around the tree to protect it from bushfire.

12. In an appropriate manner consist with the AHMP rabbits should be managed at Marulan T1 S2.

13. Erect signage and consider fencing at MRN PAD2, MRN PAD3 and MRN PAD4 along the limit of works indicating Protected Area, No Unauthorised Access.

14. Provide a name plate and required signage (Protected Area, No Unauthorised Access) at sites LA33, LKIF1, LKAS5, LKAS6, LKST1, LKST2, PAD6.

15. Remove fallen timber from around tree to reduce bushfire hazard at LKST1

16. Fence site LKST2, band the tree trunk, remove the cement that has been dumped next to the tree and construct roofed enclosure over tree.

17. Fence PAD6.

Lynwood Quarry will complete the above recommended actions. Progress against these recommendations will be reported in the 2020 Annual Review.

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 2019. During the report period AHMC meetings were held on the 12 June 2019 and December 2019.

Holcim has met with representatives of the Aboriginal stakeholder groups on a monthly basis since May 2019 in regard establishing a Keeping Place facility on the quarry site. Issues such as monitoring & maintenance of sites & Cultural Awareness Training were discussed in these meetings. Holcim believes that as these meetings took place monthly throughout the report period and including discussion of the management of Aboriginal heritage sites, along with the two AHMC meetings, this is compliant with the AHMP.

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 with regular meetings.

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 in July 2018. No further revisions were required during the 2019 reporting period.

6.12 Non-indigenous heritage

No additional European Heritage management actions were undertaken during the 2019 report period. The Old Marulan European heritage report was reviewed during the 2017 report period. All actions arising from this review were completed during the 2017 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 reporting period bushfires occurred within the area, the closest taking place 8 km away from Lynwood Quarry. 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 2020, with this sent to DPIE for comment and approval.

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. During the report period 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 site on an as needs basis is continually tracked against its licenced allocation. During the report period, Lynwood pumped approximately 84 ML of water from Johnniefields Dam for onsite use, the 4ML over the allowable 80ML water sourcing limit was granted under the landholder's agreement. **Table 7.1** provides a summary of water take during the report period.

Table 7.1 2019 Water Take Summary

Water Licence	Water sharing plan, source and management zone (as applicable)	Entitlement	Passive take/ inflows	Active pumping	Total
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.	2 units (ML)	84 units (ML)	84 units

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).

During the expansion and continued development of the Granite Pit in the report period, ESC structures and clean water diversions were constructed and maintained. One additional sediment dam was constructed during the report period. 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 (SLR, 2020) and RLMP (SLR, 2020).

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 (Umwelt, 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 2019. Sections of the amenity bund are expected to become open for temporary stabilisation during the 2020 reporting period. Temporary seeding of topsoil stockpile areas may be undertaken opportunistically during 2020 to establish or enhance ground cover and reduce the potential for loss of soil substrate. 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 8.1**.

Table 8.1 Rehabilitation status

Quarry Area Type	Previous Report period (actual) 2018 (ha)	This Report period (actual) 2019 (ha)	Next Report period (forecast) 2020 (ha)
A. Total quarry footprint (all areas including active disturbance areas and rehabilitation areas)	36	42	40
B. Total active disturbance (areas within the footprint still requiring rehabilitation)	208	216	256

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

**Conservation area currently undergoing active rehabilitation 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

Rehabilitation of 11ha within the Conservation Area was undertaken in 2019 and is expected to continue in 2020. Tree planting over several hectares is proposed in 2020 to construct windbreaks for the stockpile area.

9.0 Community

9.1 Community Engagement

9.1.1 Community Consultative Committee Meetings

Two community consultative committee (CCC) meetings were held in 2019 with meetings on 26 April 2019 and 25 October 2019. During these meetings, information was presented on general quarrying operations, the Granite Pit operations, environmental management, compliance, complaints and community initiatives. The outcomes of the CCC meetings are detailed in the meeting minutes available on the Lynwood Quarry website.

9.1.2 Community Activities

Lynwood Quarry supported numerous community-based activities during the report period. These activities are listed below.

- Holcim Mayor's Charity Golf Day;
- Kite Festival;
- Gibraltarr Rd Residents (provide road base materials);
- Marulan Pony Club;
- Chamber of Commerce;
- Marulan Christmas Carols;
- Tallong Apple Festival;
- Marulan Soccer Club;
- Kreative Koalas;
- Lions Christmas Lights Tour and BBQ; and
- Australia Day – Goulburn and Marulan.

Lynwood Quarry also promoted activities of the Quarry through articles in the local newspaper (Discover Marulan), Community Information Sessions and a Community Perception Survey.

9.1.3 Community Investment Fund

The Community Investment Fund (CIF), dedicated to the Marulan and surrounding communities, is designed to improve the quality of life of the members of our 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 within a 20 km radius of the quarry. Since inception of the CIF Lynwood Quarry has invested $217,239.00 on projects in the region. **Table 9.1** details the approved CIF funded projects since the CIF inception.

Table 9.1 Approved CIF funded projects since CIF Inception

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

Lynwood Quarry received a total of 47 complaints during the report period. Complaints received consisted of:

- 41 air quality complaints;
- Four noise complaints; and
- Two other complaints (light, fencing and runoff).

The air quality complaint occurred mainly between July and October. This period was at the height of the drought. Strong westerly winds were also experienced over this period, blowing through the property straight to town. Despite the number of complaints Holcim has maintained compliance with the dust deposition conditions in the site's consent.

Holcim developed and has been working to implement a dust management improvement program, which has been incorporated into its EPL. Holcim has co-operated with investigations into the air quality complaints by the EPA & DPIE.

Complaints were managed in accordance with the complaints management and dispute resolution procedure detailed in the Lynwood Quarry EMS (SLR, 2020). Depositional dust and noise monitoring data was reviewed following the complaints to determine compliance with Development Consent criteria. Lynwood quarry were below criteria for depositional dust and noise at the time the complaints were received.

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).

A summary of complaints received by Lynwood Quarry between 2014 and 2019 is presented in **Table 9.2**.

Table 9.2 Comparison of complaints for Lynwood 2014 - 2019

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

10.0 Independent Audit

An Independent Environmental Audit (IEA) was conducted on 9 January 2018. This was the third Independent environmental audit for the quarry.

This IEA needed to be commissioned by 30 September 2017 as per Schedule 5, Condition 11 of the DA 128-5-2005. An IEA is now required every 3 years, unless the Secretary directs otherwise.

This IEA was commissioned prior to 30 September 2017, as required by Schedule 5, Condition 11 of DA 128 - 5- 2005. The IEA inspection could not be scheduled until 9 January 2018. This was three years and three months after the last IEA site inspection (22 October 2014). A range of documents were collected during the IEA but Holcim (Australia) needed to supply a range of further documents to allow the IEA to be completed. These were provided in April 2018, October and November 2018. The delays were due to the personal circumstances of members of the auditing team that meant that they were unable to assist with the audit for long periods. This was exacerbated by the departure of the key personnel from Holcim which delayed the Holcim review of the draft audit report and the provision of the final audit evidence. The IEA was finalised within one week of receiving this information.

This resulted in the IEA report being completed well after the 12 - week requirement specialised in Schedule 5, Condition 12 of DA 128-5-2005. Holcim (Australia) liaised with DPE regarding some of these delays.

11.0 Incidents and non-compliances during the report period

No penalties were received during the report period however Holcim received some letters from DPIE regarding non-compliances. Non-compliances at Lynwood Quarry during the 2019 report period are detailed in **Section 1.0**. The Lynwood Quarry Pollution Incident Management Plan was tested during the report period and is now available on the Holcim website.

12.0 Activities to be completed in the next report period

Lynwood Quarry proposes to undertake a range of activities during the 2019 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 2020 include:

- Complete implementation of the action identified in the IEA Action Plan;
- Implementation of 2020 environmental management plans;
- Revision of the site Rehabilitation Bond before 30 December 2020 in accordance with Development Consent requirements;
- Continue application regarding construction and occupation certificates required for pre-coat plant in consultation with council;
- 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.

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APPENDIX 1
Noise Monitoring Reports

Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW
Quarter 1 Ending March 2019.

Prepared for: Holcim (Australia) Pty Ltd
February 2019
MAC180611-02RP3

Muller Acoustic Consulting

Document Information

Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW

Quarter 1 Ending March 2019

Prepared for: Holcim (Australia) Pty Ltd

Prepared by: Muller Acoustic Consulting Pty Ltd
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Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
MAC180611-02RP3	Final	5 February 2019	Nicholas Shipman		Oliver Muller	

CONTENTS

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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 2019, 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**.

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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, $LA_{eq(15min)}$	dB, $LA_{eq(15min)}$	dB, $LA_{eq(15min)}$	dB, $LA_{1(1min)}$
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.

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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		
			Day	Evening	Night
N1	L1	South Eastern Boundary of 1114 Carrick Road, Marulan[1]	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.

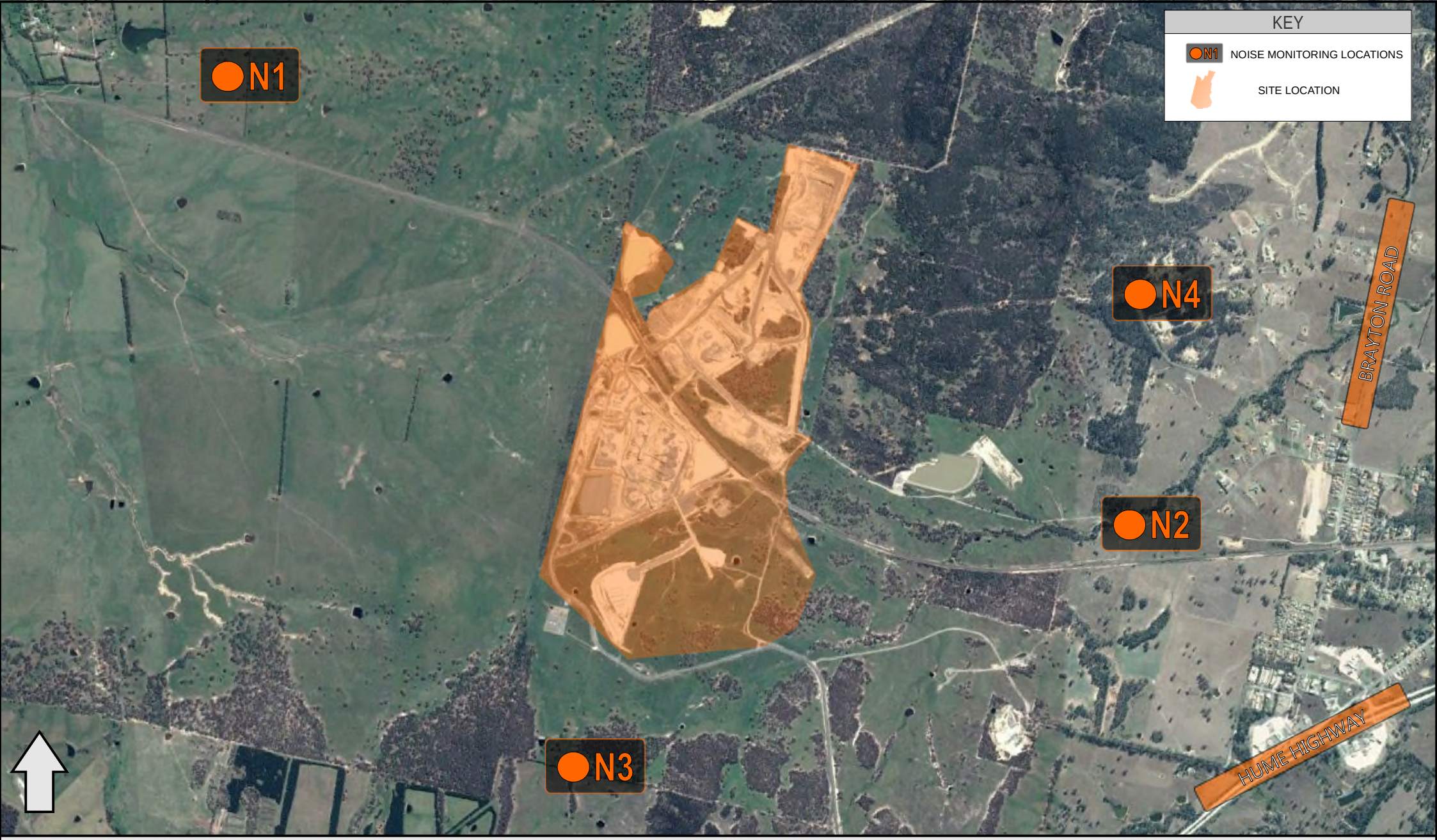
3.2 Assessment Methodology

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 30 January 2019. The acoustic instrumentation used carries current NATA calibration and complies with AS IEC 61672.1-2004-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 30 January 2019 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.



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Muller Acoustic Consulting

FIGURE 1

LOCALITY PLAN

REF: MAC180611-02

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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}		
30/01/19	21:34 (Evening)	59	36	33	WD: WNW WS: 2m/s Rain: Nil	Insects <30 Wind in trees 30-35 Train 38-59
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<23
30/01/19	22:01 (Night)	52	36	31	WD: WNW WS: 2m/s Rain: Nil	Insects <30 Aircraft 31-49 Wind in trees 30-34
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<21

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}		
30/01/19	19:24 (Evening)	53	39	36	WD: WNW WS: Calm Rain: Nil	Insects <38 Birds 38-40 Distant traffic 38-53 Dog bark <38
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<26
30/01/19	23:00 (Night)	60	42	35	WD: WNW WS: Calm Rain: Nil	Insects <32 Highway traffic 32-40 Holcim haul trucks and reverse alarms 32-34 Train 36-60
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.

4.3 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}		
30/01/19	19:49 (Evening)	54	40	36	WD: NNW WS: 2.5m/s Rain: Nil	Insects 37-42 Wind 38-52 Birds 36-41 Holcim haul trucks and reverse alarms 33-37 Train 38-45
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						35
30/01/19	23:34 (Night)	49	39	37	WD: WNW WS: Calm Rain: Nil	Insects <36 Distant highway traffic 36-40 Holcim haul trucks and reverse alarms 33-38
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}		
30/01/19	20:49 (Evening)	60	41	39	WD: NNW WS: Calm Rain: Nil	Highway traffic 36-42 Insects 36-39 Local residential noise <36 Train 37-40 Local traffic 37-59
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<29
30/01/19	22:36 (Night)	53	32	30	WD: WNW WS: Calm Rain: Nil	Insects <30 Distant traffic 30-36 Holcim haul trucks and reverse alarms 29-32
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						31

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.

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5 Noise Compliance Assessment

The compliance assessment summary for each monitoring location N1 to N4 are presented in **Table 7** and **Table 8** for the two assessment periods.

Table 7 Round 1 Noise Compliance Assessment Summary

Location No.	Period	Quarry Contribution	Criteria	Compliant
		dB, $L_{Aeq(15min)}$	dB, $L_{Aeq(15min)}$	
N1	Evening	<23	35	✓
N2	Evening	<26	35	✓
N3	Evening	35	35	✓
N4	Evening	<29	37	✓

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.

Table 8 Round 2 Noise Compliance Assessment Summary

Location No.	Period	Quarry Contribution	Criteria	Compliant
		dB, $L_{Aeq(15min)}$	dB, $L_{Aeq(15min)}$	
N1	Night	<21	35	✓
N2	Night	34	35	✓
N3	Night	35	35	✓
N4	Night	31	37	✓

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.

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6 Discussion

6.1 Discussion of Results - Location N1

Monitoring on Wednesday 30 January 2019 identified that the quarry noise contribution remained inaudible, although contributions were calculated at between <21dBA and <23dBA respectively which satisfies the relevant noise criteria. Extraneous sources audible during the survey included insects, wind in trees, train pass by and aircraft noise.

6.2 Discussion of Results - Location N2

Quarry noise emissions were audible during the night measurement on Wednesday 30 January 2019. Quarry noise emissions were estimated to be 34dBA, satisfying the relevant noise criteria for both measurements. Audible onsite operations included haul truck movements and reverse alarms. Extraneous sources measured include insects, birds, highway traffic, dog bark and train pass by.

6.3 Discussion of Results - Location N3

Quarry noise was audible during both evening and night measurements conducted on Wednesday 30 January 2019. Quarry noise emissions were estimated to be 35dBA for each measurement respectively, therefore satisfying relevant noise limits. Audible onsite operations included haul truck movements and reverse alarms. Non-quarrying noise sources included insects, wind, birds, train pass by, and distant highway traffic.

6.4 Discussion of Results - Location N4

Quarry noise was audible during the night measurement conducted on Wednesday 30 January 2019. Quarry noise emissions were estimated to be 31dBA, therefore satisfying relevant noise limits. Audible onsite operations included haul truck movements and reverse alarms. Non-quarrying sources included highway traffic, insects, local residential noise, train pass by and local traffic.

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7 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 March 2019.

Attended noise monitoring was undertaken on Wednesday 30 January 2019 at four representative monitoring locations. The assessment has identified that noise emissions generated by Lynwood Quarry were audible during measurements at location N2, N3 and N4, however quarry noise emissions were below the relevant noise criteria. Operational noise was inaudible during all other attended noise measurements thus satisfying the applicable noise criteria.

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Appendix A - Glossary of Terms

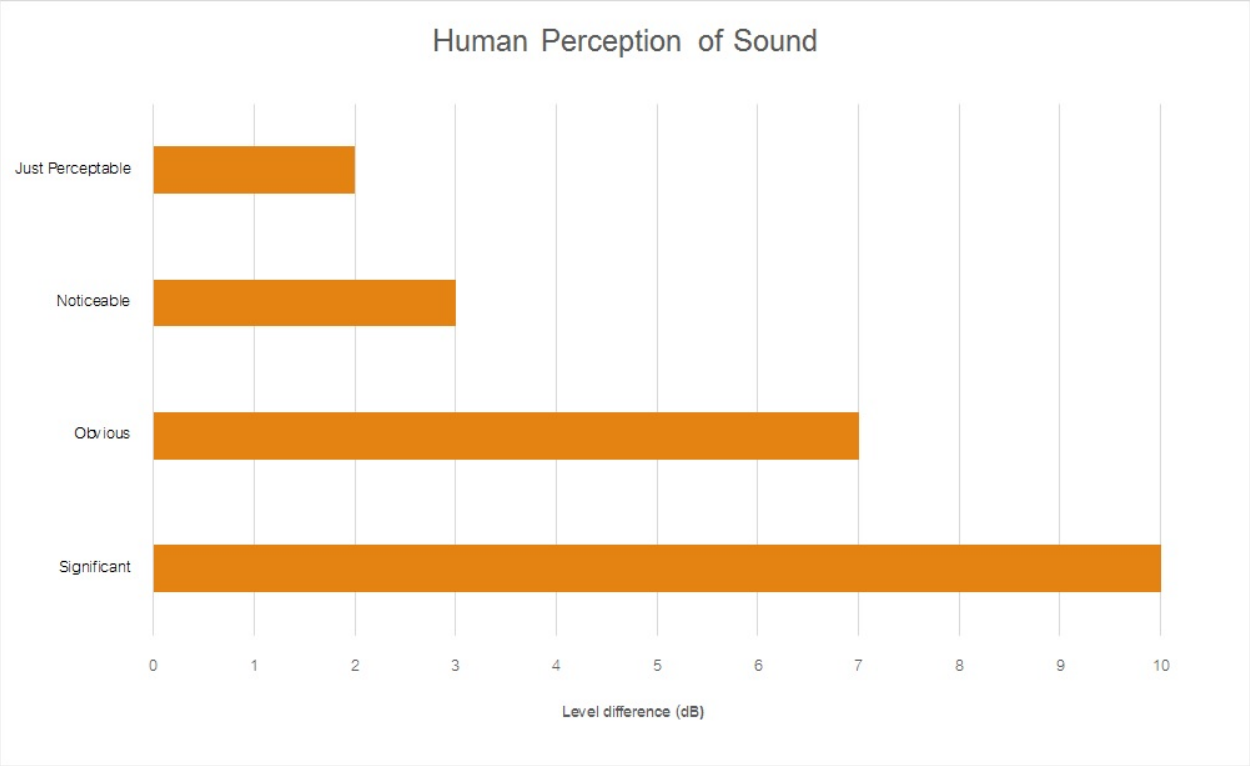
Table A1 provides a number of technical terms have been used in this report.

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



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Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW
Quarter 2 Ending June 2019.

Prepared for: Holcim (Australia) Pty Ltd
June 2019
MAC180611-02RP4

Muller Acoustic Consulting

Document Information

Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW

Quarter 2 Ending June 2019

Prepared for: Holcim (Australia) Pty Ltd

Prepared by: Muller Acoustic Consulting Pty Ltd
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Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
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CONTENTS

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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);
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- 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**.

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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, $LA_{eq(15min)}$	dB, $LA_{eq(15min)}$	dB, $LA_{eq(15min)}$	dB, $LA_{1(1min)}$
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.

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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		
			Day	Evening	Night
N1	L1	South Eastern Boundary of 1114 Carrick Road, Marulan[1]	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

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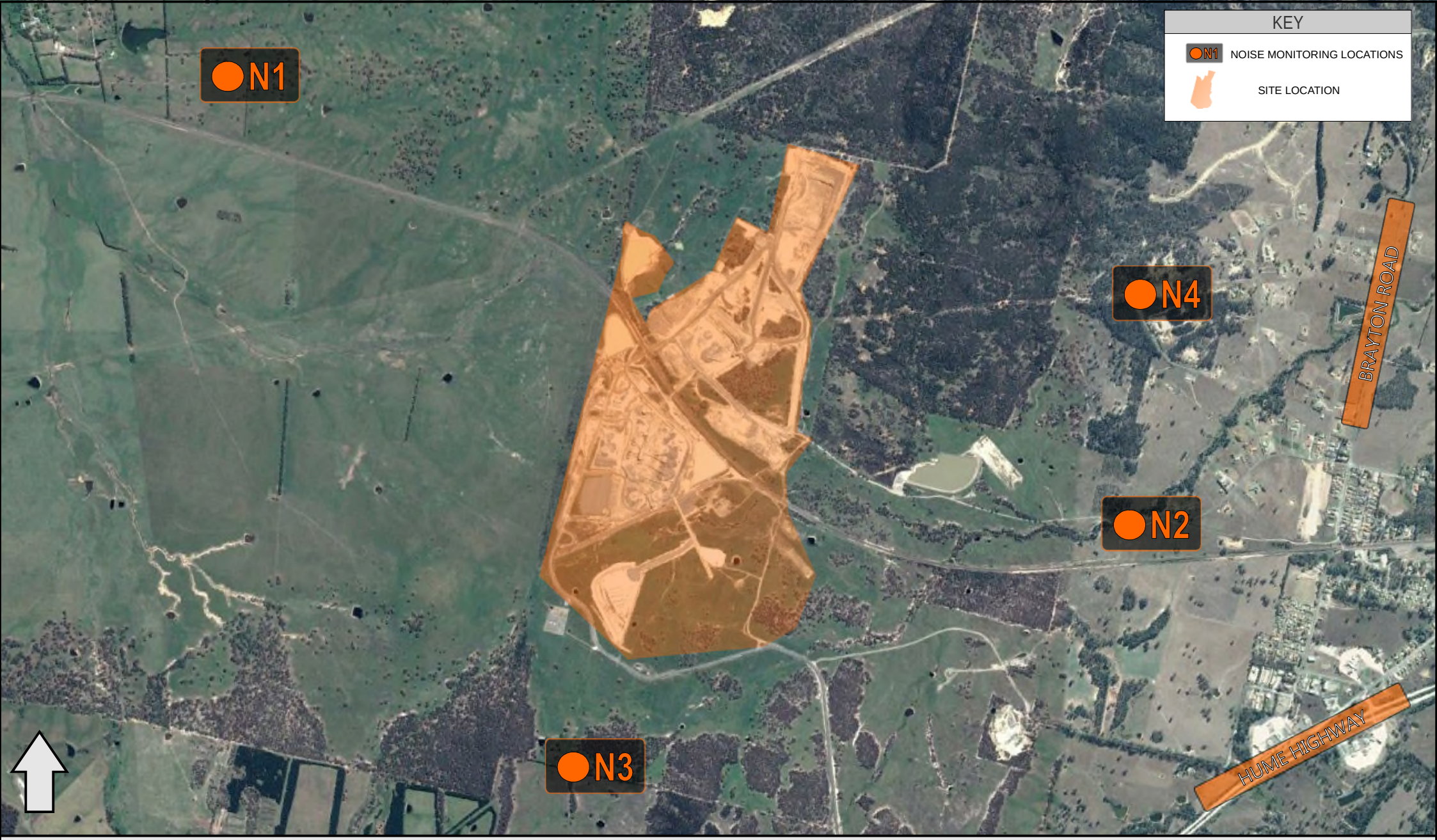
Noise measurements were of 15 minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. Measurements were conducted at four locations (N1-N4) on Wednesday 22 May 2019 and Thursday 23 May 2019 to satisfy the requirements of 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.



MAC
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FIGURE 1

LOCALITY PLAN

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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}		
22/05/19	19:07 (Evening)	47	41	39	WD: NE WS: 1m/s Rain: Nil	Highway traffic 30-40 Holcim site <35
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<35
23/05/19	08:18 (Day)	63	37	33	WD: NNW WS: <1m/s Rain: Nil	Birds 32-34 Holcim site 30-36
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}		
22/05/19	20:58 (Evening)	61	38	39	WD: NE WS: 1m/s Rain: Nil	Highway traffic 32-38 Train 30-67 Site inaudible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
23/05/19	10:10 (Day)	69	40	31	WD: NW WS: 1m/s Rain: Nil	Birds 33-36 Highway traffic 28-30 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}		
22/05/19	21:55 (Evening)	67	40	25	WD: NE WS: 1m/s Rain: Nil	Train 40-58 Holcim haul truck 33 Holcim site noise 26-33
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						29
23/05/19	09:15 (Day)	49	39	37	WD: NW WS: <1m/s Rain: Nil	Livestock 36-45 Train 40-63 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.

4.4 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}		
22/05/19	20:36 (Evening)	77	52	38	WD: NE WS: 1m/s Rain: Nil	Highway traffic 32-38 Local car 80 Dogs 42 Site inaudible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
23/05/19	09:48 (Day)	53	32	30	WD: NNW WS: 1m/s Rain: Nil	Birds 30-34 Distant traffic <30 Site inaudible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<20

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 Noise Compliance Assessment

The compliance assessment summary for each monitoring location N1 to N4 are presented in **Table 7** and **Table 8** for the two assessment periods.

Table 7 Round 1 Noise Compliance Assessment Summary

Location No.	Period	Quarry Contribution	Criteria	Compliant
		dB, $L_{Aeq(15min)}$	dB, $L_{Aeq(15min)}$	
N1	Evening	<35	35	✓
N2	Evening	<30	37	✓
N3	Evening	29	35	✓
N4	Evening	<30	37	✓

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.

Table 8 Round 2 Noise Compliance Assessment Summary

Location No.	Period	Quarry Contribution	Criteria	Compliant
		dB, $L_{Aeq(15min)}$	dB, $L_{Aeq(15min)}$	
N1	Day	<35	35	✓
N2	Day	<30	35	✓
N3	Day	<30	35	✓
N4	Day	<20	37	✓

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.

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6 Discussion

6.1 Discussion of Results - Location N1

Monitoring on Wednesday 22 May 2019 and Thursday 23 May 2019 identified that the quarry noise contribution was audible throughout the survey, although contributions were calculated below 35dBA which satisfies the relevant noise criteria. Extraneous sources audible during the survey included traffic and birds.

6.2 Discussion of Results - Location N2

Quarry noise emissions were inaudible during the measurements on Wednesday 22 May 2019 and Thursday 23 May 2019. Quarry noise emissions were estimated to be <30dBA for the evening period and <30dBA for the day period, satisfying the relevant noise criteria for both measurements. Extraneous sources measured include highway traffic, train pass by and birds.

6.3 Discussion of Results - Location N3

Quarry noise was audible during the evening measurement conducted on Wednesday 22 May 2019 and however remained inaudible during the daytime measurement on Thursday 23 May 2019. Quarry noise emissions were estimated to be <30dBA for each measurement respectively, therefore satisfying relevant noise limits. Audible onsite operations included haul truck movements and reverse alarms. Non-quarrying noise sources included train pass by and livestock.

6.4 Discussion of Results - Location N4

Quarry noise was inaudible during the measurements conducted on Wednesday 22 May 2019 and Thursday 23 May 2019. Quarry noise emissions were estimated to be <30dBA, therefore satisfying relevant noise limits. Non-quarrying sources included birds, highway traffic, local residential noise, and local traffic.

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7 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 June 2019.

Attended noise monitoring was undertaken on Wednesday 22 May 2019 and Thursday 23 May 2019 at four representative monitoring locations. The assessment has identified that noise emissions generated by Lynwood Quarry were audible during both evening and daytime measurements at location N1 and during the evening measurement at N3, however quarry noise emissions were below the relevant noise criteria. Operational noise was inaudible during all other attended noise measurements thus satisfying the applicable noise criteria.

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Appendix A - Glossary of Terms

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

Table A1 Glossary of Terms

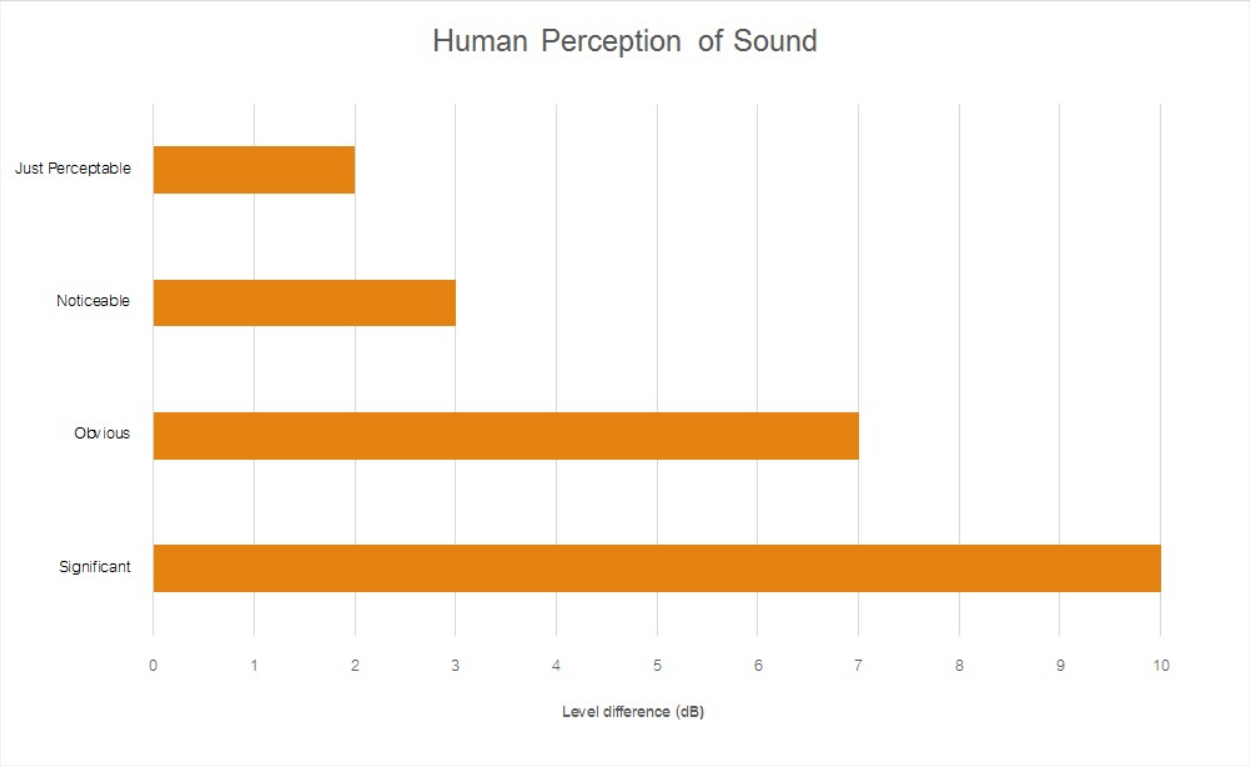
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for 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



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Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW
Quarter 3 Ending September 2019.

Prepared for: Holcim (Australia) Pty Ltd
September 2019
MAC180611-02RP5

Muller Acoustic Consulting

Document Information

Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW

Quarter 3 Ending September 2019

Prepared for: Holcim (Australia) Pty Ltd

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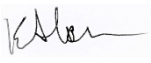
MAC180611-02RP5	Final	16 September 2019	Kristian Allen		Rod Linnett	

CONTENTS

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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 2019, 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**.

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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, $L_{Aeq(15min)}$	dB, $L_{Aeq(15min)}$	dB, $L_{Aeq(15min)}$	dB, $L_{A1(1min)}$
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.

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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		
			Day	Evening	Night
N1	L1	South Eastern Boundary of 1114 Carrick Road, Marulan[1]	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 10 September 2019 and Wednesday 11 September 2019. 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 10 September 2019 and Wednesday 11 September 2019 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.

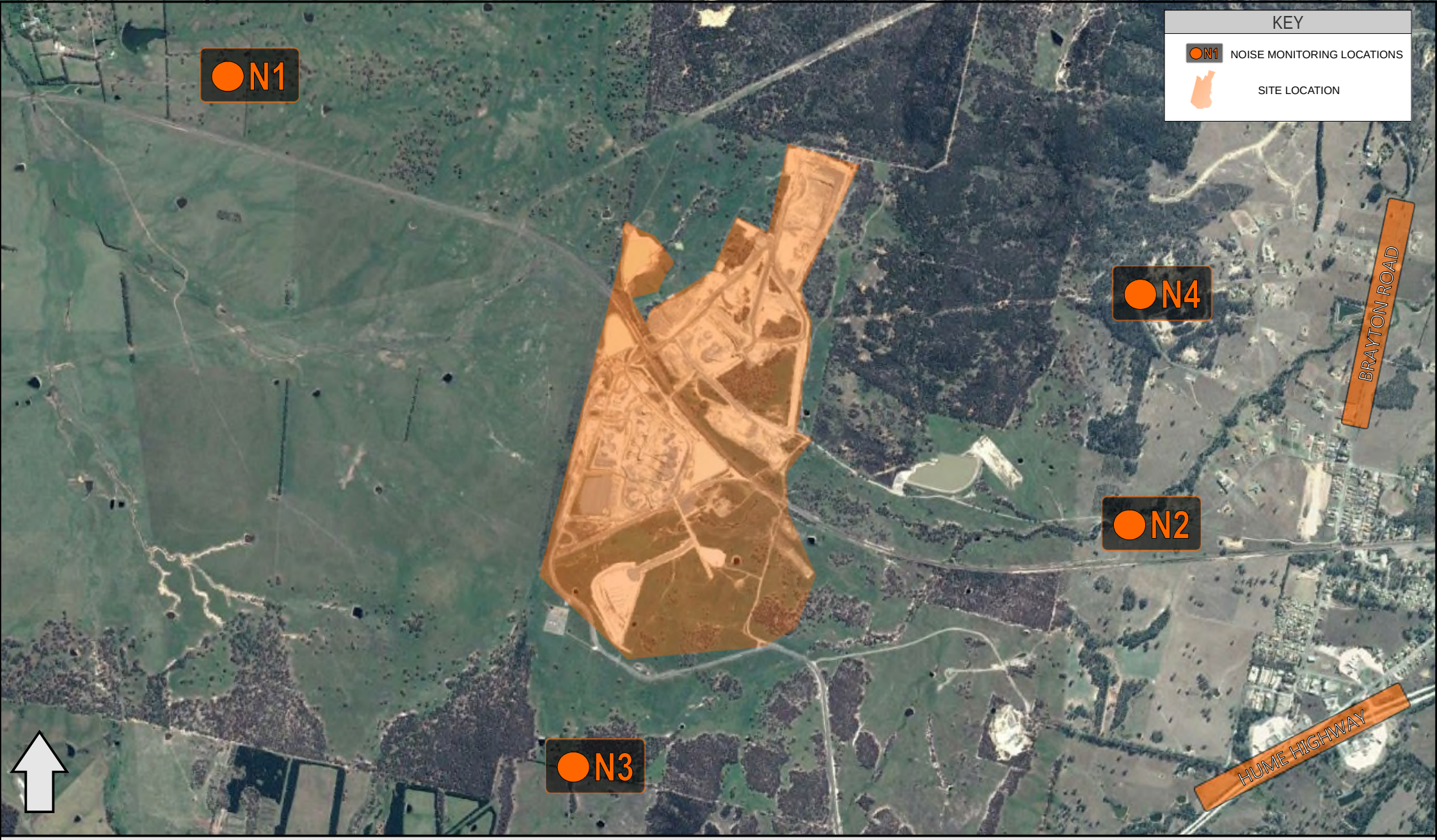

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FIGURE 1

LOCALITY PLAN

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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}		
10/09/2019	17:48 (Day)	60	40	34	WD: SE WS: 2-3m/s Rain: Nil	Highway Traffic 33-38 Wind 36-44 Livestock 33-44 Birds 33-60 Holcim Site 36-44
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
11/09/2019	05:52 (Night)	57	41	35	WD: W WS: <0.1m/s Rain: Nil	Livestock 30-36 Birds 34-56 Quarry (not site) 37-45 Holcim 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}		
10/09/2019	16:49 (Day)	57	44	41	WD: SE WS: 1-2m/s Rain: Nil	Highway traffic 38-45 Birds 38-45 Wind 38-45 Aircraft 42-57 Holcim Not Audible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
11/09/2019	06:48 (Night)	75	56	42	WD: N WS: <0.2m/s Rain: Nil	Birds to 48 Highway Traffic 42-46 Train 42-76 Holcim 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}		
10/09/2019	16:12 (Day)	61	41	31	WD: SE WS: 1-2m/s Rain: Nil	Highway Traffic 30-39 Birds 30-39 Aircraft 30-62 Local Traffic 32-38 Holcim Not Audible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<25
11/09/2019	05:00 (Night)	65	47	42	WD: W WS: <0.1m/s Rain: Nil	Highway Traffic 40-46 Train 38-44 Birds 43-48 Local Traffic 44-56 Holcim Reverse Alarms 44-46 Holcim Loading/Alarms 42-46
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}		
10/09/2019	17:12 (Day)	58	42	37	WD: SE WS: 2-3m/s Rain: Nil	Highway Traffic 37-40 Wind 37-43 Aircraft 40-58 Birds 37-52 Holcim Not Audible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
11/09/2019	06:27 (Night)	64	45	37	WD: SW WS: <0.1m/s Rain: Nil	Birds 36-59 Highway Traffic 36-44 Holcim 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 Noise Compliance Assessment

The compliance assessment summary for each monitoring location N1 to N4 are presented in **Table 7** and **Table 8** for the two assessment periods.

Table 7 Round 1 Noise Compliance Assessment Summary

Location No.	Period	Quarry Contribution	Criteria	Compliant
		dB, $L_{Aeq(15min)}$	dB, $L_{Aeq(15min)}$	
N1	Day	<30	35	✓
N2	Day	<30	37	✓
N3	Day	<25	35	✓
N4	Day	<30	37	✓

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.

Table 8 Round 2 Noise Compliance Assessment Summary

Location No.	Period	Quarry Contribution	Criteria	Compliant
		dB, $L_{Aeq(15min)}$	dB, $L_{Aeq(15min)}$	
N1	Night	<30	35	✓
N2	Night	<35	35	✓
N3	Night	<35	35	✓
N4	Night	<30	37	✓

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.

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6 Discussion

6.1 Discussion of Results - Location N1

Monitoring on Tuesday 10 September 2019 identified that the quarry noise was audible during the daytime survey with contributions below 30dBA. On Wednesday 11 September 2019 quarry noise was inaudible during the night-time period with noise emissions estimated to be <30dBA, therefore satisfying the relevant noise criteria for both periods. Quarry noise sources audible during the survey included loading activities and extraneous sources included wind, highway traffic, livestock, and birds.

6.2 Discussion of Results - Location N2

Quarry noise emissions were inaudible during the measurements on Tuesday 10 September 2019 and Wednesday 11 September 2019. Quarry noise emissions were estimated to be <30dBA for the daytime period and <35dBA for the night-time period, therefore satisfying the relevant noise criteria for both periods. Extraneous sources measured include train, wind, highway traffic, aircraft and birds.

6.3 Discussion of Results - Location N3

Quarry noise was inaudible during measurements on Tuesday 10 September 2019 with quarry noise emissions estimated to be <25dBA. Quarry noise was audible on Wednesday 10 September 2019 night-time period measurement with contributions estimated to be <35dBA, therefore satisfying relevant noise criteria for both periods. Quarry noise sources audible during the survey included loading activities and reverse alarms. Extraneous noise sources included train pass by, aircraft noise, birds, highway and local traffic.

6.4 Discussion of Results - Location N4

Quarry noise was inaudible during the measurements conducted on Tuesday 10 September 2019 and Wednesday 11 September 2019. Quarry noise emissions were estimated to be <30dBA for both daytime and night-time periods, therefore satisfying relevant noise criteria for both measurements. Non-quarrying sources included birds, highway traffic, wind and aircraft.

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7 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 September 2019.

Attended noise monitoring was undertaken on Tuesday 10 September 2019 and Wednesday 11 September 2019 at four representative monitoring locations. The assessment has identified that noise emissions generated by Lynwood Quarry were audible during daytime measurements at location N1 and during the night-time measurement at N3, however quarry noise emissions were below the relevant noise criteria. Operational noise was inaudible during all other attended noise measurements, satisfying the applicable noise criteria.

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Appendix A - Glossary of Terms

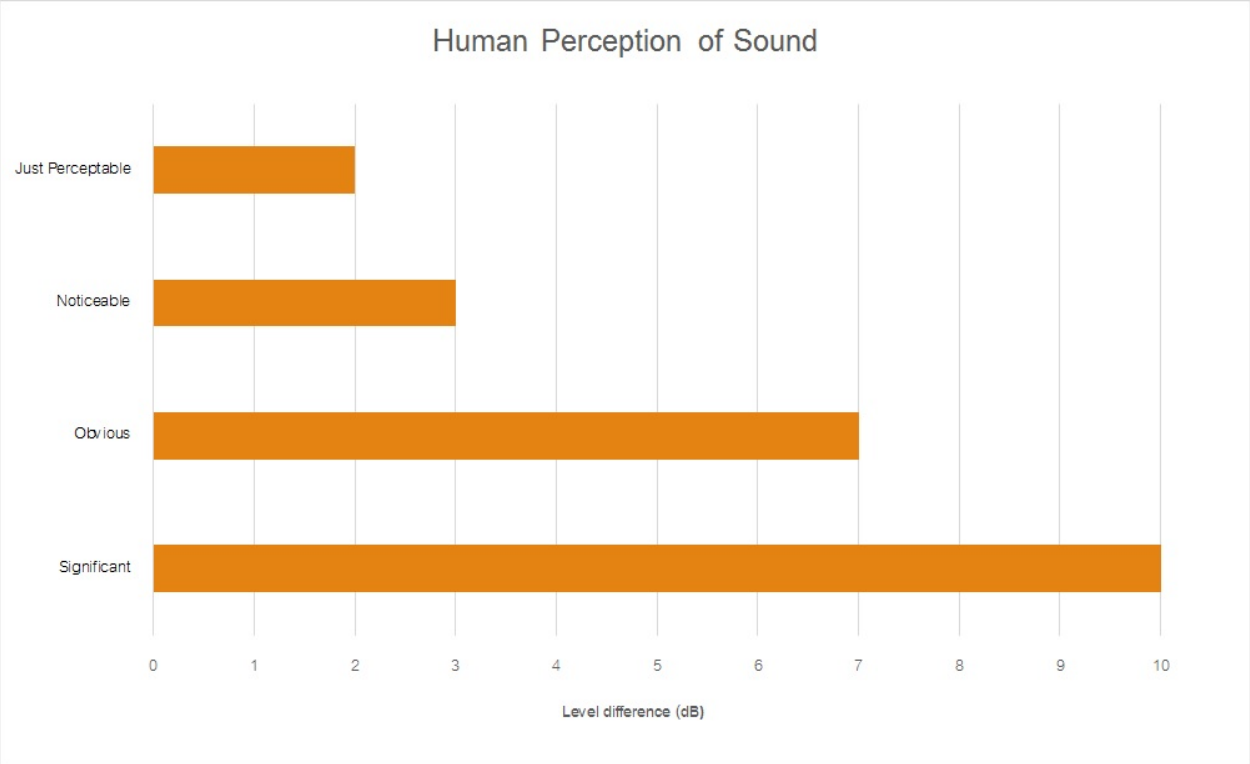
Table A1 provides a number of technical terms have been used in this report.

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



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Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW
Quarter 4 Ending December 2019.

Prepared for: Holcim (Australia) Pty Ltd
November 2019
MAC180611-02RP6

Muller Acoustic Consulting

Document Information

Noise Monitoring Assessment

Lynwood Quarry, Marulan, NSW

Quarter 4 Ending December 2019

Prepared for: Holcim (Australia) Pty Ltd

Prepared by: Muller Acoustic Consulting Pty Ltd
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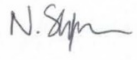
Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
MAC180611-02RP6	Final	25 November 2019	Nicholas Shipman		Rod Linnett	

CONTENTS

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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 2019, 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**.

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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.

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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		
			Day	Evening	Night
N1	L1	South Eastern Boundary of 1114 Carrick Road, Marulan[1]	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 19 November 2019 and Thursday 21 November 2019. 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 19 November 2019 and Thursday 21 November 2019 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.

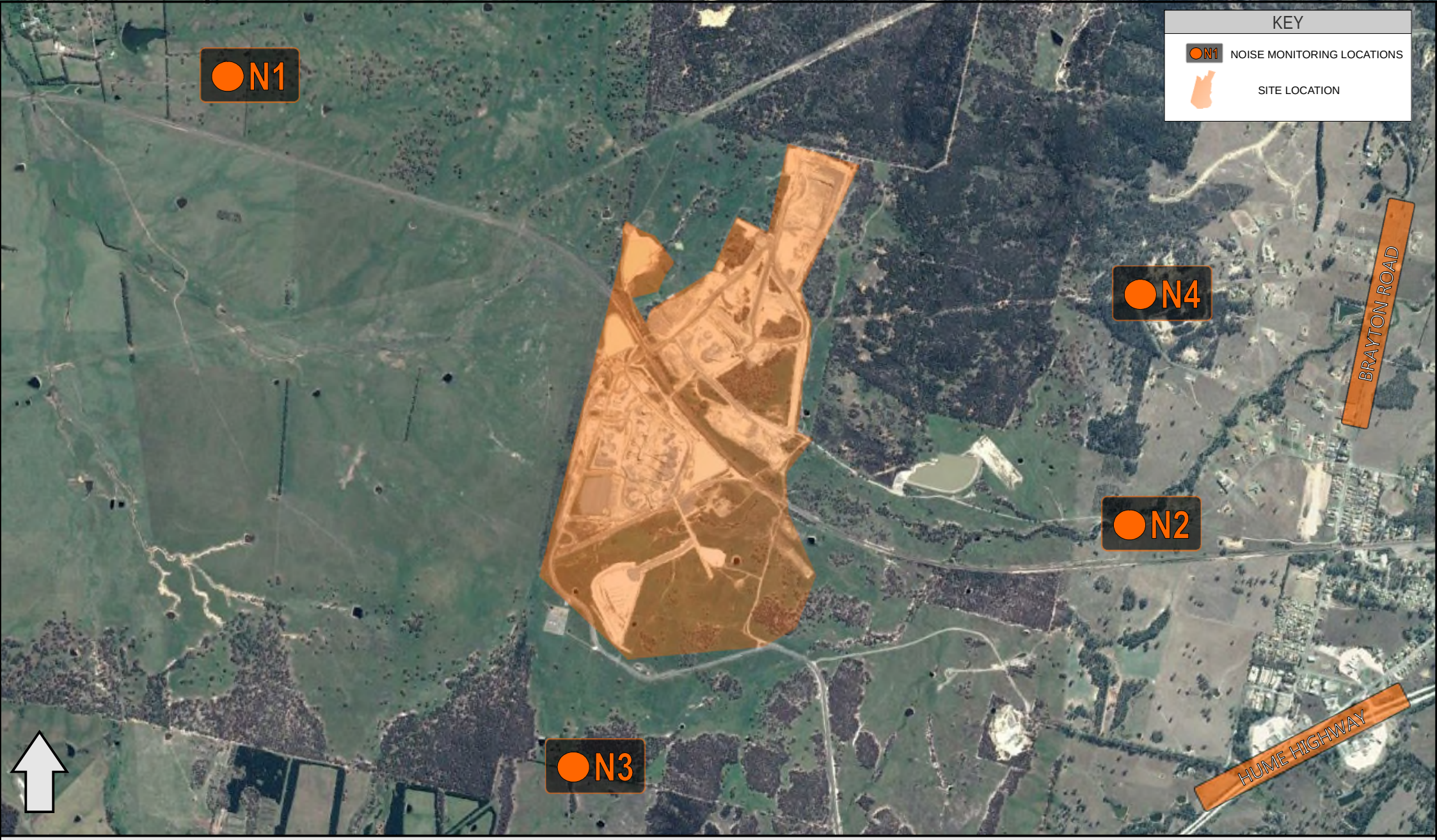

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FIGURE 1

LOCALITY PLAN

REF: MAC180611-02

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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}		
19/11/2019	15:51 (Day)	64	49	43	WD: W WS: 3m/s Rain: Nil	Wind 38-56 Birds 40-45 Aircraft <45 Holcim Site Inaudible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
21/11/2019	11:07 (Day)	65	50	43	WD: NW WS: 2m/s Rain: Nil	Wind 40-61 Livestock 45-51 Birds 41-45 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}		
19/11/2019	14:43 (Day)	72	47	42	WD: W WS: 2.5m/s Rain: Nil	Wind 39-55 Birds <40 Aircraft 40-45 Holcim Site Inaudible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
21/11/2019	10:05 (Day)	53	38	34	WD: N WS: 1.5m/s Rain: Nil	Wind 34-43 Birds 40-42 Insects <38 Aircraft 37-44 Holcim Site Vehicle <33
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<33

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}		
19/11/2019	16:58 (Day)	67	46	38	WD: W WS: 2.5m/s Rain: Nil	Wind 37-50 Birds 44-50 Traffic <40 Aircraft <40 Holcim Site Vehicle <35
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<35
21/11/2019	09:17 (Day)	56	43	39	WD: N WS: 2m/s Rain: Nil	Birds 40-45 Wind 40-53 Aircraft 42-55 Traffic 38-44 Holcim Site Vehicles <36 Holcim Site Hum 34-36
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}		
19/11/2019	15:07 (Day)	73	53	42	WD: NW WS: 2.8m/s Rain: Nil	Wind 40-62 Birds 40-46 Traffic 45-64 Holcim Site Inaudible
Lynwood Quarry $L_{Aeq(15min)}$ Contribution						<30
21/11/2019	10:27 (Day)	65	41	38	WD: NW WS: 1.6m/s Rain: Nil	Wind 36-47 Birds 36-41 Traffic 36-38 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 19 November 2019 and Thursday 21 November 2019 identified that the quarry noise was inaudible during both daytime surveys with contributions estimated to be below 30dBA on both occasions therefore, satisfying the relevant noise criteria for both periods. Extraneous sources included wind, birds, aircraft, and livestock.

5.2 Discussion of Results - Location N2

Quarry noise emissions were inaudible on the Tuesday 19 November 2019 and therefore the quarry contribution was estimated to be <30dBA. Quarry noise emissions were audible on Thursday 21 November 2019 with Holcim site vehicles measured at <33dBA during the measurement, therefore satisfying the relevant noise criteria for both measurements. Extraneous sources measured included wind, birds, aircraft and insects.

5.3 Discussion of Results - Location N3

Quarry noise was audible during measurements on Tuesday 19 November 2019 and Thursday 21 November 2019 with quarry noise emissions estimated to be 35dBA, or less, therefore satisfying relevant noise criteria for both periods. Quarry noise sources audible during the survey included Holcim site vehicles and quarry hum. Extraneous noise sources included wind, birds, traffic and aircraft noise.

5.4 Discussion of Results - Location N4

Quarry noise was inaudible during the measurements conducted on Tuesday 19 November 2019 and Thursday 21 November 2019. Quarry noise emissions were estimated to be <30dBA for both daytime periods, therefore satisfying relevant noise criteria for both measurements. Non-quarrying sources included wind, birds and traffic.

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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 2019).

Attended noise monitoring was undertaken on Tuesday 19 November 2019 and Thursday 21 November 2019 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.

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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
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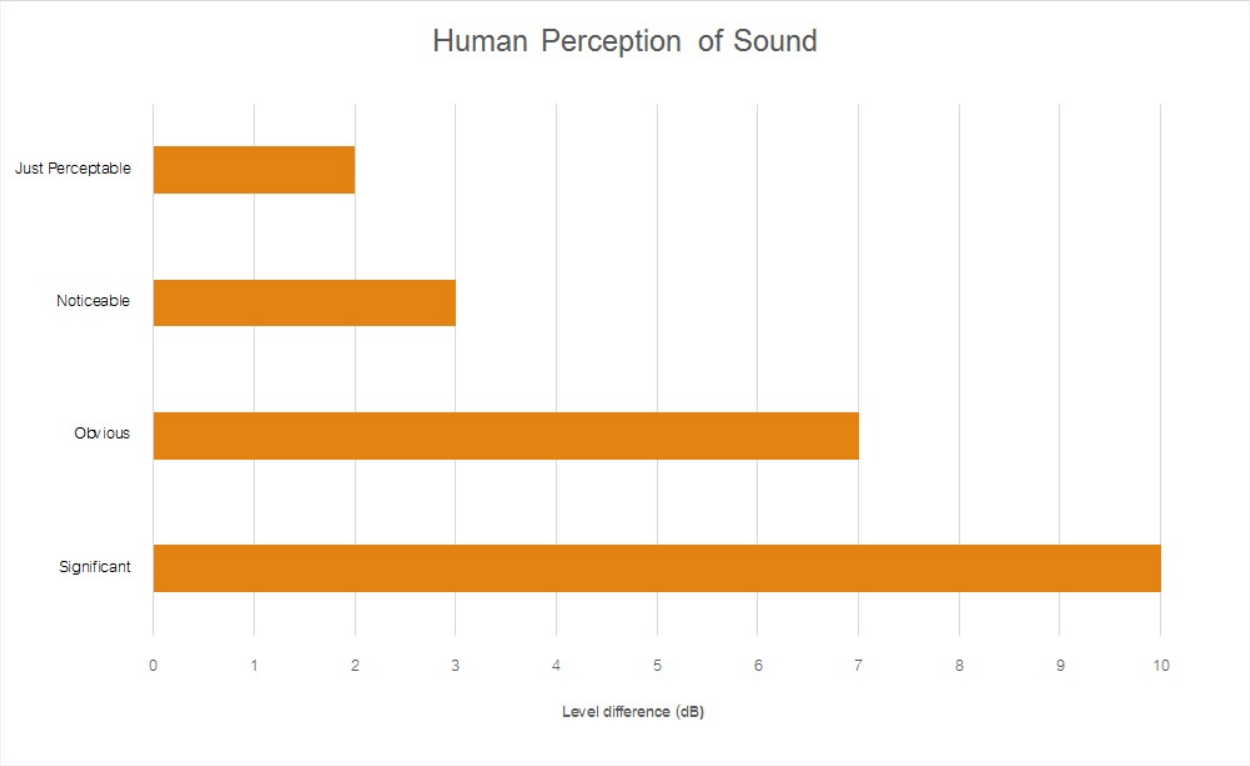
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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APPENDIX 2
Environmental Monitoring Results

PM_{10} Monitoring Results

Date	HVAS 1			HVAS 2		
	PM10 Results	Run Hours	Compliant with Run Time	PM10 Results	Run Hours	Compliant with Run Time
2/1/2019	21	21	N	-	-	-
8/1/2019	9.1	14.1	N	-	-	-
14/1/2019	17.7	19.1	N	-	-	-
20/1/2019	14.2	15.7	N	-	-	-
26/1/2019	55.2	19	N	-	-	-
1/2/2019	1	10.6	N	3.8	24	Y
7/2/2019	6.5	17.7	N	7.8	25.8	Y
13/2/2019	16.5	20.6	N	28.2	22.1	N
19/2/2019	41.4	17.4	N	23.4	24	Y
25/2/2019	24.1	15.9	N	20	24	Y
3/3/2019	17.7	16.5	N	15.2	24	Y
9/3/2019	31.2	11.9	N	22.4	24	Y
15/3/2019	16.2	12.9	N	14.2	24	Y
21/3/2019	5.8	12.2	N	5.6	24	Y
27/3/2019	13.4	13	N	15.6	24	Y
2/4/2019	8.2	13.8	N	6.56	24	Y
8/4/2019	29.3	14.8	N	31.3	23.1	Y
14/4/2019	19.2	12.7	N	16.8	24	Y
20/4/2019	14.6	12.7	N	16.3	24	Y
26/4/2019	32	13.2	N	41	24	Y
2/5/2019	10.2	8.6	N	14.8	24	Y
8/5/2019	1.0	9.1	N	5.5	24	Y
14/5/2019	2.8	11.1	N	13.4	24	Y
20/5/2019	13.9	8.3	N	13.5	24	Y
26/5/2019	4.0	10.1	N	5.5	24	Y
1/6/2019	2.1	10.6	N	8	24	Y
7-6-2019	3.6	9.4	N	6.4	24	Y
13/6/2019	1.0	6.9	N	4.8	24	Y
19/6/2019	1.0	10	N	3.2	24	Y
25/6/2019	1.0	6.8	N	1.1	24	Y
1/7/2019	3.6	20.7	N	7.9	24	Y
7/7/2019	1.0	21.8	N	4.3	24	Y
13/7/2019	2.6	24	N	3.6	24	Y
19/7/2019	1.9	22.1	N	5.7	24	Y
25/7/2019	13.9	23.7	N	11.7	24	Y
31/7/2019	8.2	22.5	N	9.9	24	Y
6/8/2019	2.9	24	Y	7.5	24	Y
14/8/2019	1.0	24	Y	3.7	24	Y
18/8/2019	8.0	24	Y	10.4	24	Y
24/8/2019	11.4	24	Y	15.1	24	Y
30/8/2019	3.5	24	Y	3.1	24	Y
5/9/2019	5.4	24	Y	10.2	24	Y
11/9/2019	9.6	24	Y	10.4	24	Y
17/9/2019	1.9	17.8	N	1.8	24	Y
23/9/2019	3.7	24	Y	9.8	24	Y
29/9/2019	7.3	24	Y	9.9	24.1	Y
5/10/2019	4.7	21.2	N	4.8	24	Y

11/10/2019	3.5	22.5	N	2.9	24	Y
17/10/2019	8.1	24	Y	17	24	Y
23/10/2019	18.1	24	Y	22.6	24	Y
29/10/2019	26.6	24	Y	15.5	24	Y
4/11/2019	5.6	24	Y	9.8	24	Y
10/11/2019	7.8	24	Y	7.8	24	Y
16/11/2019	13.4	24	Y	15.5	24	Y
22/11/2019	63.4	24	Y	42.6	24	Y
28/11/2019	31.2	-	-	42.6	-	-
4/12/2019	14.3	24	Y	49.2	24	Y
10/12/2019	154	24	Y	155	24	Y
16/12/2019	59.4	24	Y	52.6	24	Y
22/12/2019	81.2	22.25	N	72	24	Y
28/12/2019	113	24	Y	114	24	Y

Bold – exceedance of short-term criteria (50 $\mu g/m^3$)

Surface Water Monitoring Results

SW5

Date	Electrical Conductivity µS/cm	pH	Suspended Solids mg/L	Total Oil & Grease mg/L	P mg/L	N mg/L	Flow Observations
January	Dry	Dry	Dry	Dry	Dry	Dry	NF
February	Dry	Dry	Dry	Dry	Dry	Dry	NF
March	Dry	Dry	Dry	Dry	Dry	Dry	NF
April	Dry	Dry	Dry	Dry	Dry	Dry	NF
May	Dry	Dry	Dry	Dry	Dry	Dry	NF
June	536	7	9	1	0.04	0.86	F
July	1000	7.44	5	1	0.02	0.71	F
August	Dry	Dry	Dry	Dry	Dry	Dry	NF
September	684	6.81	17	1	0.63	1.32	F
October	902	7.48	5	1	0.04	0.94	NF
November	dry	dry	dry	dry	dry	dry	NF
December	Dry	Dry	Dry	Dry	Dry	Dry	NF

F – Flow, NF – No Flow

SW6

Date	Electrical Conductivity µS/cm	pH	Suspended Solids mg/L	Total Oil & Grease mg/L	P mg/L	N mg/L	Flow Observations
January	897	7.6	6	1	0.12	1.47	F
February	1450	7.5	36	0.9	0.03	0.96	F
March	1810	7.6	7	1	0.03	0.88	F
April	1510	6.7	5	1	0.02	0.82	F
May	1120	7.4	5	1	0.89	0.04	F
June	533	7	43	1	0.1	1.21	F
July	688	7.2	9	1	0.04	0.84	F
August	746	7.67	5	1	0.02	0.66	F
September	532	7.01	21	1	0.16	1.52	F
October	707	7.26	2	1	0.03	0.74	F
November	954	7.79	4	1	0.02	0.67	F
December	163	7.58	11	1	0.02	0.69	F

F – Flow, NF – No Flow

SW8

Date	Electrical Conductivity µS/cm	pH	Suspended Solids mg/L	Total Oil & Grease mg/L	P mg/L	N mg/L	Flow Observations
January	Dry	Dry	Dry	Dry	Dry	Dry	NF
February	Dry	Dry	Dry	Dry	Dry	Dry	NF
March	Dry	Dry	Dry	Dry	Dry	Dry	NF
April	Dry	Dry	Dry	Dry	Dry	Dry	NF
May	Dry	Dry	Dry	Dry	Dry	Dry	NF
June	Dry	Dry	Dry	Dry	Dry	Dry	NF
July	380	7.8	16	<1	0.08	1.89	F
August	Dry	Dry	Dry	Dry	Dry	Dry	NF

September	Dry	Dry	Dry	Dry	Dry	Dry	NF
October	Dry	Dry	Dry	Dry	Dry	Dry	NF
November	Dry	Dry	Dry	Dry	Dry	Dry	NF
December	Dry	Dry	Dry	Dry	Dry	Dry	NF

F – Flow, NF – No Flow

SW9

Date	Electrical Conductivity µS/cm	pH	Suspended Solids mg/L	Total Oil & Grease mg/L	P mg/L	N mg/L	Flow Observations
January	Dry	Dry	Dry	Dry	Dry	Dry	NF
February	Dry	Dry	Dry	Dry	Dry	Dry	NF
March	Dry	Dry	Dry	Dry	Dry	Dry	NF
April	Dry	Dry	Dry	Dry	Dry	Dry	NF
May	Dry	Dry	Dry	Dry	Dry	Dry	NF
June	Dry	Dry	Dry	Dry	Dry	Dry	NF
July	Dry	Dry	Dry	Dry	Dry	Dry	NF
August	Dry	Dry	Dry	Dry	Dry	Dry	NF
September	Dry	Dry	Dry	Dry	Dry	Dry	NF
October	Dry	Dry	Dry	Dry	Dry	Dry	NF
November	Dry	Dry	Dry	Dry	Dry	Dry	NF
December	Dry	Dry	Dry	Dry	Dry	Dry	NF

F – Flow, NF – No Flow

SW10

Date	Electrical Conductivity µS/cm	pH	Suspended Solids mg/L	Total Oil & Grease mg/L	P mg/L	N mg/L	Flow Observations
January	Dry	Dry	Dry	Dry	Dry	Dry	NF
February	Dry	Dry	Dry	Dry	Dry	Dry	NF
March	Dry	Dry	Dry	Dry	Dry	Dry	NF
April	Dry	Dry	Dry	Dry	Dry	Dry	NF
May	Dry	Dry	Dry	Dry	Dry	Dry	NF
June	Dry	Dry	Dry	Dry	Dry	Dry	NF
July	Dry	Dry	Dry	Dry	Dry	Dry	NF
August	Dry	Dry	Dry	Dry	Dry	Dry	NF
September	Dry	Dry	Dry	Dry	Dry	Dry	NF
October	Dry	Dry	Dry	Dry	Dry	Dry	NF
November	Dry	Dry	Dry	Dry	Dry	Dry	NF
December	Dry	Dry	Dry	Dry	Dry	Dry	NF

F – Flow, NF – No Flow

SW11

Date	Electrical Conductivity µS/cm	pH	Suspended Solids mg/L	Total Oil & Grease mg/L	P mg/L	N mg/L	Flow Observations
January	Dry	Dry	Dry	Dry	Dry	Dry	NF
February	Dry	Dry	Dry	Dry	Dry	Dry	NF
March	Dry	Dry	Dry	Dry	Dry	Dry	NF
April	Dry	Dry	Dry	Dry	Dry	Dry	NF

May	Dry	Dry	Dry	Dry	Dry	Dry	NF
June	Dry	Dry	Dry	Dry	Dry	Dry	NF
July	Dry	Dry	Dry	Dry	Dry	Dry	NF
August	Dry	Dry	Dry	Dry	Dry	Dry	NF
September	Dry	Dry	Dry	Dry	Dry	Dry	NF
October	Dry	Dry	Dry	Dry	Dry	Dry	NF
November	Dry	Dry	Dry	Dry	Dry	Dry	NF
December	Dry	Dry	Dry	Dry	Dry	Dry	NF

F – Flow, NF – No Flow

Groundwater Monitoring Results

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
Depth to Water Level (m)					
MP1	Meters	2.0	2.2	2.3	2.4
MP2	Meters	6.1	16.2	15.3	16.4
MP4	Meters	19.8	20.0	20.2	20.7
MP5	Meters	20.7	20.9	21.0	20.5
MP7	Meters	17.1	17.8	n/a	n/a
MP10	Meters	5.5	5.7	5.9	6.0
MP11	Meters	12.6	12.7	12.8	13.0
GPZ1	Meters	11.2	11.3	10.9	11.6
GPZ2	Meters	13.0	20.1	23.9	n/a
GPZ5	Meters	7.2	7.4	n/a	7.8
GPZ6	Meters	6.1	6.2	6.2	6.3
GPZ8	Meters	8.9	9.0	8.9	9.3
pH					
MP1	ph Units	6.3	6.2	6.3	6.3
MP2	ph Units	5.4	5.7	5.8	5.9
MP4	ph Units	6.3	6.2	6.4	6.3
MP5	ph Units	6.5	6.4	6.6	6.6
MP7	ph Units	6.3	6.1	n/a	n/a
MP10	ph Units	6.4	6.4	6.6	6.6
MP11	ph Units	6.9	6.7	7.0	6.9
GPZ1	ph Units	7.4	7.4	7.5	7.5
GPZ2	ph Units	6.8	6.4	6.7	n/a
GPZ5	ph Units	7.5	7.5	n/a	7.7
GPZ6	ph Units	6.9	7.0	6.8	6.9
GPZ8	ph Units	6.6	6.8	6.7	6.9
EC					
MP1	µS/cm	1120	1130	1090	1090
MP2	µS/cm	430	413	321	396
MP4	µS/cm	459	457	445	438
MP5	µS/cm	856	861	830	833
MP7	µS/cm	5620	8090	n/a	n/a
MP10	µS/cm	7130	7580	7010	7050
MP11	µS/cm	695	692	671	675
GPZ1	µS/cm	1010	984	942	937
GPZ2	µS/cm	3140	4470	3800	n/a
GPZ5	µS/cm	3740	3860	n/a	3650

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
GPZ6	µS/cm	1870	1710	1800	1780
GPZ8	µS/cm	2470	2480	2200	2120
Total Dissolved Solids (TDS)					
MP1	mg/L	669	604	623	637
MP2	mg/L	62	228	241	257
MP4	mg/L	286	220	292	282
MP5	mg/L	584	498	545	526
MP7	mg/L	5000	4640	n/a	n/a
MP10	mg/L	5160	4480	4670	4230
MP11	mg/L	449	409	431	425
GPZ1	mg/L	566	542	554	533
GPZ2	mg/L	2670	2550	2420	n/a
GPZ5	mg/L	2070	2020	n/a	2040
GPZ6	mg/L	1060	1000	1080	988
GPZ8	mg/L	1720	1330	1490	1400
Ammonia as N					
MP1	mg/L	<0.1	<0.1	<0.1	<0.1
MP2	mg/L	<0.1	<0.1	<0.1	<0.1
MP4	mg/L	<0.1	<0.1	<0.1	<0.1
MP5	mg/L	0.4	0.4	0.5	0.4
MP7	mg/L	<0.1	<0.1	n/a	n/a
MP10	mg/L	<0.1	<0.1	<0.1	<0.1
MP11	mg/L	0.2	0.1	0.2	0.2
GPZ1	mg/L	0.2	0.2	0.2	<0.1
GPZ2	mg/L	<0.1	<0.1	0.2	n/a
GPZ5	mg/L	0.6	0.7	n/a	0.5
GPZ6	mg/L	<0.1	<0.1	<0.1	<0.1
GPZ8	mg/L	1.5	1.6	1.6	1.4
Bicarbonate as CaCO3					
MP1	mg/L	190	162	188	165
MP2	mg/L	31	36	40	42
MP4	mg/L	134	125	148	124
MP5	mg/L	208	193	221	196
MP7	mg/L	325	292	n/a	n/a
MP10	mg/L	339	306	304	301
MP11	mg/L	360	321	316	322
GPZ1	mg/L	383	334	330	330
GPZ2	mg/L	414	431	412	n/a
GPZ5	mg/L	753	670	n/a	675
GPZ6	mg/L	500	420	445	448

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
GPZ8	mg/L	418	370	362	356
Calcium (Filtered)					
MP1	mg/L	39	39	36.7	37
MP2	mg/L	7	7	5.7	6
MP4	mg/L	14	14	13.6	12
MP5	mg/L	74	70	74.1	75
MP7	mg/L	428	696	n/a	n/a
MP10	mg/L	326	322	324.0	337
MP11	mg/L	109	103	101.0	108
GPZ1	mg/L	77	72	73.0	77
GPZ2	mg/L	153	197	182.0	n/a
GPZ5	mg/L	31	31	n/a	28
GPZ6	mg/L	106	106	104.0	110
GPZ8	mg/L	175	172	168.0	173
Carbonate as CaCO3					
MP1	mg/L	<0.1	<0.1	<0.1	<0.1
MP2	mg/L	<0.1	<0.1	<0.1	<0.1
MP4	mg/L	<0.1	<0.1	<0.1	<0.1
MP5	mg/L	<0.1	<0.1	<0.1	<0.1
MP7	mg/L	<0.1	<0.1	n/a	n/a
MP10	mg/L	<0.1	<0.1	<0.1	<0.1
MP11	mg/L	<0.1	<0.1	<0.1	<0.1
GPZ1	mg/L	<0.1	<0.1	<0.1	<0.1
GPZ2	mg/L	<0.1	<0.1	<0.1	n/a
GPZ5	mg/L	<0.1	<0.1	n/a	<0.1
GPZ6	mg/L	<0.1	<0.1	<0.1	<0.1
GPZ8	mg/L	<0.1	<0.1	<0.1	<0.1
Chloride					
MP1	mg/L	219	228	231	226
MP2	mg/L	98	96	90	85
MP4	mg/L	59	61	62	58
MP5	mg/L	130	139	139	133
MP7	mg/L	1760	2570	n/a	n/a
MP10	mg/L	2270	2360	2360	2670
MP11	mg/L	30	31	31	31
GPZ1	mg/L	94	98	99	95
GPZ2	mg/L	912	1180	1140	n/a
GPZ5	mg/L	860	795	n/a	846
GPZ6	mg/L	306	280	318	304
GPZ8	mg/L	565	593	602	589

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
Hardness as CaCO3					
MP1	mg/L	232	226	222	232
MP2	mg/L	40	65	50	58
MP4	mg/L	74	76	76	69
MP5	mg/L	236	229	234	236
MP7	mg/L	1780	2760	n/a	n/a
MP10	mg/L	1800	1850	1780	1804
MP11	mg/L	300	286	277	294
GPZ1	mg/L	326	303	314	329
GPZ2	mg/L	902	1270	1140	n/a
GPZ5	mg/L	164	179	n/a	153
GPZ6	mg/L	507	480	485	517
GPZ8	mg/L	814	766	804	882
Potassium (Filtered)					
MP1	mg/L	2.8	3.0	3.0	2.8
MP2	mg/L	2.6	2.8	2.5	2.6
MP4	mg/L	1.7	1.8	1.9	1.8
MP5	mg/L	5.2	5.4	5.5	5.3
MP7	mg/L	4.3	5.8	n/a	n/a
MP10	mg/L	8.6	9.9	10.4	8.9
MP11	mg/L	1.8	2.1	1.9	1.9
GPZ1	mg/L	5.0	5.2	5.2	5.1
GPZ2	mg/L	6.7	5.0	4.6	n/a
GPZ5	mg/L	8.2	8.8	n/a	8.5
GPZ6	mg/L	3.9	3.8	4.0	4.2
GPZ8	mg/L	6.5	6.9	7.0	6.4
Sodium (Filtered)					
MP1	mg/L	134	125	123	119
MP2	mg/L	51	45	40	41
MP4	mg/L	70	62	65	61
MP5	mg/L	75	70	69	68
MP7	mg/L	452	482	n/a	n/a
MP10	mg/L	729	675	696	680
MP11	mg/L	33	32	30	30
GPZ1	mg/L	85	77	78	77
GPZ2	mg/L	288	302	296	n/a
GPZ5	mg/L	779	670	n/a	728
GPZ6	mg/L	208	193	185	190
GPZ8	mg/L	149	141	140	139
Sulphate (Filtered)					

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
MP1	mg/L	31	31	31	31
MP2	mg/L	18	18	18	19
MP4	mg/L	17	17	16	17
MP5	mg/L	13	13	13	13
MP7	mg/L	108	84	n/a	n/a
MP10	mg/L	86	85	152	89
MP11	mg/L	16	17	16	16
GPZ1	mg/L	29	27	27	26
GPZ2	mg/L	27	76	25	n/a
GPZ5	mg/L	23	73	n/a	17
GPZ6	mg/L	40	38	34	35
GPZ8	mg/L	13	14	13	13
WAD Cyanide					
MP1	mg/L	<0.004	<0.004	<0.004	<0.0004
MP2	mg/L	<0.004	<0.004	<0.004	<0.0004
MP4	mg/L	<0.004	<0.004	<0.004	<0.0004
MP5	mg/L	<0.004	<0.004	<0.004	<0.0004
MP7	mg/L	<0.004	<0.004	n/a	n/a
MP10	mg/L	<0.004	<0.004	<0.004	<0.0004
MP11	mg/L	<0.004	<0.004	<0.004	<0.0004
GPZ1	mg/L	<0.004	<0.004	<0.004	<0.0004
GPZ2	mg/L	<0.004	<0.004	<0.004	n/a
GPZ5	mg/L	<0.004	<0.004	n/a	<0.0004
GPZ6	mg/L	<0.004	<0.004	<0.004	<0.0004
GPZ8	mg/L	<0.004	<0.004	<0.004	<0.0004
Nitrate as N					
MP1	mg/L	<0.1	0.3	<0.1	<0.1
MP2	mg/L	0.3	<0.1	<0.1	0.3
MP4	mg/L	0.3	<0.1	<0.1	0.3
MP5	mg/L	0.3	<0.1	<0.1	0.3
MP7	mg/L	<0.1	<0.1	n/a	n/a
MP10	mg/L	<0.1	<0.1	<0.1	<0.1
MP11	mg/L	0.3	0.3	<0.1	<0.1
GPZ1	mg/L	0.3	<0.1	<0.1	<0.1
GPZ2	mg/L	0.2	<0.1	<0.1	n/a
GPZ5	mg/L	0.2	<0.1	n/a	<0.1
GPZ6	mg/L	4.3	4.2	4.4	4.4
GPZ8	mg/L	0.2	0.3	<0.1	<0.1
Total Kjeldhl Nitrogen as N					
MP1	mg/L	0.10	0.08	<0.05	0.17

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
MP2	mg/L	0.11	0.12	0.15	0.23
MP4	mg/L	0.14	0.15	0.15	0.32
MP5	mg/L	0.89	0.87	1.00	0.98
MP7	mg/L	0.11	0.16	n/a	n/a
MP10	mg/L	<0.05	0.14	0.18	0.15
MP11	mg/L	0.26	0.25	0.24	0.30
GPZ1	mg/L	0.24	0.22	0.30	0.26
GPZ2	mg/L	<0.05	0.07	0.14	n/a
GPZ5	mg/L	1.04	0.97	n/a	1.05
GPZ6	mg/L	0.32	0.23	0.28	0.60
GPZ8	mg/L	1.76	1.80	1.67	1.60
Total Phoshorous as P					
MP1	mg/L	<0.4	<0.4	<0.4	0.92
MP2	mg/L	<0.4	<0.4	<0.4	0.02
MP4	mg/L	<0.4	<0.4	<0.4	0.16
MP5	mg/L	<0.4	<0.4	<0.4	0.1
MP7	mg/L	<0.4	<0.4	n/a	n/a
MP10	mg/L	<0.4	<0.4	<0.4	0.03
MP11	mg/L	<0.4	<0.4	<0.4	0.04
GPZ1	mg/L	<0.4	0.9	1.2	1.25
GPZ2	mg/L	<0.4	<0.4	<0.4	n/a
GPZ5	mg/L	<0.4	<0.4	n/a	0.49
GPZ6	mg/L	<0.4	<0.4	<0.4	1.34
GPZ8	mg/L	<0.4	<0.4	3.3	0.06
Reactive Phosphorous as P					
MP1	mg/L	<0.02	0.45	0.24	0.03
MP2	mg/L	<0.02	0.02	0.04	<0.02
MP4	mg/L	<0.02	0.14	<0.02	<0.02
MP5	mg/L	<0.02	0.10	<0.02	<0.02
MP7	mg/L	<0.02	0.01	n/a	n/a
MP10	mg/L	<0.02	0.04	<0.02	<0.02
MP11	mg/L	<0.02	0.03	<0.02	<0.02
GPZ1	mg/L	1.06	1.43	0.92	0.93
GPZ2	mg/L	0.04	0.08	<0.02	n/a
GPZ5	mg/L	0.29	0.44	n/a	0.40
GPZ6	mg/L	0.08	1.05	0.06	0.05
GPZ8	mg/L	<0.02	0.10	<0.02	0.02
Total Anions					
MP1	me/L	10.0	9.8	10.3	9.75
MP2	me/L	3.8	3.7	3.6	3.49

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
MP4	me/L	4.4	4.2	4.6	4.10
MP5	me/L	7.7	7.4	7.8	7.31
MP7	me/L	57.3	79.0	n/a	n/a
MP10	me/L	71.4	73.4	75.5	82.00
MP11	me/L	7.3	6.5	7.0	6.50
GPZ1	me/L	9.6	8.9	9.5	8.76
GPZ2	me/L	33.1	41.8	40.2	n/a
GPZ5	me/L	37.1	35.0	n/a	35.40
GPZ6	me/L	18.1	15.9	18.1	17.00
GPZ8	me/L	23.1	23.1	24.1	22.80
Total Cations					
MP1	me/L	10.9	10.5	10.1	10.2
MP2	me/L	3.8	3.7	3.1	3.4
MP4	me/L	4.6	4.3	4.5	4.1
MP5	me/L	8.6	8.2	8.2	8.2
MP7	me/L	55.4	76.9	n/a	n/a
MP10	me/L	68.0	66.8	66.3	66.8
MP11	me/L	7.6	7.3	7.0	7.4
GPZ1	me/L	10.4	9.6	9.9	10.1
GPZ2	me/L	30.7	38.6	35.8	n/a
GPZ5	me/L	37.4	33.1	n/a	35.0
GPZ6	me/L	19.3	18.1	17.8	18.7
GPZ8	me/L	23.8	22.4	23.0	23.2
Actual Ion Difference (Cations-Anions)					
MP1	me/L	0.9	0.7	-0.2	0.4
MP2	me/L	0.0	0.0	-0.5	-0.1
MP4	me/L	0.2	0.2	-0.1	0.0
MP5	me/L	0.9	0.9	0.4	0.9
MP7	me/L	-1.9	-2.1	n/a	n/a
MP10	me/L	-3.4	-6.6	-9.2	-15.2
MP11	me/L	0.3	0.8	0.0	0.9
GPZ1	me/L	0.8	0.7	0.4	1.3
GPZ2	me/L	-2.4	-3.2	-4.4	n/a
GPZ5	me/L	0.3	-1.9	n/a	-0.4
GPZ6	me/L	1.2	2.2	-0.3	1.7
GPZ8	me/L	0.7	-0.7	-1.1	0.4
Allowable Ion Difference (Expressed as 10% of Total Ions)					
MP1	me/L	2.1	2.0	2.0	2.3
MP2	me/L	0.8	0.7	0.7	0.8
MP4	me/L	0.9	0.9	0.9	0.4

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
MP5	me/L	1.6	1.6	1.6	5.7
MP7	me/L	11.3	15.6	n/a	n/a
MP10	me/L	13.9	14.0	14.2	10.2
MP11	me/L	1.5	1.4	1.4	6.3
GPZ1	me/L	2.0	1.9	1.9	7.1
GPZ2	me/L	6.4	8.0	7.6	n/a
GPZ5	me/L	7.5	6.8	n/a	0.5
GPZ6	me/L	3.7	3.4	3.6	4.9
GPZ8	me/L	4.7	4.6	4.7	1.1
Aluminium (Filtered)					
MP1	µg/L	<0.02	<0.02	<0.02	<0.02
MP2	µg/L	<0.02	<0.02	<0.02	<0.02
MP4	µg/L	<0.02	<0.02	<0.02	<0.02
MP5	µg/L	0.04	0.04	0.04	0.04
MP7	µg/L	0.03	0.04	n/a	n/a
MP10	µg/L	0.03	0.08	0.03	0.06
MP11	µg/L	<0.02	0.02	0.02	0.03
GPZ1	µg/L	<0.02	0.03	0.02	0.02
GPZ2	µg/L	<0.02	0.03	0.03	n/a
GPZ5	µg/L	0.02	0.02	n/a	0.03
GPZ6	µg/L	<0.02	0.03	0.02	0.03
GPZ8	µg/L	0.02	0.04	0.02	0.04
Antimony (Filtered)					
MP1	µg/L	<3	<3	<3	<3
MP2	µg/L	<3	<3	<3	<3
MP4	µg/L	<3	<3	<3	<3
MP5	µg/L	<3	<3	<3	<3
MP7	µg/L	<3	<3	n/a	n/a
MP10	µg/L	<3	<3	<3	<3
MP11	µg/L	<3	<3	<3	<3
GPZ1	µg/L	<3	<3	<3	<3
GPZ2	µg/L	<3	<3	<3	n/a
GPZ5	µg/L	<3	<3	n/a	<3
GPZ6	µg/L	<3	<3	<3	<3
GPZ8	µg/L	<3	<3	<3	<3
Barium (Filtered)					
MP1	µg/L	219	236	210	224
MP2	µg/L	46	46	46	46
MP4	µg/L	98	98	103	85
MP5	µg/L	208	234	222	212

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
MP7	µg/L	378	606	n/a	n/a
MP10	µg/L	385	405	446	467
MP11	µg/L	657	678	662	817
GPZ1	µg/L	174	198	191	222
GPZ2	µg/L	176	222	249	n/a
GPZ5	µg/L	313	336	n/a	357
GPZ6	µg/L	197	229	180	194
GPZ8	µg/L	2670	2650	2880	3710
Berylium (Filtered)					
MP1	µg/L	0.4	0.4	0.1	0.2
MP2	µg/L	0.1	<0.1	<0.1	<0.1
MP4	µg/L	0.5	0.5	0.3	0.4
MP5	µg/L	0.2	0.2	<0.1	0.1
MP7	µg/L	0.3	1.2	n/a	n/a
MP10	µg/L	0.1	<0.1	<0.1	0.2
MP11	µg/L	<0.1	<0.1	<0.1	<0.1
GPZ1	µg/L	<0.1	<0.1	<0.1	<0.1
GPZ2	µg/L	<0.1	<0.1	<0.1	n/a
GPZ5	µg/L	<0.1	<0.1	n/a	<0.1
GPZ6	µg/L	<0.1	<0.1	<0.1	<0.1
GPZ8	µg/L	<0.1	<0.1	<0.1	0.1
Boron (Filtered)					
MP1	µg/L	0.01	<0.01	0.02	<0.01
MP2	µg/L	0.02	0.01	0.02	0.01
MP4	µg/L	0.02	0.02	0.02	0.02
MP5	µg/L	0.02	0.02	0.02	0.02
MP7	µg/L	0.02	0.02	n/a	n/a
MP10	µg/L	0.01	0.01	0.01	<0.01
MP11	µg/L	0.01	0.01	0.01	0.01
GPZ1	µg/L	0.05	0.04	0.04	0.04
GPZ2	µg/L	0.02	0.02	0.02	n/a
GPZ5	µg/L	0.05	0.05	n/a	0.06
GPZ6	µg/L	0.01	0.01	0.01	<0.01
GPZ8	µg/L	0.01	0.01	0.02	0.01
Cadmium (Filtered)					
MP1	µg/L	<0.05	<0.05	<0.05	<0.05
MP2	µg/L	0.08	<0.05	<0.05	<0.05
MP4	µg/L	<0.05	<0.05	<0.05	<0.05
MP5	µg/L	<0.05	<0.05	<0.05	<0.05
MP7	µg/L	0.59	0.05	n/a	n/a

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
MP10	µg/L	0.08	<0.05	0.06	0.08
MP11	µg/L	<0.05	<0.05	<0.05	<0.05
GPZ1	µg/L	<0.05	<0.05	<0.05	<0.05
GPZ2	µg/L	<0.05	<0.05	<0.05	n/a
GPZ5	µg/L	0.40	0.37	n/a	0.85
GPZ6	µg/L	0.06	<0.05	0.06	0.11
GPZ8	µg/L	<0.05	<0.05	<0.05	<0.05
Chromium (Filtered)					
MP1	µg/L	<0.001	<0.001	<0.001	<0.001
MP2	µg/L	<0.001	<0.001	<0.001	<0.001
MP4	µg/L	<0.001	<0.001	<0.001	<0.001
MP5	µg/L	<0.001	0.020	0.002	0.002
MP7	µg/L	<0.001	<0.001	n/a	n/a
MP10	µg/L	<0.001	<0.001	<0.001	<0.001
MP11	µg/L	<0.001	<0.001	<0.001	<0.001
GPZ1	µg/L	<0.001	<0.001	<0.001	<0.001
GPZ2	µg/L	<0.001	<0.001	<0.001	n/a
GPZ5	µg/L	<0.001	<0.001	n/a	<0.001
GPZ6	µg/L	<0.001	<0.001	<0.001	<0.001
GPZ8	µg/L	<0.001	<0.001	<0.001	<0.001
Cobalt (Filtered)					
MP1	µg/L	<0.2	<0.2	<0.2	0.4
MP2	µg/L	6.2	6.7	5.0	5.8
MP4	µg/L	1.4	1.3	1.0	1.2
MP5	µg/L	3.5	4.1	3.3	3.7
MP7	µg/L	1.6	1.7	n/a	n/a
MP10	µg/L	10.3	10.9	13.4	9.3
MP11	µg/L	0.2	0	0.4	0.7
GPZ1	µg/L	0.9	1.4	1.0	1.3
GPZ2	µg/L	0.4	.8/	1.3	n/a
GPZ5	µg/L	0.3	0.3	n/a	0.4
GPZ6	µg/L	0.3	0.3	0.4	0.7
GPZ8	µg/L	12.1	12.6	12.0	15.4
Copper (Filtered)					
MP1	µg/L	<1	<1	<1	3
MP2	µg/L	5	<1	<1	<1
MP4	µg/L	<1	1	<1	2
MP5	µg/L	<1	1	<1	4
MP7	µg/L	5	3	n/a	n/a
MP10	µg/L	7	2	2.0	4

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
MP11	µg/L	<1	3	<1	1
GPZ1	µg/L	<1	<1	<1	1
GPZ2	µg/L	1	3	<1	n/a
GPZ5	µg/L	1	<1	n/a	2
GPZ6	µg/L	2	2	<1	5
GPZ8	µg/L	1	2	3.0	2
Iron (Filtered)					
MP1	µg/L	7.41	8.19	4.3	5.86
MP2	µg/L	5.26	7.08	5.5	7.75
MP4	µg/L	0.90	1.48	1.4	1.14
MP5	µg/L	7.06	7.79	6.6	6.74
MP7	µg/L	0.81	11.00	n/a	n/a
MP10	µg/L	2.28	3.47	1.8	2.61
MP11	µg/L	2.28	2.16	1.0	1.78
GPZ1	µg/L	0.55	0.86	0.8	0.87
GPZ2	µg/L	<0.01	0.01	0.7	n/a
GPZ5	µg/L	0.28	1.10	n/a	0.43
GPZ6	µg/L	<0.01	0.01	<0.01	<0.01
GPZ8	µg/L	12.70	11.90	9.5	9.03
Lead (Filtered)					
MP1	µg/L	<0.2	<0.2	<0.2	<0.2
MP2	µg/L	<0.2	<0.2	0.4	0.2
MP4	µg/L	1.0	0.6	0.4	0.6
MP5	µg/L	<0.2	<0.2	<0.2	<0.2
MP7	µg/L	<0.2	<0.2	n/a	n/a
MP10	µg/L	0.3	0.4	<0.2	0.3
MP11	µg/L	<0.2	<0.2	<0.2	<0.2
GPZ1	µg/L	<0.2	<0.2	<0.2	<0.2
GPZ2	µg/L	<0.2	<0.2	<0.2	n/a
GPZ5	µg/L	<0.2	<0.2	n/a	<0.2
GPZ6	µg/L	<0.2	<0.2	<0.2	<0.2
GPZ8	µg/L	<0.2	<0.2	<0.2	<0.2
Magnesium (Filtered)					
MP1	µg/L	33	32	32	34
MP2	µg/L	11	12	9	10
MP4	µg/L	10	10	10	9
MP5	µg/L	12	1	12	12
MP7	µg/L	172	248	n/a	n/a
MP10	µg/L	240	254	237	243
MP11	µg/L	6	7	6	6

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
GPZ1	µg/L	32	30	32	33
GPZ2	µg/L	128	189	166	n/a
GPZ5	µg/L	21	25	n/a	21
GPZ6	µg/L	59	52	55	59
GPZ8	µg/L	92	82	93	95
Manganese (Filtered)					
MP1	µg/L	0.67	0.72	0.66	0.67
MP2	µg/L	2.00	2.06	1.68	1.94
MP4	µg/L	0.40	0.40	0.38	0.38
MP5	µg/L	1.23	1.33	1.23	1.23
MP7	µg/L	2.68	5.36	n/a	n/a
MP10	µg/L	1.78	2.03	2.14	1.53
MP11	µg/L	1.29	1.40	1.21	1.27
GPZ1	µg/L	0.72	0.89	0.82	0.85
GPZ2	µg/L	0.06	1.20	1.04	n/a
GPZ5	µg/L	0.95	1.02	n/a	0.78
GPZ6	µg/L	0.02	0.02	0.02	0.02
GPZ8	µg/L	7.45	7.44	6.55	6.31
Mercury (Filtered)					
MP1	µg/L	<0.1	<0.1	<0.1	<0.1
MP2	µg/L	<0.1	<0.1	<0.1	<0.1
MP4	µg/L	<0.1	<0.1	<0.1	<0.1
MP5	µg/L	5.6	5.6	3.8	5.2
MP7	µg/L	0.5	0.3	n/a	n/a
MP10	µg/L	0.2	<0.1	0.4	<0.1
MP11	µg/L	0.1	<0.1	0.1	<0.1
GPZ1	µg/L	<0.1	<0.1	<0.1	<0.1
GPZ2	µg/L	<0.1	<0.1	<0.1	n/a
GPZ5	µg/L	0.2	<0.1	n/a	<0.1
GPZ6	µg/L	<0.1	<0.1	<0.1	<0.1
GPZ8	µg/L	<0.1	<0.1	<0.1	<0.1
Molydbenum (Filtered)					
MP1	µg/L	<1	<1	<1	<1
MP2	µg/L	<1	<1	<1	<1
MP4	µg/L	4	4	3	4
MP5	µg/L	14	16	13	14
MP7	µg/L	10	2	n/a	n/a
MP10	µg/L	6	6	7	6
MP11	µg/L	3	3	3	4
GPZ1	µg/L	20	22	18	22

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
GPZ2	µg/L	2	2	2	n/a
GPZ5	µg/L	560	592	n/a	604
GPZ6	µg/L	26	25	2	38
GPZ8	µg/L	19	20	13	25
Nickel (Filtered)					
MP1	µg/L	<0.005	<0.005	<0.005	<0.005
MP2	µg/L	<0.005	<0.005	<0.005	<0.005
MP4	µg/L	<0.005	<0.005	<0.005	<0.005
MP5	µg/L	<0.005	<0.005	<0.005	<0.005
MP7	µg/L	<0.005	0.007	n/a	n/a
MP10	µg/L	<0.005	0.006	0.006	<0.005
MP11	µg/L	<0.005	<0.005	<0.005	<0.005
GPZ1	µg/L	<0.005	<0.005	<0.005	<0.005
GPZ2	µg/L	<0.005	<0.005	<0.005	n/a
GPZ5	µg/L	<0.005	<0.005	n/a	<0.005
GPZ6	µg/L	<0.005	<0.005	<0.005	<0.005
GPZ8	µg/L	0.005	<0.005	<0.005	0.007
Selenium (Filtered)					
MP1	µg/L	2	<1	<1	2
MP2	µg/L	1	<1	<1	1
MP4	µg/L	<1	<1	<1	<1
MP5	µg/L	1	<1	<1	2
MP7	µg/L	20	2	n/a	n/a
MP10	µg/L	24	3	3	32
MP11	µg/L	<12	<1	<1	<1
GPZ1	µg/L	1	<1	<1	2
GPZ2	µg/L	10	<1	2	n/a
GPZ5	µg/L	9	<1	n/a	11
GPZ6	µg/L	4	<1	5	5
GPZ8	µg/L	6	<1	<1	9
Silver (Filtered)					
MP1	µg/L	<1	<1	<1	<1
MP2	µg/L	<1	<1	<1	<1
MP4	µg/L	<1	<1	<1	<1
MP5	µg/L	<1	<1	<1	<1
MP7	µg/L	<1	<1	n/a	n/a
MP10	µg/L	<1	<1	<1	<1
MP11	µg/L	<1	<1	<1	<1
GPZ1	µg/L	<1	<1	<1	<1
GPZ2	µg/L	<1	<1	<1	n/a

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
GPZ5	µg/L	<1	<1	n/a	<1
GPZ6	µg/L	<1	<1	<1	<1
GPZ8	µg/L	<1	<1	<1	<1
Zinc (Filtered)					
MP1	µg/L	No Result	0.008	0.008	0.016
MP2	µg/L	0.057	0.041	0.068	0.043
MP4	µg/L	0.018	0.014	0.016	0.041
MP5	µg/L	0.018	0.011	0.017	0.022
MP7	µg/L	0.052	0.010	n/a	n/a
MP10	µg/L	0.024	0.041	0.051	0.038
MP11	µg/L	0.009	0.027	0.007	0.006
GPZ1	µg/L	<0.005	<0.005	<0.005	<0.005
GPZ2	µg/L	0.009	0.008	0.010	n/a
GPZ5	µg/L	0.010	<0.005	n/a	0.007
GPZ6	µg/L	0.007	0.014	0.006	0.022
GPZ8	µg/L	0.020	0.018	0.008	0.010
TPH C6-C9 Fraction					
MP1	µg/L	<20	<20	<20	<20
MP2	µg/L	<20	<20	<20	<20
MP4	µg/L	<20	<20	<20	<20
MP5	µg/L	<20	<20	<20	<20
MP7	µg/L	<20	<20	n/a	n/a
MP10	µg/L	<20	<20	<20	<20
MP11	µg/L	<20	<20	<20	<20
GPZ1	µg/L	<20	<20	<20	<20
GPZ2	µg/L	<20	<20	<20	n/a
GPZ5	µg/L	<20	60	n/a	80
GPZ6	µg/L	<20	<20	<20	<20
GPZ8	µg/L	<20	<20	<20	<20
TPH C10-C14 Fraction					
MP1	µg/L	<50	<50	<50	<50
MP2	µg/L	<50	<50	<50	<50
MP4	µg/L	<50	<50	<50	<50
MP5	µg/L	<50	<50	<50	<50
MP7	µg/L	<50	<50	n/a	n/a
MP10	µg/L	<50	<50	<50	<50
MP11	µg/L	<50	<50	<50	<50
GPZ1	µg/L	<50	<50	<50	<50
GPZ2	µg/L	<50	<50	<50	n/a
GPZ5	µg/L	<50	<50	n/a	<50

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
GPZ6	µg/L	<50	<50	<50	<50
GPZ8	µg/L	90	<50	<50	<50
TPH C15-C28 Fraction					
MP1	µg/L	<100	<100	<100	<100
MP2	µg/L	<100	<100	<100	<100
MP4	µg/L	<100	<100	<100	<100
MP5	µg/L	<100	<100	<100	<100
MP7	µg/L	<100	<100	n/a	n/a
MP10	µg/L	<100	<100	<100	<100
MP11	µg/L	<100	<100	<100	<100
GPZ1	µg/L	<100	<100	<100	<100
GPZ2	µg/L	<100	<100	<100	n/a
GPZ5	µg/L	<100	<100	n/a	<100
GPZ6	µg/L	<100	<100	<100	<100
GPZ8	µg/L	960	760	500	620
TPH C29-C36 Fraction					
MP1	µg/L	<50	<50	<50	<50
MP2	µg/L	<50	<50	<50	<50
MP4	µg/L	<50	<50	<50	<50
MP5	µg/L	<50	<50	<50	<50
MP7	µg/L	<50	<50	n/a	n/a
MP10	µg/L	<50	<50	<50	<50
MP11	µg/L	<50	<50	<50	<50
GPZ1	µg/L	<50	<50	<50	<50
GPZ2	µg/L	<50	<50	<50	n/a
GPZ5	µg/L	<50	<50	n/a	<50
GPZ6	µg/L	<50	<50	<50	<50
GPZ8	µg/L	850	740	80	530
TPH Total C10-C36 Fraction					
MP1	µg/L	<50	<50	<50	<50
MP2	µg/L	<50	<50	<50	<50
MP4	µg/L	<50	<50	<50	<50
MP5	µg/L	<50	<50	<50	<50
MP7	µg/L	<50	<50	n/a	n/a
MP10	µg/L	<50	<50	<50	<50
MP11	µg/L	<50	<50	<50	<50
GPZ1	µg/L	<50	<50	<50	<50
GPZ2	µg/L	<50	<50	<50	<50
GPZ5	µg/L	<50	<50	n/a	n/a
GPZ6	µg/L	<50	<50	<50	<50

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
GPZ8	µg/L	1900	1500	580	1150
Benzene					
MP1	µg/L	<1	<1	<1	<1
MP2	µg/L	<1	<1	<1	<1
MP4	µg/L	<1	<1	<1	<1
MP5	µg/L	<1	<1	<1	<1
MP7	µg/L	<1	<1	n/a	n/a
MP10	µg/L	<1	<1	<1	<1
MP11	µg/L	<1	<1	<1	<1
GPZ1	µg/L	<1	<1	<1	<1
GPZ2	µg/L	<1	<1	<1	n/a
GPZ5	µg/L	<1	<1	n/a	<1
GPZ6	µg/L	<1	<1	<1	<1
GPZ8	µg/L	<1	<1	<1	<1
Toluene					
MP1	µg/L	<2	<2		<2
MP2	µg/L	<2	<2		<2
MP4	µg/L	<2	<2		<2
MP5	µg/L	<2	<2		<2
MP7	µg/L	<2	<2	n/a	n/a
MP10	µg/L	<2	<2		<2
MP11	µg/L	<2	<2		<2
GPZ1	µg/L	<2	<2		<2
GPZ2	µg/L	<2	<2		n/a
GPZ5	µg/L	<2	<2	n/a	<2
GPZ6	µg/L	<2	<2		<2
GPZ8	µg/L	<2	<2		<2
Chlorobenzene					
MP1	µg/L	<0.001	<0.001	<0.001	<0.001
MP2	µg/L	<0.001	<0.001	<0.001	<0.001
MP4	µg/L	<0.001	<0.001	<0.001	<0.001
MP5	µg/L	<0.001	<0.001	<0.001	<0.001
MP7	µg/L	<0.001	<0.001	n/a	n/a
MP10	µg/L	<0.001	<0.001	<0.001	<0.001
MP11	µg/L	<0.001	<0.001	<0.001	<0.001
GPZ1	µg/L	<0.001	<0.001	<0.001	<0.001
GPZ2	µg/L	<0.001	<0.001	<0.001	n/a
GPZ5	µg/L	<0.001	<0.001	n/a	<0.001
GPZ6	µg/L	<0.001	<0.001	<0.001	<0.001
GPZ8	µg/L	<0.001	<0.001	<0.001	<0.001

Location	Unit	Q1	Q2	Q3	Q4
		30 Jan 2019	29 Apr 2019	23 Jul 2019	31 Oct 2019
Ethylbenzene					
MP1	µg/L	<2	<2	<2	<2
MP2	µg/L	<2	<2	<2	<2
MP4	µg/L	<2	<2	<2	<2
MP5	µg/L	<2	<2	<2	<2
MP7	µg/L	<2	<2	n/a	n/a
MP10	µg/L	<2	<2	<2	<2
MP11	µg/L	<2	<2	<2	<2
GPZ1	µg/L	<2	<2	<2	<2
GPZ2	µg/L	<2	<2	<2	n/a
GPZ5	µg/L	<2	<2	n/a	<2
GPZ6	µg/L	<2	<2	<2	<2
GPZ8	µg/L	<2	<2	<2	<2
meta & para-Xylene					
MP1	µg/L	<2	<2	<2	<2
MP2	µg/L	<2	<2	<2	<2
MP4	µg/L	<2	<2	<2	<2
MP5	µg/L	<2	<2	<2	<2
MP7	µg/L	<2	<2	n/a	n/a
MP10	µg/L	<2	<2	<2	<2
MP11	µg/L	<2	<2	<2	<2
GPZ1	µg/L	<2	<2	<2	<2
GPZ2	µg/L	<2	<2	<2	n/a
GPZ5	µg/L	<2	<2	n/a	<2
GPZ6	µg/L	<2	<2	<2	<2
GPZ8	µg/L	<2	<2	<2	<2
ortho-Xylene					
MP1	µg/L	<2	<2	<2	<2
MP2	µg/L	<2	<2	<2	<2
MP4	µg/L	<2	<2	<2	<2
MP5	µg/L	<2	<2	<2	<2
MP7	µg/L	<2	<2	n/a	n/a
MP10	µg/L	<2	<2	<2	<2
MP11	µg/L	<2	<2	<2	<2
GPZ1	µg/L	<2	<2	<2	<2
GPZ2	µg/L	<2	<2	<2	n/a
GPZ5	µg/L	<2	<2	n/a	<2
GPZ6	µg/L	<2	<2	<2	<2
GPZ8	µg/L	<2	<2	<2	<2

Blast Monitoring Results

Date	Granite Pit						Ignimbrite Pit					
	B4 Residents		B5 Residents		B6 Rail	B6 Pipeline	B1 Rail		B2 Pipeline		B3 Residents	
	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	PPV (mm/s)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)
January												
04-01-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5	Monitoring not required at these locations in Granite Pit Blast					
05-01-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
08-01-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	1.02	1.02						
09-01-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
11-01-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.66	0.66						
15-01-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	1.48	1.48						
16-01-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
18-01-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.79	0.79						
22-01-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	1.61	1.6						
24-01-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.55	0.55						
30-01-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.58	0.58						
February												
04-02-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	1.56	1.56	Monitoring not required at these locations in Granite Pit Blast					
06-02-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.88	0.88						
08-02-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5	DNT <100	0.6		3.06	DNT <100	DNT <0.5

Date	Granite Pit						Ignimbrite Pit					
	B4 Residents		B5 Residents		B6 Rail	B6 Pipeline	B1 Rail		B2 Pipeline		B3 Residents	
	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	PPV (mm/s)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)
12-02-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5	Monitoring not required at these locations in Granite Pit Blast					
13-02-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.79	0.79						
18-02-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.87	0.87						
19-02-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
20-02-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.66	0.66						
21-02-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.54	0.54						
26-02-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.71	0.71						
March												
01-03-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	1.15	1.15	Monitoring not required at these locations in Granite Pit Blast					
05-03-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
08-03-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
12-03-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	1.05	1.05						
13-03-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
14-03-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
19-03-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.72	0.72						
20-03-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
26-03-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.66	0.66						

Date	Granite Pit						Ignimbrite Pit					
	B4 Residents		B5 Residents		B6 Rail	B6 Pipeline	B1 Rail		B2 Pipeline		B3 Residents	
	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	PPV (mm/s)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)
27-03-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.86	0.86						
April												
02-04-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5	Monitoring not required at these locations in Granite Pit Blast					
08-04-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.71	0.71						
11-04-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.87	0.87						
16-04-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.91	0.91						
17-04-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
18-04-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
30-04-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
May												
02-05-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5	Monitoring not required at these locations in Granite Pit Blast					
07-05-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
09-05-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
13-05-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.73	0.73						
16-05-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
17-05-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
22-05-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.91	0.91						

Date	Granite Pit						Ignimbrite Pit					
	B4 Residents		B5 Residents		B6 Rail	B6 Pipeline	B1 Rail		B2 Pipeline		B3 Residents	
	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	PPV (mm/s)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)
24-05-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.81	0.81						
June												
04-06-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.63	0.63	Monitoring not required at these locations in Granite Pit Blast					
06-06-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
07-06-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
13-06-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
15-06-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
18-06-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.79	0.79						
21-06-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.76	0.76						
27-06-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
28-06-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.73	0.73						
July												
02-07-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5	Monitoring not required at these locations in Granite Pit Blast					
04-07-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.81	0.81						
09-07-2019	82.9	0.59	DNT<100	DNT <0.5	DNT <0.5	DNT <0.5						
18-07-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
24-07-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	1.04	DNT <0.5						

Date	Granite Pit						Ignimbrite Pit					
	B4 Residents		B5 Residents		B6 Rail	B6 Pipeline	B1 Rail		B2 Pipeline		B3 Residents	
	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	PPV (mm/s)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)
25-07-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
August												
01-08-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	0.7	DNT <0.5	Monitoring not required at these locations in Granite Pit Blast					
06-08-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
08-08-2019	94.9	0.55	111.6	DNT <0.5	0.65	0.65						
14-08-2019	DNT <100	DNT <0.5	DNT <100	DNT <0.5	DNT <0.5	DNT <0.5						
September												
04-09-2019	DNT<100	DNT<0.5	DNT<100	DNT <0.5	DNT <0.5	DNT <0.5	Monitoring not required at these locations in Granite Pit Blast					
19-09-2019	DNT<100	DNT<0.5	DNT<100	DNT <0.5	0.71	0.71						
26-09-2019	DNT<100	DNT<0.5	88.9	0.57	0.67	0.67						
October												
03-10-2019	DNT<100	DNT<0.5	99.8	0.73	0.76	0.76	Monitoring not required at these locations in Granite Pit Blast					
17-10-2019	DNT<100	DNT<0.5	DNT<100	DNT <0.5	0.72	0.72						
24-10-2019	DNT<100	DNT<0.5	DNT<100	DNT <0.5	DNT <0.5	DNT <0.5						
November												
14-11-2019	DNT<100	DNT<0.5	DNT<100	DNT <0.5	DNT <0.5	DNT <0.5	Monitoring not required at these locations in Granite Pit Blast					
21-11-2019	DNT<100	DNT<0.5	DNT<100	DNT <0.5	0.63	0.63						

Date	Granite Pit						Ignimbrite Pit					
	B4 Residents		B5 Residents		B6 Rail	B6 Pipeline	B1 Rail		B2 Pipeline		B3 Residents	
	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	PPV (mm/s)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)	Over pressure (dB)	PPV (mm/s)
25-11-2019	DNT<100	DNT<0.5	DNT<100	DNT <0.5	DNT <0.5	DNT <0.5						
28-11-2019	DNT<100	DNT<0.5	DNT<100	DNT <0.5	0.70	0.70						
December												
05-12-2019	DNT<100	DNT<0.5	DNT<100	DNT <0.5	DNT <0.5	DNT <0.5	Monitoring not required at these locations in Granite Pit Blast					
10-12-2019	DNT<100	DNT<0.5	DNT<100	DNT <0.5	0.70	0.70						
12-12-2019	DNT<100	DNT<0.5	DNT<100	DNT <0.5	DNT <0.5	DNT <0.5						
18-12-2019	DNT<100	DNT<0.5	85.6	0.61	0.66	0.66						

DNT – Did not trigger

APPENDIX 3
IEA Action Plan

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
	SCHEDULE 2 GENERAL ADMINISTRATIVE CONDITIONS						
	Obligation to Minimise Harm to the Environment						
DA1	2	1	The Applicant must implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the development.	Site observations.	A wide range of measures to prevent and/or minimise any harm to the environment that may result from the operation have been implemented. During the audit inspection, the site was generally well maintained and tidy.	Compliant	
	Terms of Approval						
		2	The Applicant must carry out the development:	-		-	
DA2		2 (a)	(a) generally in accordance with the EIS, EA (Mod 1), EA (Mod 2), EA (Mod 3), EA (Mod 4) and EA (Mod 5); and	Site observations.	The development is generally in accordance with DA (as modified) and as described in the associated environmental assessment documents. Some sediment dams have not been installed. However, these are associated with areas that have not yet been materially disturbed.	Compliant	
DA3		2 (b)	(b) in accordance with the Development Layout Plan, the Statement of Commitments and the conditions of this consent. *Notes:* *The Development Layout Plan is included in Appendix 2, The Statement of Commitments is included in Appendix 11*	Site observations. Review of DigitalGlobe satellite image against Appendix 2 (Development Layout) and Appendix 4 (Location of Sediment Dams) of the development consent.	Development is generally in accordance with DA. Some sediment dams have not been installed. However, these are associated with areas that have not yet been materially disturbed.	Compliant	
DA4		3	If there is any inconsistency between the documents identified in condition 2(a), the more recent document shall prevail to the extent of the inconsistency. The conditions of this consent shall prevail to the extent of any inconsistency with the documents identified in condition 2(a) or the Statement of Commitments.	-	-	Note	
DA5		4	The Applicant shall comply with any reasonable requirement/s of the Secretary arising from the Department's assessment of:	Email: M. Dawson, DPE, to P. Towler, EMM, 24/11/17.	We understand that DPE has not provided any directions since the last audit (22 October 2014) and none were mentioned in consultation with DPE at the commencement of this audit.	Not triggered	
DA6		4 (a)	(a) any reports, plans, programs, reviews, audits, reports or correspondence that are submitted in accordance with this consent (including any stages of these documents);	Email: M. Dawson, DPE, to P. Towler, EMM, 24/11/17.	As above	Not triggered	
DA7		4 (b)	(b) any reviews, reports or audits commissioned by the Department regarding compliance with this consent; and	Email: M. Dawson, DPE, to P. Towler, EMM, 24/11/17.	As above	Not triggered	
DA8		4 (c)	(c) the implementation of any actions or measures contained in these documents.	Email: M. Dawson, DPE, to P. Towler, EMM, 24/11/17.	As above	Not triggered	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
	Limits on Approval						
DA9		5	The Applicant may carry out quarrying operations as part of the development until 1 January 2038. *Note: Under this consent, the Applicant is required to rehabilitate lands associated with the development and carry out additional undertakings to the satisfaction of the Secretary. Consequently this consent will continue to apply in all other respects other than the right to conduct quarrying operations until the rehabilitation of lands associated with the development and those undertakings have been carried out to a satisfactory standard.*	-	-	Not triggered	
		6	***Deleted***				
DA10		7	The Applicant must not transport more than 5 million tonnes of products from the site in a year.	Sighted spreadsheet called *Lynwood Monthly Sales Confidential Report [Confidential]* which included the total annual amount of product transported from site.	2005 EIS: section 3.4.2: states that production will reach 5 tpa. after 3 year and will remain at this level for the initial 30 year quarry plan. 2011 SEE: Despite proposed modifications, the project will still only produce 5 million tones per annum of saleable quarry product p. 2. section 2, however, states that they have approval to transport 5 Tap. by rail and 1.5 Tap. by road which, if combined, would be more transported product than allowed. 2010 EA: The proposed 2nd round of modifications states that approved production rate will not change. 2015 EA Mod 4: The proposed 4th round of modifications states that approved production rate will not change. 2017 EA Mod 5: The proposed 5th round of modifications applies to the retirement of biodiversity credits and includes no change to production.	Compliant	
DA11		8	The Applicant must not transport more than 1.5 million tonnes of product from the site in a year by road.	EMM audit team sighted spreadsheet called *Lynwood Monthly Sales Confidential Report [Confidential]* which included the total annual amount of product transported from site.		Compliant	
	Structural Adequacy						
DA12		9	The Applicant must ensure that any new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA. Notes: • Under Part 4A of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for any building works. • Part 8 of the EP&A Regulation sets out the detailed requirements for the certification of development.	Construction certificates were sighted during 2015 audit.	**Construction and occupation certificates are not available for the pre-coat plant constructed within the audit period (22 October to 9 January 2018).** **Recommendation (REC1): the construction and occupation certificates for the pre-coat plant are obtained.**	Non-compliant	Obtain necessary documents from Suppliers, Engineering Consultants &Original Project Certifier. **Target Completion**: July 2019 Status March 2020: Application for Building Information Certificate for Precoat Plant has been lodged with Goulburn Council. Awaiting completion of structural works & engineering certification to enable Certificate to be issued.

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
	Demolition						
DA13		10	The Applicant must ensure that all demolition work is carried out in accordance with *AS 2601-2001: The Demolition of Structures* , or its latest version.	-		Not triggered	
	Protection of Public Infrastructure						
		11	Unless the Applicant and the applicable authority agree otherwise, the Applicant must:				
DA14		11 (a)	(a) repair, or pay all reasonable costs associated with repairing any public infrastructure that is damaged by the development; and	Site interviews.		Not triggered	
DA15		11 (b)	(b) relocate, or pay all reasonable costs associated with relocating any public infrastructure that needs to be relocated as a result of the development.	Site interviews.	No public infrastructure was relocated during the audit period.	Not triggered	
	Operation of Plant and Equipment						
		12	The Applicant must ensure that all plant and equipment at the site, or used in connection with the development are:				
DA16		12 (a)	(a) maintained in a proper and efficient condition; and	Sighted randomly selected operation of equipment maintenance (OEM) records.	The OEMs contain information about plant and equipment maintained onsite, any issues experienced with the machinery and work undertaken to repair these issues.	Compliant	
DA17		12 (b)	(b) operated in a proper and efficient manner.	No site observations indicated that equipment was poorly operated.		Compliant	
	Production data						
		13	The Applicant must:				
DA18		13 (a)	(a) provide annual quarry production data to DRG using the standard form for that purpose; and	Viewed Excel spreadsheet of production data.	Following EMM's agency consultation as part of this audit DRG's response (1 December 2017), DGR noted that "according to departmental records, no production data has been received for the 2016-2017 financial year to date. To satisfy the requirements of Condition 12, the quarry operator should provide the requested data to DRG - Royalties & Advisory Services at mineral.royalty@industry.nsw.gov.au". Holcim's head office provides annual quarry production data to DRG for all Holcim sites. The Lynwood Quarry data was provided on 3 January 2018.	Compliant	
DA19		13 (b)	(b) include a copy of this data in the Annual Review.	Lynwood Quarry Annual Environment Review, March 2017.	The Annual Review due date has changed from mid-year to calendar year. The latest Annual Environmental Review (AER) for the Lynwood Quarry in the audit period was submitted in March 2017. Table 5 Production within the reporting period provides total production data for the interim reporting period. This is condition was added in the May 2016.	Compliant	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
	Compliance						
DA20		14	The Applicant must ensure that all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this consent relevant to their respective activities.	Training modules: ENV: Training and Awareness, and HAUS Introduction to Environmental Risk Management.	Site interviews indicated that all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this consent relevant to their respective activities via site inductions and the following training modules: ENV: Training and Awareness, and HAUS Introduction to Environmental Risk Management.	Compliant	
	SCHEDULE 3 - SPECIFIC ENVIRONMENTAL CONDITIONS						
	GENERAL EXTRACTION AND PROCESSING PROVISIONS						
	Identification of Boundaries						
	3	1	Prior to carrying out any development, or as otherwise agreed by the Secretary, the Applicant must:				
DA21		1 (a)	(a) engage an independent registered surveyor:	Sighted a copy of Southern Cross's documentation relevant to the granite extraction survey area dated 2 September 2016.	The survey covers the site area up to site boundaries and does not include non-disturbance zones.	Compliant	
DA22			• survey the boundaries of the approved limit of extraction; and	Sighted a copy of Southern Cross's documentation relevant to the granite extraction survey area dated 2 September 2016.		Compliant	
DA23			• submit a survey plan of these boundaries to the Department;	Sighted Holcim's letter re: DA 128-5-2005 Schedule 3, Condition 1a: Submission of surveyed extraction limit boundaries, addressed to Margaret Kirton, DPE dated October 2016.		Compliant	
DA24		1 (b)	(b) ensure that these boundaries are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify those limits.	Site observations.	Observed site boundaries were either fenced or marked with signs. It was reported that posts were installed by the surveyor.	Compliant	
	Development in the Riparian						
DA25		2	The Applicant must not carry out any development in the riparian zone of Joarimin, Lockyersleigh or Marulan Creek without the written approval of DPI Water. Any such development must be carried out in accordance with an approved Riparian Area Management Plan (see conditions 44 and 45).	Rehabilitation and Landscape Management Plan (Rev 2). Appendix 3: Lockyersleigh Creek RAMP Appendix 4: Joarimin Creek Management Plan. Site observations.	The Riparian Area Management plan is shown in the 2011 Rehabilitation and Landscape Management Plan (Rev 2). The majority of riparian zones were inspected. They were all fenced and marked with signs. One fence (about 100 m long) was damaged. It was reported that repairs had been organised. No development activities in the riparian zones that are mentioned in this condition were noted during the site inspection or in the reviewed documentation.	Compliant	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
	NOISE (Incorporates OEH GTA)						
	Noise Limits						
DA26		3	The Applicant must ensure that the noise generated by the operation of the development does not exceed the criteria in Table 1 at any residence on privately-owned land. Table 1 Noise Assess Location -- Day(Laeq-15 minutes)/Evening(LAeq(15 minutes)/Night(Laeq-15 minutes)/Night(LA1-1 minute): 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 Notes: Receiver locations are shown on the plan in Appendix 3.	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, April 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, June 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, September 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, December 2017. INX community complaint reports for audit period, including complaints recorded on 21 September 2017 and 27 November 2017.	**Noise is monitored quarterly at four representative locations which are representative of the receivers listed.** **2015 AER 2014/2015: section 3.0 states that four quarterly monitoring events took place within the reporting period and found that review of all documents confirmed that construction and operation noise complied with legislative noise emission requirements.** **There was one noises exceedance during the audit period - on 15 June 2016 (AER, September 2016).** **Holcim has undertaken corrective action including notifying the DPE Secretary of the exceedance and actions taken to address the above (sighted letter addressed to Katrina O'Reilly and Margaret Kirton, August 2016).** **Holcim received noise complaints from the same Marulan resident on two separate occasions. These incidents were reported and managed via the internal INX system. A. White has spoken to concerned residents, and the issue has been closed by Holcim.** **No further actions are recommended.**	Non-compliant	Continue to address complaints in a timely manner as they arise. Continue to report any exceedances of Consent Conditions as they occur **Target Completion**: Ongoing Status March 2020: Systems are in place & actions are ongoing
			Noise generated by the development is to be measured in accordance with the relevant requirements of the INP (as may be updated from time-to-time). Appendix 10 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria. However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, April 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, June 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, September 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, December 2017.	There were no recorded exceedances at Holcim owned properties.	Compliant	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
	Noise Mitigation Measures						
	4	4	The Applicant must:				
DA27		4 (a)	(a) implement best practice management to minimise the operational noise of the development;	Site observations. Site interviews.	Holcim have an ongoing noise reduction program, eg installation of reversing "squawkers", and limiting operations at night, and recently, to address the noise at the newly formed emplacement area, Holcim has built a wall of material along the southern aspect for the Heavy Mobile Equipment (HME) to work behind. This will reduce any noise travelling to the south.	Compliant	
DA28		4 (b)	(b) implement all reasonable and feasible measures to minimise road transportation noise associated with the development;	Site observations. INX Community Complaint Report dated 27 November 2017	INX Community Complaint Report dated 27 November 2017 showed that a resident complained about hearing trucks accelerating. A. White has spoken to the resident and closed out the matter.	Compliant	
DA29		4 (c)	(c) minimise the noise impacts of the development during meteorological conditions when the noise criteria in this consent do not apply (see Appendix 10);	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, April 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, June 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, September 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, December 2017.	The noise exceedance on 15 July 2016 was not reported to occur during meteorological conditions when the noise criteria in this consent do not apply.	Compliant	
DA30		4 (d)	(d) carry out regular monitoring to determine whether the development is complying with the relevant conditions of this consent; and	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, April 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, June 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, September 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, December 2017.		Compliant	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA31		4 (e)	(e) regularly assess noise monitoring data and modify and/or stop operations on site to ensure compliance with the relevant conditions of this consent,	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, April 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, June 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, September 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, December 2017.	As noted in regards to Schedule 3, Condition 3, corrective actions were taken in response to recorded noise exceedances.	Compliant	
			to the satisfaction of the Secretary.	-		Note	
	Operating Hours						
		5	The Applicant must comply with the operating hours in Table 2:				
DA32			Construction works Monday-Friday: 7am to 6pm Saturday: 8am to 1pm Sunday and Public Holidays: None	Lynwood Quarry Annual Environment Review, September 2015.	Construction and commissioning was completed on 5 October 2015. The 2015 AER does not report compliance with construction hours. Although shift change-over reports were provided for evidence of working hours, none of them fell within the period prior to 5 October 2015 (and thus construction). (Compliance with operating hours is reported in the 2016 and 2017 AERs - see below).	Compliant	
DA33			Topsoil/ overburden removal /emplacement; drilling Any day: 7am to 6pm	Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	The AERs report "all operations undertaken at Lynwood Quarry were undertaken as per the Schedule 3, Condition 5."	Compliant	
DA34			Blasting Monday-Saturday: 9am to 5pm Sunday and Public Holidays: None	Site interviews. Monitoring reports (https://www.holcim.com.au/sustainability/environment/pollution-monitoring-data#tabs-0-68884600-1525050091-0)	**Two INX Community Complaint Records (entered into system 19 May 2016 and 21 September 2017, from two different residents) record complaints about blasting activities (with a focus on the level of noise/vibration rather than the blast time). In addition, one blasting complaint letter was sent by a community member to DPE. However, monitoring results do not indicate that criteria were exceeded.** **Pollution monitoring data provided on Holcim's website shows that blasts mostly occur between 11 am - 2 pm. However there were a number of entries listing "12.00am". It is reasonable to conclude that this is a mistake as complaints would have been made if blasting occurred at midnight.** **Recommendation (REC2): all monitoring reports should be carefully checked before being issued.**	Compliant	
DA35			Extraction Any day: 7am to 10pm	Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	The AERs report "all operations undertaken at Lynwood Quarry were undertaken as per the Schedule 3, Condition 5."	Compliant	
DA36			Processing (crushing, screening, stockpiling); loading, delivery, and distribution; maintenance Any day: Anytime	Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	The AERs report "all operations undertaken at Lynwood Quarry were undertaken as per the Schedule 3, Condition 5."	Compliant	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
			Notes: *• Table 2 only relates to construction works that are audible at any residential receivers on privately owned land. Construction works that are inaudible at any residential receiver may be carried out at any time.* *• Construction works within the Hume Highway reserve may be undertaken outside the hours specified in Table 2 with the written approval of the RMS.*	-		Note	
	Monitoring		**Noise Management Plan**				
DA37		6	The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Secretary. In addition to the standard requirements for management plans (see condition 2 of Schedule 5) this plan must:				
DA38		6 (a)	(a) be submitted to the Secretary for approval by 30 November 2016, unless otherwise agreed by the Secretary;	Sighted letter from DPE approving Noise Management Plan (dated 7/12/2016).		Compliant	
DA39		6 (b)	(b) describe the measures that would be implemented to ensure: • compliance with the noise criteria in this consent; • best practice management is being employed; and • the noise impacts of the development are minimised during meteorological conditions under which the noise criteria in this consent do not apply (see Appendix 10);	Lynwood Quarry, Noise Management Plan, September 2016.		Compliant	
DA40		6 (c)	(c) describe the proposed noise management system; and	Lynwood Quarry, Noise Management Plan, September 2016.	Section 4.0 of Noise Management Plan	Compliant	
DA41		6 (d)	(d) include a monitoring program that will be put in place to measure noise from the development against the noise criteria in Table 1, including noise monitoring to validate the predicted noise impacts for Location 11 contained in the EA (Mod 4), and which evaluates and reports on the effectiveness of the noise management system on site.	Lynwood Quarry, Noise Management Plan, September 2016. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, April 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, June 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, September 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, December 2017.	Section 5.0 of Noise Management Plan The monitoring was performed by a third party in accordance to the Noise Management Plan and in general accordance with the Noise Policy for Industry to address conditions outlined in the Development Consent.	Compliant	
DA42			The Applicant must implement the management plan as approved from time to time by the Secretary.	Site observations. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, April 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, June 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, September 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, December 2017.	The measures listed in Section 4.0 of Noise Management Plan appear to have been implemented. The monitoring records do not include all of the information specified in Section 5.1 of the Noise Management Plan, eg operator name, time of measurement, height of the microphone, etc. **Recommendation (REC3): monitoring records need to provide all monitoring conditions and the name of the operator.**	Compliant	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
	BLASTING AND VIBRATION (Incorporates OEH GTA)						
	Airblast Overpressure Criteria						
DA43		7	The Applicant must ensure that the airblast overpressure level from blasting at the development does not exceed the criteria in Table 3 at any residence on privately owned land. **Table 3: Airblast overpressure level: allowable exceedance** 115 dB(Lin Peak): 5% of the total number of blasts over a period of 12 months 120 dB(Lin Peak): 0%	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Fortnightly monitoring results: - Environmental_Monitoring_171001-171015 - Environmental_Monitoring_171016-171031 - Environmental_Monitoring_171101-171115 - Environmental_Monitoring_171116-171130 - environmental_monitoring_171201-171215 - environmental_monitoring_171216-171231 - environmental_monitoring_180101-180115	2015/2014 AER section 4.0 states that a total of 20 blasts were conducted during the 2015-2015 period with no exceedances. Table 3 of the AER provides the results of each blast and the corresponding monitoring locations. Blasting times are not provided. 2016/2015 AER section 6.2 states that a total of 54 blasts were recorded during the reporting period. This has caused the loss of blast monitoring data for blast on dates. There were no exceedances as can be seen in Table 8 Blast data 2015 - 2016. Blast records for 14/12/2015, 17/12/2015, 7/01/2016, 10/01/2016, 14/01/2016 and 21/01/2016 were not available from the blasting contractors. Appendix 2 of the AER includes Holcim's letter (dated 26 February 2016) to Oliver Holm and Kane Winwood, DPE, regarding the lost blasting monitoring records. 2017/2016 AER section 6.2 states that a total of 34 blasts were recorded during the reporting period, without an exceedance. Table 7. Blast data 2015 - 2016 shows that none were above 5mm/s allowed vibration levels. Times of blasting activities were not recorded. The fortnightly monitoring reports for the last three months of the audit period were examined as a sample of these reports. No exceedances were reported. However, some data was incorrectly entered (eg results for 23/10/17). Recommendation: Refer to (REC2).	Compliant	
	Ground Vibration Impact Assessment Criteria						
		8	The Applicant must ensure that the ground vibration level from blasting at the development does not exceed the criteria in Table 4 at any residence on privately owned land, or the criteria in Table 5 for the nominated infrastructure.	-		-	
DA44			**Table 4: Ground vibration impact assessment criteria for residences on privately-owned land** Peak particle velocity: allowable exceedance 5 mm/s: (5% of the total number of blasts over a period of 12 months) 10 mm/s: 0%	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Fortnightly monitoring results: - Environmental_Monitoring_171001-171015 - Environmental_Monitoring_171016-171031 - Environmental_Monitoring_171101-171115 - Environmental_Monitoring_171116-171130 - environmental_monitoring_171201-171215 - environmental_monitoring_171216-171231 - environmental_monitoring_180101-180115 Neighbour blast notification register.	Holcim have a system that tracks notification of neighbouring six properties prior to blasting activities (spreadsheet available - Neighbour blast notification register). No blast exceedances are reported in the AERs. The fortnightly monitoring reports for the last three months of the audit period were examined as a sample of these reports. No exceedances were reported.	Compliant	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA45			**Table 5: Ground vibration impact assessment criteria on infrastructure** Peak particle velocity of 25 mm/s: Main Southern Railway Line Reservoir Peak particle velocity of 100 mm/s: Gas Pipeline	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Fortnightly monitoring results: - Environmental_Monitoring_171001-171015 - Environmental_Monitoring_171016-171031 - Environmental_Monitoring_171101-171115 - Environmental_Monitoring_171116-171130 - environmental_monitoring_171201-171215 - environmental_monitoring_171216-171231 - environmental_monitoring_180101-180115 Neighbour blast notification register.	Holcim have a system that tracks notification of neighbouring six properties prior to blasting activities (spreadsheet available - Neighbour blast notification register). No blast exceedances are reported in the AERs. The fortnightly monitoring reports for the last three months of the audit period were examined as a sample of these reports. No exceedances were reported.	Compliant	
DA46			Peak particle velocity (mm/s) of 100: Gas Pipeline	No exceedances reported in AMR for the audit period		Compliant	
DA47			However, if the Applicant has a written agreement with the ARTC to vary the peak particle velocity for the Main Southern Railway Line in Table 5, and a copy of this agreement has been forwarded to the Department, then the Applicant may exceed the limit specified in Table 5 in accordance with the written agreement.	-		Not triggered	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
	Operating Conditions						
DA48		9	During the development, the Applicant must implement best blasting practice to: (to the satisfaction of the Director-General.)	Blast Management Plan (November 2016). Letter from H. Reed, DPE dated 7 December 2016. Letter from Holcim to DPE regarding DA 128-5-2008 granite pit blast GR1701 dated February 2017.	Blast Management Plan dated November 2016 summarises Blast Management, description of blasting activities for site and operational controls. Letter from H. Reed, DPE dated 7 December 2016 states that the Department has reviewed the Blast Management Plan (November 2016) and is satisfied that it addresses the relevant requirements of the consent. Letter to DPE summarises events surrounding a drill and blast procedure performed in the granite pit. During the process, one monitoring point (B4) was not monitored as required by DA 128-5-2005. This was rectified by placing a permanent monitor at all locations to ensure this does not occur again.	Compliant	
DA49		9 (a)	(a) ensure that no flyrock leaves the site;	Blast Management Plan (November 2016).	Blast Management Plan, Section 5.2 (operational controls) states that Holcim will implement the following blast management practices: "detailed design for each blast in order to maximise the blast efficiency, minimise dust, fumes, ground vibration and air blast, the potential for fly rock as well as to ensure compliance with site specific blasting conditions." There are wide buffers, blasts are planned and there are no reports of fly rock leaving the site.	Compliant	
DA50		9 (b)	(b) protect the safety of people, property, and livestock;	Blast Management Plan (November 2016).	Section 5.2 operational controls of the Blast Management Plan notes that Holcim will identify exclusion zones for each blast to protect the safety of personnel and assets.	Compliant	
DA51		9 (c)	(c) minimise the dust and fume emissions from blasting on the site,	Blast Management Plan (November 2016). INX Community Complaint Reports from three residents dated 19 May 2016, 21 September 2017 and 21 September 2017 regarding blasting activities (one directly related to dust from blasting activities).	**2016/2017 AER section 9.3 states that there were no community complaints during the interim reporting period.** **2016/2015 AER section 9.3 (page 33) 'Community complaints' states that complaints were received about dust management and blasting activities. Dust monitors (DDG and PM10) were placed at the residence of the complainant, noise experts were engaged, water filters were supplied and a number of meetings were conducted between the resident and Holcim personnel. Reports have been provided to the resident and various government departments regarding dust emissions. The AER report states that all monitoring data installed and around their residence provides no indication of any dust measuring above environmental performance measures. As part of their due diligence, Lynwood undertook monitoring during the subsequent six blast events. There was no exceedance measured during any of these blasts.** **2015/2014 section 19.2 shows that one complaint about blasting was received. Monitoring was undertaken at the residents location to provide data that was proximate to the location of the complaint. After two monitoring events showed no results, Holcim ceased monitoring at the location. Holcim has continued dialogue with the resident.** **All INX Community Complaint Reports were closed out either by discussing the issue with the complainant or by taking, or committing to, actions to resolve complaints related to blasting activities.** **No further actions are recommended.**	Compliant	
			to the satisfaction of the Secretary.	-		Note	
	Public Notice						
		10	During the development, the Applicant must:				
DA52		10 (a)	(a) notify the landowner/occupier of any residence within 2 kilometres of the quarry pit who registers an interest in being notified about the blasting schedule on site;	Blast Management Plan (November 2016).	Six neighbouring properties are notified of the blasting schedule.	Compliant	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA53		10 (b)	(b) operate a blasting hotline, or alternative system agreed to by the Secretary to enable the public to get up-to-date information on blasting operations at the development; and	Blast Management Plan (November 2016). Blasting hotline phone number on Holcim's website http://www.holcim.com.au/about-us/community-link/lynwood/contact-details.html	Blast Management Plan, Section 9.0 (Complaints) states that Holcim maintains a blast hotline that allows the community to contact Lynwood Quarry about blasting activities. It also allows members of the community within a 2 km radius to register and be notified of blasting activities. All complaints are investigated, and If a community member raises concerns, Holcim will arrange for up to six due diligence monitoring events to occur at or near the premises. The data recorded will be assessed, recorded and discussed with the Quarry Manager and community member. Table 10 lists potential problems that may arise and corrective actions that would be taken.	Compliant	
DA54		10 (c)	(c) keep the public informed about this hotline (or any alternative system).	Blasting hotline phone number on Holcim's website http://www.holcim.com.au/about-us/community-link/lynwood/contact-details.html		Compliant	
			to the satisfaction of the Secretary.				
	Blast Management Plan						
		11	The Applicant must prepare a Blast Management Plan for the development to the satisfaction of the Secretary. In addition to the standard requirements for management plans (see condition 2 of Schedule 5) this plan must:	-		-	
DA55		11 (a)	(a) be submitted to the Secretary for approval by 30 November 2016, unless otherwise agreed by the Secretary;	Blast Management Plan (November 2016). Letter from H. Reed, DPE dated 7 December 2016.		Compliant	
DA56		11 (b)	(b) describe the measures that would be implemented to ensure compliance with the blast criteria and operating conditions of this consent;	Blast Management Plan (November 2016).	The Blast Management Plan uses first year of blasting monitoring data as the baseline data for monitoring points. The plan uses assessment criteria from the Development Consent Conditions 7 and 8.	Compliant	
DA57		11 (c)	(c) include a monitoring program for evaluating and reporting on compliance with the blasting criteria in this consent; and	Blast Management Plan (November 2016).	A monitoring program is included in Section 6 of the Blast Management Plan.	Compliant	
DA58		11 (d)	(d) include a protocol for investigating and responding to complaints.	Blast Management Plan (November 2016).	A protocol for investigating and responding to complaints included in the Blast Management Plan, Section 9.	Compliant	
			The Applicant must implement the management plan as approved from time to time by the Secretary.	Blast Management Plan (November 2016). Site observations.		Compliant	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
	AIR QUALITY (Incorporates OEH GTA)						
	Impact Assessment Criteria						
DA59		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.	Lynwood Quarry Annual Environment Review, September 2015 Lynwood Quarry Annual Environment Review, September 2016 Lynwood Quarry Annual Environment Review, March 2017 INX Community Complaint Reports for audit period (in particular report dated 21 September 2017). INX Environment Report for audit period (in particular report dated 5 January 2017) Holcim letters to DPE regarding dust deposition gauge monitoring results, as below: - letter dated 11 January 2011 regarding monitoring results at DG #3 - letter dated 4 February 2016 regarding monitoring results at DG #3 and #9 - letter dated 12 March 2016 regarding monitoring results at DG #7 and #8 monitoring results at DG #3 and #10 - letter dated 20 June 2016 regarding monitoring results at DG #5	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. 2016/2015 AER section 9.3 (page 33) 'Community complaints' states that complaints were received about dust management and blasting activities. Dust monitors (DDG and PM10) were placed at the residence of the complainant, noise experts were engaged, water filters were supplied and a number of meetings were conducted between the resident and Holcim personnel. Reports have been provided to the resident and various government departments regarding dust emissions. The AER report states that all monitoring data installed and around their residence provides no indication of any dust measuring above environmental performance measures. As part of their due diligence, Lynwood undertook monitoring during the subsequent six blast events. There was no exceedance measured during any of these blasts. Lynwood Quarry Annual Environmental Review, September 2015: - there were no exceedances of the TSP or annual PM10 criteria; - there was one exceedence (50.9 ug/m3) of the 24-hour PM10 criterion - this minor exceedence was reasonably attributed to offsite road works - the annual average deposited dust level did not exceed the criterion. Lynwood Quarry Annual Environmental Review, September 2016 - there were no exceedances of TSP, 24-hour and annual PM10, deposited dust criteria.	Compliant	
					Lynwood Quarry Annual Environmental Review, September 2017 - there were no exceedances of TSP, 24-hour and annual PM10, deposited dust criteria. Holcim advised DPE of a number of individual dut deposition results that exceeded relevant criterion. However, these were not annual average results, and their purpose was to keep the DPE informed about ongoing monitoring and mitigation measures on-site. INX Community Complaint Report dated 21 September 2017 was directly related to dust emissions from site (due to general operations and blasting activities). Immediate action was taken to resolve the complaint. The INX Environment Report dated 5 January 2017 noted that one PM10 monitor was moved on 29 December 2016, and that technical difficulties led to samples not being taken as they should have been. Immediate action was taken to resolve issue.		
			Table 6: Long term impact assessment criteria for particulate matter				

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA60			Total suspended particulate (TSP) matter, Averaging period: Annual, Criterion 90 ug/m3	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Fortnightly monitoring results: - Environmental_Monitoring_171001-171015 - Environmental_Monitoring_171016-171031 - Environmental_Monitoring_171101-171115 - Environmental_Monitoring_171116-171130 - environmental_monitoring_171201-171215 - environmental_monitoring_171216-171231 - environmental_monitoring_180101-180115	Averaging annual TSP recorded in 2014/2015, 2015/2016 and 2016/2017 AERs. The annual average was below the 90 ug/m3 criterion in all recorded instances. The fortnightly monitoring reports for the last three months of the audit period were examined as a sample of these reports. No exceedances were reported. However, some data was incorrectly entered (egg results for 25/10/17). Recommendation: Refer to (REC2).	Compliant	
DA61			Particulate matter < 10 µm (PM10)	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	Averaging annual PM10 is reported in the 2015, 2016 and 2017 AERs. The annual average was below the 30 ug/m3 criterion in all recorded instances.	Compliant	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
			Table 7: Short term impact assessment criteria for particulate matter				
DA62			Particulate matter < 10 µm (PM10) Averaging period: 24 hour Criterion 50 ug/m3	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Fortnightly monitoring results: - Environmental_Monitoring_171001-171015 - Environmental_Monitoring_171016-171031 - Environmental_Monitoring_171101-171115 - Environmental_Monitoring_171116-171130 - environmental_monitoring_171201-171215 - environmental_monitoring_171216-171231 - environmental_monitoring_180101-180115	Average and maximum 24-hour PM10 concentrations are reported in the 2015, 2016 and 2017 AERs. The annual average was below the 50 ug/m3 criterion in all recorded instances except for one sample (50.9 ug/m3) reported in the 2015 AER. This is a marginal exceedance and was attributed to road works adjacent to the high volume air sampler. This conclusion appears reasonable and there have been no subsequent exceedances. The 2015 AER reports that 19 scheduled samples were not collected. The 2016 AER reports that 2 scheduled samples were not collected. The 2016 AER does not report any samples that were not collected. Given this trend, no additional actions are recommended. The fortnightly monitoring reports for the last three months of the audit period were examined as a sample of these reports. No exceedances were reported. The 2017 AER (Figure 2) presents the air quality trend. The average daily PM10 concentration has generally increased as the quarry is developed and the disturbance area is increasing. The average concentrations are well below the criteria. However, the trend highlights that Holcim will need to continue to minimise dust generation. **No further actions are recommended.**	Non-compliant	Continue to monitor correct operation of high volume air samplers & report breakdown events if they occur Compile and update air quality trend graphs (minimum every 6 months or more frequently if required)to monitor effectiveness of air quality controls. Investigate alternative controls if results start to consistently trend above 2/3rds of the maximum limit **Target Completion**: Ongoing Status March 2020: Solar power source for HVAS1 has been upgraded & close out reported to DPIE & EPA. Results tracking summary updated to include reviews of test operations. Graphs for Dust Deposition results established. Dust Mangement Improvement Plan developed & being implemented (in consultation with the EPA).
			Table 8: Long term impact assessment criteria for deposited dust				
DA63			Deposited dust Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.1-1991: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Fortnightly monitoring results: - Environmental_Monitoring_171001-171015 - Environmental_Monitoring_171016-171031 - Environmental_Monitoring_171101-171115 - Environmental_Monitoring_171116-171130 - environmental_monitoring_171201-171215 - environmental_monitoring_171216-171231 - environmental_monitoring_180101-180115	Annual average dust deposition results are compliant, as discussed above. The fortnightly monitoring reports for the last three months of the audit period were examined as a sample of these reports. No exceedances were reported. However, some data was incorrectly entered (eg results for 25/10/17). **Recommendation: Refer to (REC2).**	Compliant	

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
	Operating Conditions (Incorporates OEH GTA)						
		13	The Applicant must:				
DA64		13 (a)	(a) implement best practice management to minimise the dust emissions of the development;	Site observations. Lynwood Quarry Air Quality Management Plan (Umwelt, October 2016) Lynwood Quarry Blast Management Plan (Holcim, November 2016).	Site inspection identified various dust control measures including dust screens and dust sprinklers, and confining traffic to identified construction traffic routes. A. White confirmed that water carts are hired on hot windy days to minimise and control dust emissions.	Compliant	
DA65		13 (b)	(b) carry out periodic air quality monitoring to determine whether the development is complying with the relevant conditions of this consent;	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Fortnightly monitoring results: - Environmental_Monitoring_171001-171015 - Environmental_Monitoring_171016-171031 - Environmental_Monitoring_171101-171115 - Environmental_Monitoring_171116-171130 - environmental_monitoring_171201-171215 - environmental_monitoring_171216-171231 - environmental_monitoring_180101-180115		Compliant	
DA66		13 (c)	(c) regularly assess meteorological and air quality monitoring data and relocate, modify and/or stop operations on site to ensure compliance with the air quality criteria in this consent;	Site interviews Lynwood Quarry Air Quality Management Plan (Umwelt, October 2016)	The Air Quality Management Plan Section 4.2 (Operation Controls) includes: daily assessment of meteorological conditions to enable construction/operation activities to be modified to minimise dust generation). It was not windy on the day of the site inspection. However, A. White confirmed there was one very hot, dry and windy day in the audit period where operations had to cease in order to control dust emissions.	Compliant	
DA67		13 (d)	(d) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events; and	Site interviews Lynwood Quarry Air Quality Management Plan (Umwelt, October 2016)	See row above.	Compliant	
DA68		13 (e)	(e) minimise the area of surface disturbance and maximise progressive rehabilitation of the site.	Site observations.	The site was being established during the audit period. Some rehabilitation of construction areas and stockpiles has started.	Compliant	
			to the satisfaction of the Secretary.				
	Quarry-owned Land						
DA69		14	The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria in Tables 6-8 at any occupied residence on quarry-owned land unless;	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	Only one tenant resides on Holcim land, close to the Johnnifields Quarry. Dust deposition gauge 2 is about half way between the quarry and this residence. A high average deposited dust level was recorded at this site in the 2016 AER. However as stated in regards to Schedule 3, Condition 13(a), Holcim is implementing best practice measures to minimise dust emissions.	Compliant	
DA70		14 (a)	(a) the tenant has been notified of any health risks associated with such exceedances in accordance with the notification requirements under Schedule 4 of this consent; and	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	Only one tenant resides on Holcim land, close to the Johnnifields Quarry, east of Lynwood Quarry. Health-based air quality criteria have not been exceeded at the high volume air sampler on the eastern side of the quarry (HVAS 2).	Not triggered	
DA71		14 (b)	(b) the tenant of any land owned by the Applicant can terminate their tenancy agreement without penalty at any time, subject to giving reasonable notice,	-		Not triggered	
			to the satisfaction of the Secretary.				
	Air Quality Management Plan						

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
		15	The Applicant must prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. In addition to the standard requirements for management plans (see condition 2 of Schedule 5) this plan must:				
DA72		15 (a)	(a) be submitted to the Secretary for approval by 30 November 2016, unless otherwise agreed by the Secretary;	Lynwood Quarry Air Quality Management Plan (October 2016). Sighted DPE letter to Holcim dated 5 December 2016 approving Lynwood Quarry Air Quality Management Plan.	The DPE letter notes DPE's satisfaction with air quality monitoring suite.	Compliant	
DA73		15 (b)	(b) be prepared in consultation with the EPA;	Lynwood Quarry Air Quality Management Plan (October 2016)	The Air Quality Management Plan Section 1.5 states that it was prepared in consultation with the EPA and recommendations from EPA have been incorporated in the plan.	Compliant	
DA74		15 (c)	(c) describe the measures that would be implemented to ensure: • compliance with the relevant conditions of this consent; • best practice management is being employed; and • the air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events;	Lynwood Quarry Air Quality Management Plan (October 2016)		Compliant	
DA75		15 (d)	(d) describe the proposed air quality management system; and	Lynwood Quarry Air Quality Management Plan (October 2016)	The Air Quality Management Plan Section 4.0 describes engineering and operational controls.	Compliant	
DA76		15 (e)	(e) include an air quality monitoring program that: • is capable of evaluating the performance of the development; • includes a protocol for determining any exceedances of the relevant conditions of consent; • effectively supports the air quality management system; and • evaluates and reports on the adequacy of the air quality management system.	Lynwood Quarry Air Quality Management Plan (October 2016)	The Air Quality Management Plan Section 5.0 describes monitoring.	Compliant	
DA77			The Applicant must implement the management plan as approved from time to time by the Secretary.	Lynwood Quarry Air Quality Management Plan (October 2016) Site observations.		Compliant	
	METEOROLOGICAL MONITORING (Incorporates OEH GTA)						
DA78		15A	For the life of the development, the Applicant must ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline.	Lynwood Quarry Air Quality Management Plan (October 2016)	A meteorological station is installed at Lynwood Quarry in accordance with the requirements of this condition. The data is used to assess dust related compliance or complaints, and to assist proactive air quality/dust controls and management Air Quality Management Plan Section 5.3. The station uses telemetry to provide realtime site weather data.	Compliant	
	Greenhouse Gas Emissions						
DA79		15B	The Applicant must implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site.	Site interviews.	There are a number of energy-saving programs on site including automatic lights. Holcim reports to the Department of the Environment and Energy - National Pollution Inventory (NPI) with a list of all emissions leaving the site. Management of greenhouse gas emissions is not mentioned in Holcim's Lynwood Quarry Air Quality Management Plan (October 2016), of the AERs.	Compliant	
	SURFACE AND GROUND WATER (Incorporates NOW and OEH GTAs)						

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA80			*Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Applicant is required to obtain the necessary water licences for the development.*	-	Groundwater is not extracted at the site. Water is not extracted from water courses.	Note	

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
	Pollution of Waters						
DA81		16	Except as may be expressly provided by a License, the Applicant must comply with section 120 of the Protection of the Environment Operations Act 1997 during the carrying out of the development.	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	The 2015 AER section 7.0 (Water Management) notes that the Type C dam described in the EIS and water management plan would be insufficient to treat the fine sediments expected to run off the catchment area. An alternative dam construction was completed to meet compliance. In this reporting period, there were two overflow events. Investigation led to multiple corrective actions which were accepted by the EPA. The 2016 AER section 7.0 (Water Management) provides the surface water and groundwater data results for the 2015-2016 period. There was one dam spill resulting from above the 90th percentile rain event. Full compliance was met for freeboard requirements before the event occurred. The 2017 AER section 7.0 (Water Management) provides surface water and groundwater data results for the reporting period. Section 12.0 (Incidents and non-compliance) summarises a 1,500-2,000 L diesel spill caused by train fuelling on site. All contamination was contained on site without any harm caused to the receiving environment. Due diligence reporting continued for 6 months. No further actions are recommended.	Non-compliant	Continue to operate site in accordance with its approved Water Management Plan. Secure approval for updated plan as soon as possible **Target Completion**: Ongoing for management, July for approval of revised plan Status March 2020: Water Management Plan is being redrafted. Revised document expected to be lodged with DPIE in March / April 2020.
	Water Discharge Limits						
DA82		17	Except as may be expressly provided by a License, the Applicant must ensure that any controlled discharge from the controlled discharge points at Sediment Dams A to F comply with the limits in Table 10. **Table 10: Surface Water Discharge Limits** Pollutant: Unit of measure: 100 Percentile concentration limit Total Suspended Solids: 50 mg/L pH: 6.5-8.5 Oil & Grease: 10 mg/L or none visible.	Site observations. Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	In NSW Department of Primary Industry - Fisheries response to the auditor's request for comments they raised concern related to degradation of downstream water quality and aquatic habitats resulting from sediment and pollutants leaving the quarry working and passing into downstream waterways including "Lockeyersleigh Creek, Joarimin Creek and the Wollondilly River." AER reports for the audit period show that while most TSS and pH values are within the criteria, there have been some minor exceedances. 2005 EIS: Appendix 8, section 4.4.2.2: "Flocculation will be used to ensure that sediment loads from the site are not increased from the existing situation and that overflows have suspended sediments at concentrations of less than 50 mg/L." The 2016 AER states that Holcim has planted tubestock in riparian area of Joaramin Creek. The plantings are intended to stabilise the riparian areas in the Joaramin Creek through extensive tree planting. It is expected this will in time reduce the level of sediments entering the waterways.	Non-compliant	Develop plan to continue with tree planting to stabilise the creek banks across the site in a co-ordinated manner. Continue to operate site in accordance with its approved Water Management Plan. Secure approval for updated plan as soon as possible **Target Completion**: Ongoing for management, July for approval of revised plan Status March 2020: Water Management Plan is being redrafted. Revised document expected to be lodged with DPIE in March / April 2020. With lack of rainfall in 2019 erosion has not been an issue. Planning to undertake further bank stabilisation works still needs to occur.
					Surface water data in AER reports for the audit period states oil and grease were tested and were within parameters of the site's water management plan. Appendix 8, section 4.4.2.2: "Oil separators will be placed downstream from high traffic areas". "Flotation curtains will be placed at the outlets of all dams in order to protect downstream water quality in the event of oil spillage." **Recommendation (REC4): water quality monitoring should continue in accordance with the Water Management Plan (July 2018) and the EPL.**		
			Note: For more information on the location of Sediment Dams A to F see Appendix 4.	-		Note	
	Sediment Dams						
DA83		18	The Applicant must ensure that:				

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA84		18 (a)	(a) Sediment Dams A, B and F are capable of treating the 90th percentile 5 day rainfall event; and	Letter from GHD to Holcim, 21 May 2012. Lynwood Quarry Water Management Plan (July 2018)*.	Letter from GHD to Holcim states that the dams are designed to Blue Book standards, as described in the EIS and water management plan, but would be insufficient to treat the fine sediments expected to run off the catchment area. An alternative dam construction was completed to meet compliance. In this reporting period there were 2 overflow events. Investigation led to multiple corrective actions which were accepted by the EPA. Table 4.1, Existing Site Dams, in the Water Management Plan (July 2018) states that Dam F has a 90th percentile 5 day rainfall event type D/F as per Design Criteria specified for sediment control dams in with the Blue Book. Recommendation (REC5): The Water Management Plan should be updated so that it explicitly states that Sediment Dams A and B are cable of treating the 90th percentile 5 day rainfall event. In addition it states that dams that are yet to be constructed - Dam R1 and Dam R2 - will be capable of treating 90th percentile 5 day rainfall event type D/F. Likewise, sediment Dam G1 which is yet to be constructed will also be capable of treating 95th percentile 5 day rainfall event type D/F.	Compliant	
DA85		18 (b)	(b) Sediment Dams C, D and E are capable of treating the 1:20 year ARI Critical Duration Storm Event.	Letter from GHD to Holcim, 21 May 2012. Water Management Plan (July 2018)*.	Letter from GHD to Holcim states that the dams are designed Blue Book standards. 2014/2015 AER section 7.0 water management notes that the Type C dam described in the EIS and water management plan would be insufficient to treat the fine sediments expected to run off the catchment area. An alternative dam construction was completed to meet compliance. In this reporting period there were 2 overflow events. Investigation led to multiple corrective actions which were accepted by the EPA. Water Management Plan (July 2018) notes in Section 4.2.1.1 "The installed catch drains have been designed to safely convey peak discharge from critical duration 20 year Average Recurrence Interval (ARI) storm events and will provide a minimum of 0.5 metre freeboard." Additionally, Table 4.1, Existing Site Dams, in the Water Management Plan states that Dams C, D and E the following minimum design criteria - "Type C critical storm duration" in accordance with the Blue Book.	Compliant	
DA86			Notes: • *Locations of the Sediment Dams referred to in this condition are shown on the plans in Appendix 4;* • Dams must be designed to be in accordance with '*Managing Urban Stormwater: Soils and Construction (the Blue Book)'*, including Volume 1 (Landcom, 2004) and Volume 2 (OEH, 2008).	Sighted letter from GHD to Holcim on 21/5/12 which states that the dams are designed Blue Book standards. Water Management Plan (July 2018).		Compliant	
	Operating Conditions						
		19	The Applicant must:				
DA87		19 (a)	(a) ensure that the water collected in the Sediment Dams is pumped to the supply dams as soon as practicable;	Water Management Plan (July 2018)*	The Water Management Plan (July 2018), Section 4.2.1 notes "The sediment dams will be emptied using a pump and pipe or gravity system after rainfall events. Coagulant may be added to the dams in order to assist in lowering total suspended solids. Holcim has consulted with the EPA and DP&E and both agencies have approved this system." Recommendation (REC6): It is recommended that the Water Management Plan is updated so that it explicitly states that water from sedimentation dams is pumped to supply dams.	Compliant	
DA88		19 (b)	(b) ensure that the accumulated sediment in all the Sediment Dams is kept below 30% of their design capacity;	Audit observations - sighted sediment removal from Dam E. Water Management Plan (July 2018)*	Water Management Plan (July 2018), Section 4.2.1 notes "All sediment dams will be managed to ensure that accumulated sediment is kept below 30 per cent of the dam design capacity."	Compliant	

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA89		19 (c)	(c) construct impervious bunds around all fuel, oil, chemical storage areas that are large enough to contain 110% of the volume held in the largest container in accordance with the requirements in the OEH Bunding and Spill Management manual; and	Site observations.	Site observations indicated that all oil, chemical storage areas are large enough and comply with requirements in this condition. During the audit, one blue storage drum was observed close to the stormwater drain (see photograph provided in report). Although stored on concrete, it was not in a bunded area and was easy to knock over. Recommendation (REC7): all that drums (and any other chemical storage containers) are stored in approriately bunded areas at all times.	Non-compliant	Review drum storage facilities & upgrade as needed **Target Completion**: Review by June '19, any additional works by June '20 Status March 2020: Facilities reviewed & found adequate storage is available. Housekeeping regime implemented & one person assigned responsibility for managing storage of oil drums.
DA90		19 (d)	(d) not use any flocculants on site for water pollution control treatment without the written approval of OEH.	Water Management Plan (July 2018)*	Water Management Plan (July 2018) Section 4.2.1 notes "Coagulant may be added to the dams in order to assist in lowering total suspended solids. Holcim has consulted with the EPA and DP&E and both agencies have approved this system."	Compliant*	
DA91			*Note: The EIS indicated that flocculants maybe used for the treatment of collected stormwater. While the specific flocculent was not specified, some types of flocculants have the potential to cause ecotoxicological impacts on receiving waters.*	-		Note	
DA92	19A	19A	The Applicant must ensure it has sufficient water for all stages of the development, and if necessary, adjust the scale of operations to match the licensed water entitlements, to the satisfaction of the Secretary.	Water Management Plan (July 2018)*	Water Management Plan (July 2018) section 3.0, site water balance, outlines water demands, water supply and storage, site water balance, external water sourcing, water minimisation and annual water balance review - indicating that Holcim has adequate mechanisms in place to monitor and adjust the scale of operations to match licenced water entitlements.	Compliant	
	Management and Monitoring						
		20	The Applicant must prepare a Water Management Plan for the development to the satisfaction of the Secretary. In addition to the standard requirements for management plans (see condition 2 of Schedule 5) this plan must:				
DA93		20 (a)	(a) be prepared in consultation with the EPA, WaterNSW, DPI Water and DPI Fisheries;	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Holcim has consulted with all relevant agencies in preparing the 2018 Water Management Plan*. Holcim received comments and now needs to resubmit the draft version once more before finalising (as confirmed by A. White during site audit interviews).	Compliant	
DA94		20 (b)	(b) be submitted to the Secretary for approval by 30 November 2016, unless otherwise agreed by the Secretary;	Correspondence with DPE dated 12 February 2017	Correspondence with DPE dated 12 February 2017 advised Holcim that the Water Management Plan will need to be revised, and that DPI Fisheries need to undertake a second review. The latest version of the Water Management Plan (July 2018) was emailed to DPI Fisheries for review on 17 July 2018 and Holcim is waiting for a response.	Compliant	
DA95		20 (c)	(c) include a Water Balance;	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Section 3. Water Management Plan (2016) Section 3. Water Management Plan (July 2018) Section 3.6	Compliant	
DA96		20 (d)	(d) include an Erosion and Sediment Control Plan;	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Section 4. Water Management Plan (2016) Section 4. Water Management Plan (July 2018) Section 4.	Compliant	
DA97		20 (e)	(e) include a Surface Water Monitoring Program;	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Appendix 2: Surface Water Monitoring Program Water Management Plan (2016) Appendix 2: Surface Water Monitoring Program Water Management Plan (July 2018) Appendix 2: Surface Water Monitoring Program	Compliant	

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA98		20 (f)	(f) include a Ground Water Monitoring Program; and	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2016) Appendix 3: Groundwater Monitoring Program. Water Management Plan (2016) Appendix 3: Groundwater Monitoring Program Water Management Plan (July 2018) Appendix 2: Surface Water Monitoring Program	Compliant	
DA99		20 (g)	(g) include a Surface and Ground Water Response Plan to address any potential adverse impacts associated with the development.	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Section 6 Water Management Plan (2016) Section 6 Water Management Plan (July 2018) Appendix 2: Surface Water Monitoring Program Section 6	Compliant	
DA100			The Applicant must implement the management plan as approved from time to time by the Secretary.	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)* Site observations		Compliant	
		21	The Water Balance must:				
DA101		21 (a)	(a) include details of all water extracted (including water make), dewatered, transferred, used and/or discharged by quarry; and	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Section 3.0 Water Management Plan (2016) Section 3.0 Water Management Plan (July 2018) Sections 3.2 to 3.4	Compliant	
DA102		21 (b)	(b) describe measures to minimise water use by the development.	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Section 3.5 Water Management Plan (2016) Section 3.5 Water Management Plan (July 2018) Sections 3.1	Compliant	
		22	The Erosion and Sediment Control Plan must:	Water Management Plan (July 2018)*	Water Management Plan (July 2018) Sections 3.1		
		22	The Erosion and Sediment Control Plan must:				
DA103		22 (a)	(a) be consistent with the requirements of the Landcom's *Managing Urban Stormwater: Soils and Construction manual;*	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Section 4.0 Water Management Plan (2016) Section 4.0 Plans outline controls that are designed and constructed to a standard consistent with Landcom's Managing Urban Stormwater - Soils and Construction Manual, Volume 1 (the Blue Book) Water Management Plan (July 2018) Section 4.0	Compliant	
DA104		22 (b)	(b) identify activities that could cause soil erosion and generate sediment;	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Section 4.0 Water Management Plan (2016) Section 4.0 Plans include activities that have the potential to cause erosion and generate sediment on site. Water Management Plan (July 2018) Section 4.0.	Compliant	
DA105		22 (c)	(c) describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters;	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Section 4.0 Water Management Plan (2016) Section 4.0 Plans Section 4.0 include activities that have the potential to cause erosion and generate sediment on site.	Compliant	
DA106		22 (d)	(d) describe the location, function, and capacity of erosion and sediment control structures; and	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	The Water Management Plan (2016) plan has been updated to reflect project changes. The Water Management Plan (July 2018) was updated to reflect the further project changes.	Compliant	

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DA107		22 (e)	(e) describe what measures would be implemented to maintain (and if necessary decommission) the structures over time.	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Section 7.0 Water Management Plan (2016) Section 7.0 Water Management Plan (July 2018) A brief description of maintenance and decommissioning is provided.	Compliant	
		23	The Surface Water Monitoring Program must include:				
DA108		23 (a)	(a) detailed baseline data on surface water flows and quality in Joarimin Creek, Lockyersleigh Creek, and Marulan Creek;	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Appendix 2: Surface Water Monitoring Program Section 2.0 Water Management Plan (2016) Appendix 2: Surface Water Monitoring Program Section 2.0 Water Management Plan (July 2018) Appendix 2: Surface Water Monitoring Program Section 2.0	Compliant	
DA109		23 (b)	(b) surface water impact assessment criteria;	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Appendix 2: Surface Water Monitoring Program Section 3.0 Water Management Plan (2016) Appendix 2: Surface Water Monitoring Program Section 3.0 Water Management Plan (July 2018) Appendix 2: Surface Water Monitoring Program	Compliant	
DA110		23 (c)	(c) a program to monitor surface water flows and quality;	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Appendix 2: Surface Water Monitoring Program Section 4.0 Water Management Plan (2016) Appendix 2: Surface Water Monitoring Program Section 4.0 Water Management Plan (July 2018)* Appendix 2: Surface Water Monitoring Program	Compliant	
DA111		23 (d)	(d) a protocol for the investigation of identified exceedances of the surface water impact assessment criteria; and	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Appendix 2: Surface Water Monitoring Program Section 5.0 Water Management Plan (2016) Appendix 2: Surface Water Monitoring Program Section 5.0 Water Management Plan (July 2018) Appendix 2: Surface Water Monitoring Program	Compliant	
DA112		23 (e)	(e) a program to monitor the effectiveness of the Erosion and Sediment Control Plan.	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Appendix 2: Surface Water Monitoring Program Section 6.0 Water Management Plan (2016) Appendix 2: Surface Water Monitoring Program Section 6.0 Water Management Plan (July 2018) Appendix 2: Surface Water Monitoring Program	Compliant	
			Note: Monitoring of surface flows to be completed by visual assessment.	-		Note	
		24	The Ground Water Monitoring Program must include:				
DA113		24 (a)	(a) detailed baseline data on ground water levels, flows, and quality, based on statistical analysis;	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Appendix 3: Groundwater Monitoring Program Section 2.0 Water Management Plan (2011) Appendix 3: Groundwater Monitoring Program Section 2.0 Water Management Plan (July 2018) Appendix 3: Groundwater Monitoring Program	Compliant	

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA114		24 (b)	(b) groundwater impact assessment criteria for monitoring bores;	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Appendix 3: Groundwater Monitoring Program Section 3.0 Water Management Plan (2011) Appendix 3: Groundwater Monitoring Program Section 3.0 Water Management Plan (July 2018) Appendix 3: Groundwater Monitoring Program	Compliant	
DA115		24 (c)	(c) a program to monitor regional ground water levels and quality; and	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Appendix 3: Groundwater Monitoring Program Section 4.0 Water Management Plan (2011) Appendix 3: Groundwater Monitoring Program Section 4.0 Water Management Plan (July 2018) Appendix 3: Groundwater Monitoring Program	Compliant	
DA116		24 (d)	(d) a protocol for the investigation of identified exceedances of the groundwater impact assessment criteria.	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Appendix 3: Groundwater Monitoring Program Section 5.0 Water Management Plan (2011) Appendix 3: Groundwater Monitoring Program Section 5.0 Water Management Plan (July 2018) Appendix 3: Groundwater Monitoring Program	Compliant	
DA117			*Note: The surface and ground water monitoring programs must be consistent with the current version of Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales (OEH).*	Water Management Plan (2011) Water Management Plan (2016) Water Management Plan (July 2018)*	Water Management Plan (2011) Appendix 2: Surface water Monitoring Program Section 4.1 (Monitoring Standards) states hat groundwater monitoring at Lynwood Quarry will be undertaken in accordance with the required method, as per this condition. Water Management Plan (2011) Appendix 3: Groundwater Monitoring Program Section 5.1 (Monitoring Standards) states that groundwater monitoring at Lynwood Quarry will be undertaken in accordance with the required method, as per this condition. Water Management Plan (July 2018) Appendix 3: Groundwater Monitoring Program	Compliant	
	Waterway Crossings						
DA118		25	The vehicular crossing of Lockyersleigh Creek as detailed in EA (Mod 4) must be designed and constructed in accordance with the *Policy and Guidelines for Fish Friendly Water Crossings* (DPI Fisheries, 2004) and *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (2004) to the satisfaction of DPI Fisheries. Design plans should be submitted to DPI Fisheries for approval prior to the construction.	-	There is no evidence that design plans were submitted to DPI Fisheries for approval prior to the construction of the vehicular crossing of Lockyersleigh Creek. **Recommendation (REC8): DPI Fisheries is consulted regarding the suitability of the vehicular crossing of Lockyersleigh Creek.**	Non-compliant	Since the completion of the Audit Report correspondance has been located to confirm this in fact did occur (email dated 01.11.2016)
	TRAFFIC AND TRANSPORT (Incorporates RTA, Council and Department of Lands GTAs)						
	Construction Traffic						
DA119		26	The Applicant must ensure that:				
DA120		26 (a)	(a) construction traffic on the temporary construction access is kept to a minimum;	Site observations (2014).	Construction/commissioning phase completed on 5 October 2015.	Compliant	
DA121		26 (b)	(b) no construction traffic uses the temporary construction access once the proposed bridge over the Main Southern Railway Line has been commissioned;	Site observations (2014).	Construction/commissioning phase completed on 5 October 2015. The bridge was commissioned and the temporary construction access road gated and locked in the first months of the audit period.	Compliant	
DA122		26 (c)	(c) all other traffic uses the construction site access prior to the commissioning of the proposed Hume Highway Interchange; and	Site observations (2014).	Access road used as other access option, Stoney Creek Rd, is now locked.	Compliant	
DA123		26 (d)	(d) where practicable, no heavy vehicle construction traffic movements occur on George Street during school zone times (ie between 8:00am to 9:30am and 2:30pm to 4:00pm on school days);	Holcim Construction Traffic Management Plan (Rev 2)	Construction/commissioning phase completed on 5 October 2015.	Compliant	

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA124		26 (e)	(e) heavy vehicle construction traffic using George Street does not exceed 40kph; and	Site observations (2014)	40 kph road signs on traffic control plans in Holcim traffic management plan. Signs observed during previous audit inspection.	Compliant	
DA125		26 (f)	(f) no traffic uses the construction site access once the proposed Hume Highway Interchange has been commissioned.	Site observations	The Hume Highway Interchange is used exclusively to access the site.	Compliant	
DA126			*Note: The temporary construction access routes are shown in Appendix 5. The requirements of this condition are to be reflected in the Construction Traffic Management Plan required under Condition 28 below.*	-		Note	
DA127		27	Prior to the commissioning of the proposed Hume Highway Interchange, the Applicant shall maintain the public roads on the construction access routes, or pay all reasonable cost associated with maintaining these roads during the period these roads are used for construction access, to the satisfaction of Council and/or the Department of Lands.	Sighted Holcim Construction Traffic Management Plan (Rev 2), emails from S. Mitchell to T. Cooper at Goulburn Council in December 2011 requesting road repairs during last audit period.		Compliant	
DA128		28	Prior to carrying out any development, the Applicant must prepare (and following approval implement) a Construction Traffic Management Plan for the development, in consultation with the RMS, Council and the Department of Lands, and to the satisfaction of the Secretary. This plan must: (a) include a Road Dilapidation Report of the public roads on the construction access routes; and (b) describe what measures would be implemented to: • maintain the public roads; • minimise the potential noise and safety impacts associated with the construction traffic; and • keep the community informed of any traffic disruptions that would be caused by the development.	Letter from Director-General DP&I approving construction traffic management plan (4/4/2012) Letter from Goulburn-Mulwaree Council (3/11/2010), letter from RTA (27/10/2010)		Compliant	
	Hume Highway Interchange						
		29	The Applicant must:				
DA129		29 (a)	(a) design and construct the proposed grade separated intersection at the existing junction of the Hume Highway (SH2) and Marulan South Road/Jerrara Road; and following the satisfactory completion of this development,	Site observations. RTA Major Works Authorisation Deed Private Financing of Construction March 2008 (211396379-1).		Compliant	
DA130		29 (b)	(b) close the existing median and proclaimed access point on the Hume Highway, to the satisfaction of the RTS.	Site observations Letter from Road Traffic Authority to Holcim (10/9/12)		Compliant	
DA131			*Notes:* *• The design of these works must be in accordance with relevant RMS standards and specifications:* *- geometric road design in accordance with RMS Road Design Guide;* *- pavement design in accordance with the AUSTROADS Pavement Design Guide;* *- bridge design in accordance with Australian Standard AS5100; and* *- grade separated interchange in accordance with NAASRA (AUSTROADS) Grade Separated Interchanges – A Design Guide.*			Note	
DA132			*• The Applicant will be required to meet all the costs associated with this development, including design, land acquisitions, gazettal of new boundaries and access point, construction and project management.*	Site interviews (previous audit)	There were no disputes or non payments	Not triggered	

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DA133			*• If other quarries or developments are approved that use this intersection, the applicants for such developments may be required to contribute to the cost of constructing the intersection, pro-rata on maximum usage rates. The Applicant must keep detailed records of the intersection design and construction costs and provide this information to the Secretary if requested to assist in levying costs on any such developments.*	-		Note	
DA134		30	Prior to carrying out any development in the Hume Highway road reserve, the Applicant must prepare a Traffic Management Plan for the proposed development in the road reserve to the satisfaction of the RMS.	Appendix R of BMD Interchange CEMP		Compliant	
	Crown Roads/Land						
DA135		31	The Applicant must not carry out any development on Crown roads or land without the written approval of the Department of Lands.	RTA approval #211396379-1 (S. Liganaarachchi, RTA Project Manager 10/6/2011)		Compliant	
	Road Haulage						
DA136		32	The Applicant must ensure that all loaded vehicles entering or leaving the site are covered at all times.	Site observations.		Compliant	
DA137		33	The Applicant must ensure that all loaded vehicles leaving the site are cleaned of materials that may fall on the road before they are allowed to leave the site.	Site observations. INX Community Complaint Report dated 27 November 2017	No quarry materials were observed on sealed roads. There were no recorded complaints regarding materials on public roads.	Compliant	
	Monitoring of Quarry Product Transport						
DA138		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.	Lynwood Quarry Annual Environment Review, March 2017. Lynwood Monthly Sales, Confidential Report spreadsheet.	2017 AER 2016/2017 Table 4 (Summary of Operations) provides a summary of product transported total, by rail and truck) and Table 5 provides production within the reporting period . EMM audit team sighted spreadsheet called Lynwood Monthly Sales Confidential Report which included product transported from site.	Compliant	
	Protection of Aboriginal Sites						
DA139		34	The Applicant must ensure that the development does not cause any direct or indirect impact on identified Aboriginal sites located outside the approved disturbance area of the development. Only those Aboriginal sites identified within the approved Aboriginal Cultural Heritage Management Plan (see condition 35) or any approved Aboriginal Heritage Impact Permit may be impacted within the approved disturbance area of the development.	Caring for Country, Lynwood Quarry Aboriginal Heritage Management Plan, Rev 2 (2011). Site observations. Review of DigitalGlobe satellite image against Appendix 2 (Development Layout). Holcim letter to DPE dated 15 June 2017, re: Lynwood Quarry Extraction Area Modification Stage 1 Archaeological Salvage Program - Notification of Status of LKAS7, LKST1 and LKST2	Exclusion fencing with appropriate signage observed. Some Aboriginal sites have not been fenced, as per the Holcim letter to DPE dated 15 June 2017.	Compliant	
	Aboriginal Cultural Heritage Management Plan						
DA140		35	The Applicant must prepare an Aboriginal Cultural Heritage Management Plan for the development to the satisfaction of the Secretary. The plan must:	Caring for Country, Lynwood Quarry Aboriginal Heritage Management Plan, Rev 2 (2011). Draft Lynwood Quarry Aboriginal Heritage Management Plan (July 2018)* Correspondence with DPE and OEH regarding Lynwood Quarry Aboriginal Heritage Management Plan (8 August 2018, 13 September 2018).	Sighted Holcim's email to OEH and DPE (dated 8 August 2018) regarding the finalised Lynwood Quarry Aboriginal Heritage Management Plan (2018). A link to the plan was provided to both agencies. Holcim is still awaiting OEH comments, DPE has confirmed that they are in the process of reviewing the plan.	Compliant*	
DA141		35 (a)	(a) be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary;	DPE Letter of 5 December 2016	DPE's letter of 5 December 2016 endorses the appointment of Jan Wilson, Principal Archaeologist Umwelt to prepare the updated (2018) ACHMP.	Compliant	

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA142		35 (b)	(b) be prepared in consultation with OEH and local Aboriginal stakeholders;	Caring for Country, Lynwood Quarry Aboriginal Heritage Management Plan, Rev 2 (2011). Letter to DPE (dated 3 January 2017) regarding Aboriginal Heritage Management Plan). Letter to OEH (dated 15 June 2017) regarding agreed management commitments, current status of site, commencement of work notification and consultation participants. Memorandum of Understanding between Holcim (Australia) Pty Ltd and Lynwood Quarry Aboriginal Heritage Management Committee dated 15/16/17 May 2017. Lynwood Quarry Aboriginal Heritage Management Plan (July 2018)*.	Sighted Section 1.3 of the Lynwood Quarry Aboriginal Heritage Management Plan (July 2018) "This revised AHMP was developed in consultation with the Registered Aboriginal Parties with a draft provided on 6 January 2017." The section summarised key meeting dates with Aboriginal stakeholders.	Compliant*	
DA143		35 (c)	(c) be submitted to the Secretary for approval by 30 November 2016, unless the Secretary agrees otherwise;	DPE Letter of 29 November 2017	Sighted DPE's letter to Holcim's Lynwood quarry environmental representative A. White, re: request for extension to date for submission of Aboriginal Cultural Heritage Management Plan (ACHMP). Secretary agrees to Holcim's request for an extension, ACHMP can be submitted by 15 January 2018. The draft has subsequently been submitted.	Compliant*	
DA144		35 (d)	(d) include the following; • a Conservation Management Plan that details how the Cultural Heritage Management Zones (shown conceptually on the plan in Appendix 6) are managed;	Caring for Country, Lynwood Quarry Aboriginal Heritage Management Plan, Rev 2 (2011). Site observations.	Sign-posted and cordoned-off cultural heritage management zones were observed during the audit inspection.	Compliant	
DA145			•a detailed archaeological salvage program for Aboriginal sites/objects will be managed and protected; and	Caring for Country, Lynwood Quarry Aboriginal Heritage Management Plan, Rev 2 (2011).		Compliant	
			• a description of the measures that would be implemented for:				
DA146			protecting, monitoring and managing Aboriginal sites outside the approved disturbance area;	Caring for Country, Lynwood Quarry Aboriginal Heritage Management Plan, Rev 2 (2011).		Compliant	
DA147			maintaining and managing reasonable access for Aboriginal stakeholders to cultural heritage items on site;	Caring for Country, Lynwood Quarry Aboriginal Heritage Management Plan, Rev 2 (2011).		Compliant	
DA148			managing the discovery of any human remains or previously unidentified Aboriginal objects on site, including (in the case of human remains) stop work provisions and notification protocols;	Caring for Country, Lynwood Quarry Aboriginal Heritage Management Plan, Rev 2 (2011).		Compliant	
DA149			ongoing consultation with local Aboriginal stakeholders in the conservation and management of Aboriginal cultural heritage; and	Caring for Country, Lynwood Quarry Aboriginal Heritage Management Plan, Rev 2 (2011). Memorandum of Understanding (MOU) between Holcim (Australia) Pty Ltd and Lynwood Quarry Aboriginal Heritage Management Committee dated 16/17/18 May 2017 Holcim letter to OEH dated 15 June 2017 regarding Lynwood Quarry Extraction Area Modification Stage 1 Archaeological Salvage Program. DPE letter to Holcim dated 29 November 2016 regarding extension to submit updated Aboriginal Cultural Heritage Management Plan.	RAP Management Committee "will meet at least once every six months during the first three years of quarry. The meeting times may then move to annual meetings if all Management Committee members agree that this is appropriate." The MOU show's Holcim's commitment to establishing a Cultural Heritage Centre, the ongoing operation and funding of the Cultural Heritage Centre. The MOU was signed by a number of representatives from the Aboriginal community, Holcim and an archaeologist. Holcim letter to OEH shows evidence of engagement with Aboriginal communities relevant to the site. DPE's letter states "I note that Holcim has been actively engaging with Aboriginal stakeholders in the preparation of the revised ACHMP, particularly with regard to management of scar trees on site..."	Compliant	

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DA150			ensuring any workers on site receive suitable heritage inductions prior to carrying out any activities which may disturb Aboriginal sites, and that suitable records are kept of these inductions.	Training modules: ENV: Training and Awareness, and HAUS Introduction to Environmental Risk Management.	Site interviews indicated that all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this consent relevant to their respective activities via site inductions and the following training modules: ENV: Training and Awareness, and HAUS Introduction to Environmental Risk Management.	Compliant	
DA151			The Applicant must implement the management plan as approved from time to time by the Secretary.	-		Compliant	
DA152		36	*deleted*				
DA153		37	Unless the OEH approves otherwise, the Applicant must ensure that all ground disturbing works on the site are monitored at all times by a suitably qualified and experienced archaeologist and representatives of all the relevant Aboriginal community groups. If this monitoring detects any previously unrecorded Aboriginal objects not listed in Table 10, then the Applicant must immediately cease work in the area and notify the OEH.	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	Aboriginal heritage monitoring is described in each AER, including the condition of Aboriginal sites and management actions taken.	Compliant	
DA154			*Notes:* *• This monitoring only relates to topsoil stripping, not quarrying operations.* *• For safety reasons, topsoil stripping may be undertaken before the commencement of development.*	-		Note	
	Old Marulan Township						
DA155		38	The Applicant may carry out the development in the area identified in the State Heritage Register as the Old Marulan Township (SHR No. 00127) with the written approval of the NSW Heritage Council.	Previous audit evidence.	Original letter from NSW Heritage Council not sighted but ongoing correspondence from the council indicates that it approved development in Old Marulan Township (eg application to vary S 65A no 2007/S65/11. Confirmed by Heritage Branch 22/10/09)	Compliant	
DA156		39	Prior to seeking this approval, the Applicant must undertake a detailed investigation of the archaeological potential of the proposed development area in the Old Marulan Township, including archaeological testing, to the satisfaction of the NSW Heritage Council. This archaeological investigation must clarify the nature, extent, and significance of the relics in the proposed development area.	Old Marulan County Argyle: A research design and archaeological compliance program for work by Readymix (Gojak) 2006		Compliant	
DA157			*Note: The Applicant will be required to submit an application to the NSW Heritage Council under Section 60 of the Heritage Act 1977 for this archaeological investigation.*	-		Note	
DA158		40	In seeking this approval, the Applicant must submit the following information to the NSW Heritage Council:	-			
DA159		40 (a)	(a) the final design of the proposed Hume Highway interchange, incorporating the results of the archaeological investigations (see condition 39), and including information on landscaping, lighting, and stormwater management;	Non-indigenous archaeology assessment, Old Marulan County Argyle: A research design and archaeological compliance program for work by Readymix (Gojak) 2006		Compliant	
		40 (b)	(b) an Archaeological Assessment of the area to be impacted by the proposed interchange, that includes the:	-			
DA160			• nomination of an Excavation Director and archaeology team which will be approved by the Director of the NSW Heritage Office;	Sighted Old Marulan Archaeological Letter to DECC, S65_2009_65A_11 (27/10/10)*		Compliant	
DA161			• assessment of the significance of the archaeological remains to be impacted within the development area,	Non-indigenous archaeology assessment, Old Marulan County Argyle: A research design and archaeological compliance program for work by Readymix (Gojak) 2006		Compliant	

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA162			• plans and details of the location and depth of excavation works and assessment of the exact impact on potential archaeological remains;	Non-indigenous archaeology assessment, Old Marulan County Argyle: A research design and archaeological compliance program for work by Readymix (Gojak) 2006		Compliant	
DA163			• identification of research themes and identification of both site specific and general research questions,	Non-indigenous archaeology assessment, Old Marulan County Argyle: A research design and archaeological compliance program for work by Readymix (Gojak) 2006		Compliant	
DA164			• details of the proposed on-site excavation methodology including details on philosophical approach to on-site work and the process and procedures proposed for recovery and recording of archaeological data, and details on how the archaeological research is proposed to be satisfactorily completed,	Non-indigenous archaeology assessment, Old Marulan County Argyle: A research design and archaeological compliance program for work by Readymix (Gojak) 2006		Compliant	
DA165			• details of the proposed post-excavation methodology; and	Non-indigenous archaeology assessment, Old Marulan County Argyle: A research design and archaeological compliance program for work by Readymix (Gojak) 2006		Compliant	
DA166			• details of the Interpretation Plan for the entire Old Marulan Township precinct.	Non-indigenous archaeology assessment, Old Marulan County Argyle: A research design and archaeological compliance program for work by Readymix (Gojak) 2006		Compliant	
DA167		40A	The Applicant must prepare a structural integrity report for the Lockyersleigh Homestead Property and Garden, subject to receiving the landowner's agreement, by 30 June 2016.	A & R Engineering Design Pty Ltd condition report (structural integrity report) dated 22 June 2016.	A & R Engineering Design Pty Ltd condition report (structural integrity report) dated 22 June 2016 provides photographic records of building condition at Lockyersleigh Homestead and settlement compound 1437 Carrick Road Brayton.	Compliant	
	Operating Conditions						
DA168		41	The Applicant must ensure that:				
DA169		41 (a)	(a) the development does not have any impact on: • the archaeological remains within the former Lot 1, DP210885;	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Sighted application to vary S 65A no 2007/S65/11. Confirmed by Heritage Branch 7/9/09*	The AERs report on European Heritage. The 2017 AER reports "The Old Marulan European Heritage report was reviewed in the beginning of the reporting period for any outstanding actions. There are no outstanding commitments with respect to European Heritage".	Compliant	
DA170			• heritage items MRNH1, MRNH2, and MRNH3;	Sighted letter from Heritage Branch_SheepDipMRNH1_ArtefactPolicy_20090907a_ltr LTR_CWC_Cess Pit_Old Marulan_August 2011	These sites are adjacent to the Hume Highway intersection. There was no construction in this area in the audit period.	Compliant	
DA171			• the section of the State Heritage Register curtilage located at the eastern side of the Hume Highway, other than the impact upon the timber lined cistern/well (MRNH8) except where undertaken in accordance with the written approval of the NSW Heritage Council;	Site observations (2014).	These sites are adjacent to the Hume Highway intersection. There was no construction in this area in the audit period.	Compliant	
DA172		41 (b)	(b) as much fabric of the timber-lined cistern/well (MRNH8) and the archaeological remains uncovered through the archaeological excavation as possible is salvaged and incorporated as a key element in the interpretation of the site as part of the new development; and	Sighted letter from Heritage Branch_Well MRNH8_InterpPlan_20090305 which details approved specification, Old Marulan Archaeological_Letter to DECC 27 Oct 2010	These sites are adjacent to the Hume Highway intersection. There was no construction in this area in the audit period.	Compliant	

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA173		41 (c)	(c) the movement of machines across archaeologically sensitive areas is kept to a minimum.	Site observations. EIS 2005, Non-Indigenous Archaeology Assessment (Appendix 12 of the EIS) Figure 2.5. Review of DigitalGlobe satellite image against Appendix 2 (Development Layout) and Appendix 4 (Location of Sediment Dams) of the development consent.	Areas are well flagged and movements outside of quarry are confined to formed roadways.	Compliant	
	Archaeological Field Work/Excavations						
DA174		42	The Applicant must comply with the detailed requirements in Appendix 7 to the satisfaction of the NSW Heritage Office.	-	See Appendix 7 conditions detailed later in this table.	-	
	REHABILITATION AND LANDSCAPING						
DA175		43	The Applicant must rehabilitate the site in a manner that is generally consistent with the conceptual final landform in Appendix 8, to the satisfaction of the Secretary.	-		Not triggered	
	Rehabilitation and Landscape Management Plan						
DA176		44	Within 6 months of this consent, the Applicant must prepare (and following approval implement) a Rehabilitation and Landscape Management Plan for the development, in consultation with OEH, DPI Water and Council, and to the satisfaction of the Director-General. This plan must:	Rehabilitation and Landscape Management Plan (September 2016) (RLMP). Rehabilitation and Landscape Management Plan (2018) (RLMP). DPE letter to Holcim dated 11 July 2018 confirming approval of the RLMP*.		Compliant	
		44 (a)	(a) describe in general the short, medium, and long-term measures that would be implemented to:				
DA177			• rehabilitate the site;	Rehabilitation and Landscape Management Plan (September 2016).	Given the changes to the project, including incorporation of the granite pit, it is not appropriate to review the compliance of the project against the previous Sighted Rehabilitation and Landscape Management Plan (Rev 2), June 2011. Rather the September 2016 version of the plan has been used even though it had not been approved.	Compliant	
DA178			• implement the Habitat Management Area (shown conceptually in Appendix 9) unless this area is incorporated into a conservation area subject to a BioBanking agreement);	Rehabilitation and Landscape Management Plan (September 2016).	The Habitat Management Area shown in Figure 5.1 of the plan matches that in Appendix 9 of the Development Consent.	Compliant	
DA179			• replace cleared hollow-bearing trees with durable and appropriate nest boxes that reflect the type, size, usability and condition of the hollows to be cleared;	Rehabilitation and Landscape Management Plan (September 2016).		Compliant	
DA180			• manage the remnant vegetation and habitat on the site; and	Rehabilitation and Landscape Management Plan (September 2016).		Compliant	
DA181			• landscape the site to mitigate any visual impacts of the development;	Rehabilitation and Landscape Management Plan (September 2016).		Compliant	
DA182		44 (b)	include Riparian Area Management Plan/s (see condition 45) for those riparian areas to be disturbed in the next 5 years, excluding areas within quarry pits or emplacement areas as agreed with the Secretary;	Riparian Management Plan, Joarimin Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Lockyersleigh Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Marulan Creek Catchment Area, Rev 2, June 2011.		Compliant	
DA183		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;	Rehabilitation and Landscape Management Plan (September 2016).	The plan describes rehabilitation between 2016 and 2021.	Compliant	
DA184		44 (d)	describe how the performance of these measures would be monitored over time; and	Rehabilitation and Landscape Management Plan (September 2016).		Compliant	
DA185		44 (e)	set completion criteria for the rehabilitation of the site.	Rehabilitation and Landscape Management Plan (September 2016).		Compliant	

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DA186		45	The Riparian Area Management Plan/s must be prepared by a suitably qualified hydrologist; whose appointment has been approved by the Secretary, and include:	Letter from Director-General DP&I approving management plans (4/4/2012), which included Riparian Area Management Plans		Compliant	
DA187		45 (a)	baseline surveys of creeks, providing existing bed, bank and vegetation information (including representative cross and longitudinal sections), in the areas in which the development is located, excluding the quarry pits and emplacement areas;	Riparian Management Plan, Joarimin Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Lockyersleigh Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Marulan Creek Catchment Area, Rev 2, June 2011.		Compliant	
DA188		45 (b)	detailed designs of the proposed works, including any proposed stabilization, scour protection, and/or enhancement works (including representative cross and longitudinal sections);	Riparian Management Plan, Joarimin Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Lockyersleigh Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Marulan Creek Catchment Area, Rev 2, June 2011.		Compliant	
DA189		45 (c)	a description of the measures that would be implemented in the event of flooding during construction/rehabilitation.	Riparian Management Plan, Joarimin Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Lockyersleigh Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Marulan Creek Catchment Area, Rev 2, June 2011.		Compliant	
DA190		45 (d)	details of proposed staging of the works;	Riparian Management Plan, Joarimin Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Lockyersleigh Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Marulan Creek Catchment Area, Rev 2, June 2011.		Compliant	
DA191		45 (e)	completion criteria for the rehabilitation of the riparian area;	Riparian Management Plan, Joarimin Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Lockyersleigh Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Marulan Creek Catchment Area, Rev 2, June 2011.		Compliant	
DA192		45 (f)	a protocol for monitoring the performance of the rehabilitation over time.	Riparian Management Plan, Joarimin Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Lockyersleigh Creek Catchment Area, Rev 2, June 2011. Riparian Management Plan, Marulan Creek Catchment Area, Rev 2, June 2011.		Compliant	
DA193		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.	Rehabilitation and Landscape Management Plan (September 2016) (RLMP) Rehabilitation and Landscape Management Plan (2018) (RLMP)* DPE letter to Holcim dated 11 July 2018 confirming approval of the RLMP*	The second Independent Environmental Audit was finalised on 25 February 2015. The plan was not updated by 25 May 2015. However, project MOD4 was underway that resulted in the site being reconfigured. This plan has subsequently been updated and approved.	Non-compliant	Ensure timely completion & submission of Management Plan reviews **Target Completion**: Annual reviews required Status March 2020: Review of documents submitted to DPIE on 01.07.2019. Documents are progressively being revised by SLR. Air Quality Management Plan - Approved Environmental Management Strategy - Draft submitted, comments received & responded to Noise Management Plan - Draft submitted, comments received & responded to Blast Management Plan - Draft submitted, comments received & responded to
	Rehabilitation Bond						

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA194		47	Within 3 months of the first Independent Environmental Audit (see Condition 11 in Schedule 5), the Applicant must lodge a rehabilitation bond for the development with the Secretary. The sum of the bond must be calculated at $2.50/m^2 for the total area to be disturbed in each 5 year period, or as otherwise directed by the Secretary.	Letter to Director-General DP&I lodging rehabilitation bond to value of $1,844,272 (11/02/13)	The first Independent Environmental Audit was finalised on 8 October 2012 so the bond should have been submitted by 11 May 2012.	Compliant	
DA195			*Notes:* *• If the rehabilitation is completed to the satisfaction of the Secretary, the Secretary will release the rehabilitation bond.* *• If the rehabilitation is not completed to the satisfaction of the Secretary, the Secretary will call in all or part of the rehabilitation bond, and arrange for the satisfactory completion of the relevant works.*	-		Note	
DA196		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:	Email correspondence between Holcim and DPE regarding rehabilitation bond (dated 9 February 2017) Holcim's letter to DPE regarding rehabilitation bond (dated February 2017)	The second Independent Environmental Audit was finalised on 25 February 2015 so the bond review should have been completed by 25 May 2015. We understand that a bond of $6,664,000 was approved in February 2017, and the DPE notified as per email provided as evidence. This was not within the required timeframe. No further actions are recommended.	Non-compliant	Ensure rehabilitation bond is reviewed & submissions made in a timely manner **Target Completion**: Annual review required Status March 2020: Bond Review yet to be undertaken
DA197		48 (a)	(a) the effects of inflation;	Email correspondence between Holcim and DPE regarding rehabilitation bond (dated 9 February 2017) Holcim's letter to DPE regarding rehabilitation bond Holcim's letter to DPE regarding rehabilitation bond (dated February 2017)	No evidence was sighted that the bond amount considered the effects of inflation. **Recommendation (REC9): bond calculations are filed to allow future review.**	Non-compliant	Develop bond review pro-forma to ensure each review considers all relevant parameters **Target Completion**: June '19 Status March 2020: Bond Review yet to be undertaken
DA198		48 (b)	(b) any changes to the total area of disturbance; and	Email correspondence between Holcim and DPE regarding rehabilitation bond (dated 9 February 2017) Holcim's letter to DPE regarding rehabilitation bond Holcim's letter to DPE regarding rehabilitation bond (dated February 2017)	No evidence was sighted that the bond amount considered the any changes to the total area of disturbance. **Recommendation: refer to (REC9)**.	Non-compliant	Develop bond review pro-forma to ensure each review considers all relevant parameters **Target Completion**: June '19 Status March 2020: Bond Review yet to be undertaken
DA199		48 (c)	(c) the performance of the rehabilitation against the completion criteria of the Rehabilitation and Landscape Management Plan.	Email correspondence between Holcim and DPE regarding rehabilitation bond (dated 9 February 2017) Holcim's letter to DPE regarding rehabilitation bond Holcim's letter to DPE regarding rehabilitation bond (dated February 2017)	No evidence was sighted that the bond amount considered performance criteria. **Recommendation: refer to (REC9)**.	Non-compliant	Develop bond review pro-forma to ensure each review considers all relevant parameters **Target Completion**: June '19 Status March 2020: Bond Review yet to be undertaken
	Retirement of Biodiversity Credits						
			Table 11. Biodiversity Credits to be retired				
DA200		48A	The Applicant must retire the biodiversity credits specified in Table 11 to the satisfaction of the Secretary and OEH. The retirement of credits must be undertaken in accordance with the *Framework for Biodiversity Assessment - NSW Biodiversity Offsets Policy for Major Projects* by:	Holcim's letter to DPE dated 15 Dec 2017 requesting extension to biodiversity credit retirement date (to 30 June 2018) DPE letter to Holcim 31 May 2017 granting an extension to 31 December 2017. Holcim's letter to DPE dated 15 Dec 2017 requesting extension to biodiversity credit retirement date (to 30 June 2018) DPE letter to Holcim 18 December 2017 granting an extension to 30 June 2018. Letter from DPE, 12 July 2018 regarding retirement of biodiversity credits.	Credits have been retired in accordance with this condition.	Compliant*	

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA201		48A (a)	(a) acquiring or retiring credits under the Biobanking Scheme in the TSC Act;	-		Note	
DA202		48A (b)	(b) making payments into an offset fund that has been developed by the NSW Government; or	-		Note	
		48A (c)	(c) providing supplementary measures.	-		Note	
DA203			Credits may be retired progressively as the vegetation to be offset by the credits is cleared. By 31 May 2017, unless otherwise agreed by the Secretary, the Applicant must retire the credits associated with the projected vegetation clearing for the following five years. Credits must continue to be obtained and retired in five-yearly increments prior to clearance of the area of vegetation expected to be cleared in the forthcoming five years. 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).	Letter from DPE, 12 July 2018 regarding retirement of biodiversity credits.	Credits are being progressively retired.	Note	
DA204			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	Letter from DPE, 12 July 2018 regarding retirement of biodiversity credits.	Partial retirement - 1063 credits retired in July 2018 out of 2124 total credits required, with total credit balance of 1061 remaining	Compliant	
DA205			Credit type: Ecosystem credits: HN570 Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion Credits to be retired: 881	Letter from DPE, 12 July 2018 regarding retirement of biodiversity credits.	Complete retirement - 881 total credits retired in July 2018, with 0 credit balance remaining	Compliant	
DA206			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	Letter from DPE, 12 July 2018 regarding retirement of biodiversity credits.	Not yet retired. Not to be disturbed until 2036 (total credit balance 33).	Compliant	
DA207			Credit type: Ecosystem credits: Total: 3038 (2124 + 881 + 33)	Letter from DPE, 12 July 2018 regarding retirement of biodiversity credits.	Partial retirement - 1,944 credits retired July 2018)	Compliant	
DA208			Credit type: Species Credits: Squirrel Glider (Petaurus norfolcensis) Credits to be retired: 1725	Letter from DPE, 12 July 2018 regarding retirement of biodiversity credits.	Completed retirement.	Compliant	
DA209			Credit type: Species Credits: Total: 1725	Letter from DPE, 12 July 2018 regarding retirement of biodiversity credits.	Complete retirement - 1725 total credits retired July 2018, with 0 credit balance remaining	Compliant	
DA210			*Note: The management actions used to generate credits will need to avoid impacting on Aboriginal cultural heritage unless these impacts are identified within an approved Aboriginal Cultural Heritage Management Plan (see condition 35) or an approved Aboriginal Heritage Impact Permit.*	-		Note	

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	VISUAL IMPACT						
	Visual Amenity						
DA211		49	The Applicant must minimise the visual impacts of the development to the satisfaction of the Director-General.	Letter from Director-General DP&I approving management plans (4/4/2012). Site observations.	A visual screen (over 10 m tall) has been erected west of the infrastructure area. Screening bunds were under construction and the outer face had not been planted at the time of the site inspection.	Compliant	
	Lighting Emissions						
DA212		50	The Applicant must take all practicable measures to prevent and/or minimise any off-site lighting impacts from the development.	Site observations. Letter from B. Blakely, Lynwood Quarry's CCC Chair, 30 November 2017	In this audit period, lighting issues were raised by residents during the audit period. Holcim implementing a range of actions to reduce lighting impacts (see http://www.holcim.com.au/about-us/community-link/lynwood/our-community.html). CCC Chair confirmed (letter dated 30 November 2017) that the issue has been successfully resolved "through a combination of input from the CCC and Holcim's actions (consultation, studies, trials, and ultimately, wattage changes, timed on/off switches, height alterations and the construction of a light screen)."	Compliant	
DA213		51	All external lighting associated with the development must comply with *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.*	GHD Lynwood Hard Rock Quarry Detailed Design and Documentation Design Certificate for Process Area External Lighting (31/01/14)		Compliant	
	Advertising						
DA214		52	The Applicant must not erect or display any advertising structure(s) or advertisements on the site without the written approval of the Secretary.	Site observations.	No advertising signage observed.	Compliant	
	WASTE MANAGEMENT						
DA215		53	The Applicant must:				
DA216		53 (a)	(a) monitor the amount of waste generated by the development;	Waste Management and Minimisation Strategy 2017. Sighted examples of waste contractors receipts.	Waste monitoring data was not available. Waste Management and Minimisation Strategy (WMMS) 2017, section 5.0 monitoring, review and continuous improvement	Compliant	
DA217		53 (b)	(b) investigate ways to minimise waste generated by the development;	Waste Management and Minimisation Strategy 2017	Table 1 Waste classification lists minimisation strategies for different types of waste	Compliant	
DA218		53 (c)	(c) implement reasonable and feasible measures to minimise waste generated by the development; and	Waste Management and Minimisation Strategy 2017 Site observations	Observed waste was appropriately segregated during the site inspection.	Compliant	
DA219		53 (d)	(d) report on waste management and minimisation in the Annual Review.	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	AERs have a waste management summary for the reporting period.	Compliant	
			to the satisfaction of the Secretary.				
DA220		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 2017 Site observations	Waste Management and Minimisation Strategy Section 4.0 (waste classification) states that "as per the development consent, waste at Lynwood Quarry needs to be classified as per the *Assessment, Classification and Management of Liquid and Non-liquid Wastes (OEH) guideline.* Table 1 outlines the waste types and classifications managed by Lynwood."	Compliant	
	EMERGENCY AND HAZARDS MANAGEMENT						
	Dangerous Goods						
DA221		55	The Applicant must ensure that the storage, handling, and transport of dangerous goods are conducted in accordance with the relevant *Australian Standards* , particularly AS1940 and AS1596, and the *Dangerous Goods Code.*	Site observations indicated that materials are securely stored in specified locations.	2005 EIS Section 4.2.12 outlines compliance with the Dangerous Goods Code.	Compliant	
	Safety						

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA222		56	The Applicant must secure the development to ensure public safety to the satisfaction of the Director-General.	Site observations		Compliant	
	Bushfire Management						
		57	The Applicant must:				
DA223		57(a)	ensure that the development is suitably equipped to respond to any fires on-site; and	Site observations	The site contains extensive water management infrastructure, including dams that could be used to source fire fighting water.	Compliant	
DA224		57(b)	assist the rural fire service and emergency services as much as possible if there is a fire on-site.	Site interviews.	We understand that a fire in a conveyor during the audit period was extinguished by Holcim and the Rural Fire Service.	Not triggered	
DA225		58	*deleted*				
	QUARRY EXIT STRATEGY						
DA226		59	At least 5 years prior to the cessation of quarry operations, the Applicant must prepare a Quarry Exit Strategy for the development, in consultation with the DPI Water and Council, and to the satisfaction of the Secretary. This plan must:			Not triggered	
DA227		59 (a)	define the objectives and criteria for quarry closure;			Not triggered	
DA228		59 (b)	investigate options for the future use of the site, including any final void/s;			Not triggered	
DA229		59 (c)	describe the measures that would be implemented to minimise or manage the ongoing environmental effects of the development; and			Not triggered	
DA230		59 (d)	describe how the performance of these measures would be monitored over time.			Not triggered	
	SCHEDULE 4 ADDITIONAL PROCEDURES						
	NOTIFICATION OF LANDOWNERS						
		1	As soon as practicable after obtaining monitoring results shown:				
DA231		1 (a)	(a) an exceedance of any relevant criteria in Schedule 3, the Applicant must notify the affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the development is again complying with the relevant criteria; and	Lynwood Quarry Annual Environment Review, September 2016 Site interviews	A noise exceedance is noted in the 2016 AER at assessment location 11. DPE is notified of any exceedance in writing, which is attached as an attachment to the AERs. This location appears to be representative of three residences (11, 14 and 14). As described in the AER Attachment 1, actions were taken to ensure that the situation was rectified. We understand that Bruce Dugan was notified about an exceedance in noise, which did not effect their property. However, evidence was not provided that landowners at all potentially affected residences were notified. Recommendation (REC10): the procedure for responding to/notifying exceedances to all landowners that are potentially impacted by any noise exceedance is reviewed.	Non-compliant	Revise procedure for responding to / notification of exceedances to ensure all potentially impacted are notified **Target Completion**: August '19 Status March 2020: Review of Procedure yet to be undertaken. No exceedances experienced during 2019.
DA232		1 (b)	(b) an exceedance of any relevant air quality criteria in Schedule 3, the Applicant must send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and current tenants of the land (including the tenants of land which is not privately owned).	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	Only one tenant resides on Holcim land, close to the Johnnifields Quarry, east of Lynwood Quarry. Health-based air quality criteria have not been exceeded at the high volume air sampler on the eastern side of the quarry (HVAS 2).	Not triggered	
	INDEPENDENT REVIEW						
DA233		2	If an owner of privately-owned land considers the development to be exceeding the relevant criteria in Schedule 3, then he/she may ask the Secretary in writing for an independent review of the impacts of the development on his/her land.	-		Not triggered	
DA234		3	If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision the Applicant must:	-		Not triggered	

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA235		3 (a)	(a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to: • consult with the landowner to determine his/her concerns; • conduct monitoring to determine whether the development is complying with the relevant criteria in Schedule 3; and • if the development is not complying with these criteria then identify measures that could be implemented to ensure compliance with the relevant criteria; and	-		Not triggered	
DA236		3 (b)	(b) give the Secretary and landowner a copy of the independent review.	-		Not triggered	
	SCHEDULE 5 ENVIRONMENTAL						
	ENVIRONMENTAL MANAGEMENT STRATEGY (Incorporates OEH GTA)						
DA237		1	If the Secretary requires, the Applicant must prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:	Environmental Management Strategy, Rev 3, January 2013		Compliant	
DA238		1 (a)	(a) be submitted to the Secretary for approval within 6 months of the Secretary requiring preparation of the strategy by notice to the Applicant;	Letter from DP&I , 19 April 2007.	The original strategy was approved, and the EMS has subsequently been updated.	Compliant	
DA239		1 (b)	(b) provide the strategic framework for the environmental management of the development;	Environmental Management Strategy, Rev 3, January 2013	EMS Section 2 (Environmental Management Framework)	Compliant	
DA240		1 (c)	(c) identify the statutory approvals that apply to the development;	Environmental Management Strategy, Rev 3, January 2013	EMS Section 3.2 (Statutory Requirements)	Compliant	
DA241		1 (d)	(d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;	Environmental Management Strategy, Rev 3, January 2013	EMS Table 4.1 (General Environmental Responsibilities at Lynwood Quarry) lists the specifications for requirements of this condition.	Compliant	
DA242		1 (e)	(e) describe the procedures that would be implemented to:				
DA243			• keep the local community and relevant agencies informed about the operation and environmental performance of the development;	Environmental Management Strategy, Rev 3, January 2013	EMS Section 4.3.2 (External Communication)	Compliant	
DA244			• receive, handle, respond to, and record complaints;	Environmental Management Strategy, Rev 3, January 2013	EMS Section 4.4 (Complaints Management and Dispute Resolution)	Compliant	
DA245			• resolve any disputes that may arise during the course of the development;	Environmental Management Strategy, Rev 3, January 2013	EMS Section 4.4.2 (Dispute Resolution)	Compliant	
DA246			• respond to any non-compliance; and	Environmental Management Strategy, Rev 3, January 2013	EMS Section 5 (Environmental Monitoring, Corrective Action and Audits)	Compliant	
DA247			• respond to emergencies; and	Environmental Management Strategy, Rev 3, January 2013	EMS Section 4.8 (Emergency Preparedness and Response)	Compliant	
DA248		1 (f)	(f) include: • copies of any strategies, plans and programs approved under the conditions of this development consent; and • a clear plan depicting all the monitoring required to be carried out under the conditions of this consent.	Environmental Management Strategy, Rev 3, January 2013	The strategies, plans and programs approved under the Development Consent are described. However, they are not attached. This is appropriate as the plans need to be reviewed and updated periodically. It is better that there is one version of each plan in the system rather than replicating the plan as an appendix to the EMS so that it is clear which is the most recent version of each plan. Similarly, monitoring requirements should be provided in only one place - the plan to which they are relevant.	Compliant	
DA249			The Applicant must implement any Environmental Management Strategy as approved from time to time by the Secretary.	Site observations.		Compliant	
	Evidence of Consultation						

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA250		1A	Where consultation with any public authority is required by the conditions of this consent, the Applicant must:				
DA251		1A (a)	(a) consult with the relevant public authority prior to submitting the required document to the Secretary for approval;	Numerous letters/emails (2016/2017) involving consultation with government agencies regarding conditions relevant to their jurisdiction, plans/programs/strategies relevant to their scope.	This condition was introduced in MOD5 (May 2017). Recently prepared plans describe the consultation undertaken during their preparation.	Compliant	
DA252		1A (b)	(b) submit evidence of this consultation as part of the relevant document;	Numerous letters/emails (2016/2017) involving consultation with government agencies regarding conditions relevant to their jurisdiction, plans/programs/strategies relevant to their scope. Water Management Plan, September 2016 Rehabilitation and Landscape Management Plan, September 2016	The Water Management Plan (2016) and the Rehabilitation and Landscape Management Plan, September 2016 describe consultation but does not provide evidence. Evidence has been provided that agencies were consulted during the preparation of more recent plans.	Compliant	
DA253		1A (c)	(c) describe how matters raised by the authority have been addressed and any matters not resolved; and	Numerous letters/emails (2016/2017) involving consultation with government agencies regarding conditions relevant to their jurisdiction, plans/programs/strategies relevant to their scope.		Compliant	
DA254		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.	Numerous letters/emails (2016/2017) involving consultation with government agencies regarding conditions relevant to their jurisdiction, plans/programs/strategies relevant to their scope.		Compliant	
	MANAGEMENT PLAN REQUIREMENTS						
		2	The Applicant must ensure that the Management Plans required under this consent are prepared in accordance with any relevant guidelines, and include:				
DA255		2 (a)	(a) detailed baseline data;	Riparian Area Management Plans (June 2011); Noise Management Plan (September 2016); Blast Management Plan (November 2016); Air Quality Management Plan (October 2016); Draft Water Management Plan (September 2016); Aboriginal Heritage Management Plan, Caring for Country Final (July 2018) Water Management Plan (2018) Waste Management and Minimisation Strategy (2017) Pollution Incident Response Management Plan (September 2018)	This condition was introduced in MOD4 (May 2016) so does not apply to plans prepared prior to this time. Detailed baseline data is not provided in the draft Water Management Plan (September 2016). **Recommendation (REC11): detailed baseline data is provided in management plans when they are updated.**	Compliant	
DA256		2 (b)	(b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; and • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	See list of management plans above.	This condition was introduced in MOD4 (May 2016) so does not apply to plans prepared prior to this time.	Compliant	
DA257		2 (c)	(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	See list of management plans above.	This condition was introduced in MOD4 (May 2016) so does not apply to plans prepared prior to this time.	Compliant	
DA258		2 (d)	(d) a program to monitor and report on the: • impacts and environmental performance of the development; and • effectiveness of any management measures (see (c) above)	See list of management plans above.	This condition was introduced in MOD4 (May 2016) so does not apply to plans prepared prior to this time.	Compliant	

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DA259		2 (e)	(e) a contingency plan to manage any unpredicted impacts and their consequences;	See list of management plans above.	This condition was introduced in MOD4 (May 2016) so does not apply to plans prepared prior to this time. **Recommendation (REC12): contingency plans to manage any unpredicted impacts and their consequences are provided in the management plans prepared before May 2016 when they are updated.**	Compliant	
DA260		2 (f)	(f) a program to investigate and implement ways to improve the environmental performance of the development over time;	See list of management plans above.	This condition was introduced in MOD4 (May 2016) so does not apply to plans prepared prior to this time.	Compliant	
DA261		2 (g)	(g) a protocol for managing and reporting any: • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and	See list of management plans above. Holcim's INX system	This condition was introduced in MOD4 (May 2016) so does not apply to plans prepared prior to this time. Reporting protocols for incidents, complaints, non-compliances and exceedances are not described in the draft Rehabilitation & Landscape Management Plan (September 2016). However, where these plans have been approved by the Secretary, it is assumed that this requirement has been waived as per the note below. **Recommendation (REC13): reporting protocols for incidents, complaints, non-compliances and exceedances are provided in the management plans prepared before May 2016 when they are updated.**	Compliant	
DA262		2 (h)	(h) a protocol for periodic review of the plan.	See list of management plans above.	This condition was introduced in MOD4 (May 2016) so does not apply to plans prepared prior to this time. A protocol for parodic review is not described in the Blast Management Plan (November 2016). However, where these plans have been approved by the Secretary, it is assumed that this requirement has been waived as per the note below. **Recommendation (REC14): a protocol for periodic review is described in the Blast Management Plan (November 2016).** **Recommendation (REC15): a protocol for parodic review is provided in the management plans prepared before May 2016 when they are updated.**	Compliant	
DA263			*Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.*			Note	
DA264		3	Prior to approval of management plans required under Schedule 3, all existing management plans, monitoring programs, strategies, programs, protocols, etc approved as at the date of approval of Modification 4 must continue to have full force and effect, and may be revised under the requirements of condition 5 below as if subject to the conditions of this consent that applied prior to the approval of Modification 4, or otherwise with the approval of the Secretary.	-	This audit has considered plans prepared prior to the approval of MOD 4 as appropriate.	Note	
	UPDATING & STAGING SUBMISSION OF STRATEGIES, PLANS OR PROGRAMS						
DA265		4	To ensure the strategies, plans or programs under this consent are updated on a regular basis, and that they incorporate any appropriate mitigation measures to improve the environmental performance of the development, the Applicant may at any time submit revised strategies, plans or programs to the Secretary for approval. With the agreement of the Secretary, the Applicant may also submit any strategy, plan or program required by this consent on a staged basis.	-		Note	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
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DA266			With the agreement of the Secretary, the Applicant may revise any strategy, plan or program approved under this consent without consulting with all the parties nominated under the applicable conditions of consent.	-		Note	
DA267			Notes: • *While any strategy, plan or program may be submitted on a progressive basis, the Applicant will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times.* • *If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.*	-		Note	
	REVISION OF STRATEGIES, PLANS & PROGRAMS						
DA268		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.	Notification of noise exceedances and missing blast information, August 2016, appended to 2016 AER.	This condition requires that all strategies, plans, and programs are reviewed annually and more frequently if there is an incident, audit, or modification during the year. While a number of plans were reviewed within the required timeframe, some plans remain not updated. **Recommendation (REC16): all strategies, plans, and programs should be reviewed as soon as possible.** **Recommendation (REC17): a register is established that shows when each strategy, plan, and program was reviewed in accordance with with this condition; stating whether updates were required.**	Non-compliant	Set up document review register for all management plans Conduct review of all Management Plans within 3 months of this audit being completed. **Target Completion**: June '19 Status March 2020: Review conducted & submitted 01.07.2019. Management Plans being revised as detailed in comment above.
DA269			*Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.*	-		Note	
	ADAPTIVE MANAGEMENT						
DA270		6	The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedule 3. Any exceedance of these criteria and/or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.	-		Note	
			Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must, at the earliest opportunity:				
DA271		6 (a)	take all reasonable and feasible measures to ensure that the exceedance ceases and does not recur;	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	Sighted AERs for the audit period, each of which shows actions taken to minimise/control/report on exceedances.	Compliant	
DA272		6 (b)	consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	For example, information regarding exceedance of noise criteria is provided in an appendix to 2016 AER.	Compliant	
DA273		6 (c)	implement remediation measures as directed by the Secretary,	-	DPE did not note any occurrences during consultation as part of this audit.	Not triggered	
			to the satisfaction of the Secretary.				
	COMMUNITY CONSULTATIVE COMMITTEE						

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA274		7	The Applicant must operate a Community Consultative Committee (CCC) for the development, to the satisfaction of the Secretary. This CCC must be operated in general accordance with the Department's Community Consultative Committee Guidelines for State Significant Projects, November 2016 (or its latest version).	Letter from Brendan Blakeley, Lynwood Quarry's CCC Chair, 30 November 2017.	Brendan Blakeley, Lynwood Quarry's CCC Chair responded to EMM's audit consultation letter and noted "The CCC runs in accordance with the original conditions of approval. However, we have progressively aligned our practices with the DPE's recently revised CCC Guidelines. This has included a summary report to the DPE, as well as members signing forms to recommitment themselves to the CCC." Information about the Community Consultative Committee available on Holcim website http://www.holcim.com.au/about-us/community-link/lynwood/our-community.html	Compliant	
DA275			*Notes:* *• The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Applicant complies with this consent.* *• In accordance with the guideline, the committee should be comprised of an independent chair and appropriate representation from the Applicant, Council, and the local community.*	-		Note	
	REPORTING						
	INCIDENT REPORTING						
DA276		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.	Pollution Incident Response Management Plan Lynwood Quarry (September 2018)* (PIRMP) Annual Environmental Review 2016 INX Incident register.	Non-compliances generally appear to be reported to agencies appropriately. The 1,500-2,000 L diesel spill that occurred on 6 December 2016 was well contained within site, with no offsite impact, and was immediately contained and the diesel removed. Page 20 of the PIRMP shows all the agencies that need to be notified in the event of an incident. It notes that emergency services, EPA, Appropriate Regulatory Authority, among other authorities, will be notified. However, there is no specific mention of the 'Secretary'. <<Update - fully contained well within site and no impacts>> **Recommendation (REC18): PIRMP should be amended to include notification of the Secretary following an emergency incident, as per the requirements of this condition.**	Compliant	

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	REGULAR REPORTING						
DA277	9	9	The Applicant must provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.	Holcim website Lynwood Quarry webpage, Planning - Approvals-Reporting page (last visited 18 October 2018) https://www.holcim.com.au/about-us/community-link/lynwood/planning-approvals-reporting	Annual reports and fortnightly monitoring reports are provided on the Holcim website. Holcim website Lynwood Quarry webpage provides information about Lynwood Quarry, heritage, community, community investment fund, CIF projects funded, information updates and planning, approvals and reporting documentation. However, not everything is up to date.	Compliant	
	ANNUAL REVIEW						
DA278		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:	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	The timing of the Annual Environment Review reports has been changed in consultation with DPE to match the Financial Year.	Compliant	
DA279		10 (a)	(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;	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	Each of the AERs includes a section that summarises development within the past year, and activities proposed for the next reporting period.	Compliant	
DA280		10 (b)	(b) include a comprehensive review of the monitoring results and complaints records of the development over the previous financial year, which includes a comparison of these results against: • the relevant statutory requirements, limits or performance measures/criteria; • 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;	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.		Compliant	
DA281		10 (c)	(c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.		Compliant	
DA282		10 (d)	(d) identify any trends in the monitoring data over the life of the development;	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	Historical trend data generally presented for air quality, surface water quality and groundwater quality presented n 2015 AER. Historical trend data generally presented for air quality in 2016 AER. No historical trend data presented in 2017 AER. However, this report only considered 6 months of data so annual trends were not provided.	Compliant	
DA283		10 (e)	(e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies;	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	For example, notification of noise exceedances and missing blast information appended to 2016 AER.	Compliant	

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DA284		10 (f)	(f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.		Compliant	
DA285		10 (g)	(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;	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.		Compliant	
DA286		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	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Letter from DPE, 12 July 2018 regarding retirement of biodiversity credits.	Table 13 'Expected offsets per stage of granite pit development' from the Lynwood Quarry Annual Environmental Review 2017 report shows that the number of credits required per stage of development have been calculated for the granite pit. Biodiversity credits are being progressively retired. **Recommendation (REC19): future annual environmental reviews should include information in the additional BioBanking (or equivalent) credits that will need to be purchased or note that no additional credits are required.**	Compliant	
DA287		10 (i)	(i) report on the number of BioBanking (or equivalent) credits that have been purchased to allow ongoing clearing and completion of stages.	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017.	Table 13 'Expected offsets per stage of granite pit development' from the Lynwood Quarry Annual Environmental Review 2017 report shows that the number of credits required per stage of development have been calculated for the granite pit.	Compliant	
DA288			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.	Documentation provided during the audit period	While the AERs are available on the Holcim website, there is no evidence that that the AERs in the reporting period were submitted directly to Council. Recommendation (REC20): all Annual Environmental Reviews are submitted to the Council.	Non-compliant	Set up distribution list for AER to all interested parties, including Council. **Target Completion**: April '19 Status March 2020: Distribution list still to be established. 2018 AER submitted to Council.
	INDEPENDENT ENVIRONMENTAL AUDIT						
DA289		11	By 30 September 2017, and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:	Holcim Purchase order number 4520427805, 30 May 2017.	Audit commissioned in May 2017. Site audit inspection arranged for 9 January 2018. See Audit Report Section 2.3.	Compliant	
DA290		11 (a)	(a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;	Holcim letter to DPE, dated 30 May 2017.	Dr Philip Towler, the lead auditor, was approved by DPE to undertake the audit.	Compliant	
DA291		11 (b)	(b) include consultation with the relevant agencies and the CCC;	Responses received from: DPE, DPI Fisheries, DRG, Goulburn Mulwaree Council, Heritage Council NSW, OEH, Water NSW and Chair of the CCC.	See Appendix D of Lynwood Quarry Independent Environmental Audit Report (2018) for example of consultation letter provided to agencies. Refer to Table 4.4 for a summary of agency comments received during the consultation process, and audit responses.	Compliant	
DA292		11 (c)	(c) assess the environmental performance of the development and whether it is complying with the relevant requirements in this consent and any relevant EPL and/or Water Licence (including any assessment, plan or program required under these approvals);	-	All conditions of this consent, statement of commitments (SoC), the EPL and management plans have been audited.	Compliant	
DA293		11 (d)	(d) review the adequacy of any approved strategy, plan or program required under the these approvals;	Various.	The adequacy of approved strategies, plans and programs required under the these approvals has been reviewed.	Compliant	

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DA294		11 (e)	(e) recommend measures or actions to improve the environmental performance of the development, and/or any assessment, plan or program required under these approvals; and	-	See audit recommendations section.	Compliant	
DA295		11 (f)	(f) be conducted and reported to the satisfaction of the Secretary.	-	This will be determined by DPE.	Note	
DA296			*Note: This audit team must be led by a suitably qualified auditor and include experts in any fields specified by the Secretary.*	-		Note	
DA297		12	Within 12 weeks of commencing this audit, or as otherwise agreed by the Secretary, the Applicant must submit a copy of the audit report to the Secretary, Council, EPA and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report.	-	This audit was finalised in March 2019. See discussion in main Lynwood Quarry Independent Environmental Audit Report (2019) Section 1.7. **No further actions are recommended.**	Non-compliant	Implement corporate system to track progress of external audits & ensure correct processes are being followed **Target Completion**: May '19 Status March 2020: System yet to be established
	ACCESS TO INFORMATION						
		13	By 30 November 2016, unless otherwise agreed by the Secretary, until the completion of all works, including rehabilitation and remediation, the Applicant must:				
DA298		13 (a)	a) make the following information publicly available on its website:				
DA299			• the documents listed in condition 2(a) of Schedule 2;	http://www.holcim.com.au/about-us/community-link/lynwood/planning-approvals-reporting.html (29/01/18)		Compliant	
DA300			• current statutory approvals for the development;	http://www.holcim.com.au/about-us/community-link/lynwood/planning-approvals-reporting.html (29/01/18)		Compliant	
DA301			• approved strategies, plans or programs;	http://www.holcim.com.au/about-us/community-link/lynwood/planning-approvals-reporting.html (29/01/18)		Compliant	
DA302			• a summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this consent;	http://www.holcim.com.au/about-us/community-link/lynwood/planning-approvals-reporting.html (29/01/18)	AERs available on the website. Fortnightly monitoring reports are available on the website.	Compliant	
DA303			• a complaints register, which is to be updated on a quarterly basis;	https://www.holcim.com.au/about-us/community-link/lynwood/our-community/complaints-register (29/01/18)	Quarterly complaints registers are listed on the website. for Quarter 3 2016 to Quarter 4 2017. However, with the exception of Quarter 4 2017, the listings are not linked to any files. For example there was a dust complaint on 21 September 2017 that is not provided. Complaints are summarised in AERs which are available on the Holcim website. This is updated annually. Recommendation (REC21): the quarterly complaints register on the Holcim website is updated so that all registers are available.	Non-compliant	Develop & implement system for updating complaints register & uploading information to web site **Target Completion**: June '19 Status March 2020: System operating (website updated by Corporate staff)
DA304			• the Annual Reviews (over the last 5 years);	http://www.holcim.com.au/about-us/community-link/lynwood/planning-approvals-reporting.html (29/01/18)	AERs from 2010/2011 to 2017 are available.	Compliant	
DA305			• any independent environmental audit, and the Applicant's response to the recommendations in any audit;	http://www.holcim.com.au/about-us/community-link/lynwood/planning-approvals-reporting.html (29/01/18)		Compliant	
DA306			• any other matter required by the Secretary; and			Note	
DA307			• keep this information up-to-date,	http://www.holcim.com.au/about-us/community-link/lynwood/planning-approvals-reporting.html (29/01/18)	Some of the management plans and monitoring programs need to be updated. **Recommendation (REC22): the currency of all management plans and programs on the website is reviewed.**	Non-compliant	Develop & implement corporate system for checking content of web pages is current **Target Completion**: June '19 Status March 2020: Review of document currency to occur when revised Management Plans are uploaded
			to the satisfaction of the Secretary.			Note	
DA308	**APPENDIX 1: SCHEDULE OF LAND**		Includes a list of all Lot, DP numbers as well as Owner details			Note	

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DA309	**APPENDIX 2: DEVELOPMENT LAYOUT [Map figure]**			Site observations. Review of DigitalGlobe satellite image against Appendix 2 (Development Layout).	Development layout is generally in accordance with DA.	Compliant	
DA310	**APPENDIX 3. NOISE RECEIVER LOCATIONS [Map figure]**					Note	
DA311	**APPENDIX 4. LOCATION OF SEDIMENT DAMS [Map figure]**			Site observations. Review of DigitalGlobe satellite image against Appendix 4 (Location of Sediment Dams).	Sedimentation dams have been contracted in accordance with the plan. Some sediment dams have not been installed. However, these are associated with areas that have not yet been materially disturbed.	Compliant	
DA312	**APPENDIX 5. CONSTRUCTION TRAFFIC ROUTES [Map figure]**			Site observations.	While there was construction during the audit period, it was not occurring at the time of the audit. The South Marulan Interchange was operating for the entire audit period and there is no reason that construction traffic would use routes other than the Hume Highway and the site access road.	Compliant	
DA313	**APPENDIX 6. CULTURAL HERITAGE MANAGEMENT ZONE [Map figure]**			Site observations. Review of DigitalGlobe satellite image against Appendix 6 (Location of Sediment Dams).	There appears to be no quarry-related disturbance within the Cultural Heritage Management Zones. Fences and signs were observed while on site.	Compliant	
	APPENDIX 7: DETAILED HERITAGE CONDITIONS						
			These conditions apply to the portion of the State Heritage Register Area within the site that is impacted by the development.				
DA314		1	The NSW Heritage Office must be informed in writing of the start of the archaeological investigation at least five (5) days prior to the commencement of, and within five (5) days of the completion of on-site archaeological work.	LTR_Old Marulan_Sign off_Dec 2010.		Compliant	
DA315		2	The Heritage Council and staff of the NSW Heritage Office authorised under section 148(1) of the 'Heritage Act, 1977' reserve the right to inspect the site and records at all times, as well as access any relics recovered from the site.	Site interviews (2012).	Inspection was conducted on 22/12/07*	Compliant	
DA316		3	The Applicant must ensure that all personnel involved in excavation works attend a comprehensive briefing on the requirements of the 'Heritage Act, 1977' in relation to archaeological relics and the proposed archaeological programme. The briefing is to be presented by the Excavation Director nominated in the section 60 application and is to be undertaken prior to the commencement of on-site works. A copy of this approval and conditions of consent should be made available to all archaeological on-site staff.	Interview with the Excavation Director, T. Adams (Umwelt) (6/6/12).		Compliant	
DA317		4	The Applicant must ensure that if substantial intact archaeological deposits and/or State significant relics not identified in *Environmental Impact Statement, Readymix Holding Pty Ltd Proposed Lynwood Quarry, Marulan* , prepared by Umwelt Environmental Consultants, are discovered, work must cease in the affected area(s) and the Heritage Council of NSW must be notified. Additional assessment and approval may be required prior to works continuing in the affected area(s) based on the nature of the discovery.	-		Not triggered	

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DA318		5	The Heritage Council of NSW must approve any substantial deviations from the approved research design outlined in E*nvironmental Impact Statement, Readymix Holding Pty Ltd Proposed Lynwood Quarry, Marulan* , prepared by Umwelt Environmental Consultants, including extent and techniques of excavations, as an application for the variation of an approval under section 65A or a new application under section 60 of the 'Heritage Act, 1977'.	Old Marulan Archaeological Letter to DECC, S65_2009_65A_11 (27/10/10).	The S65A variation 2007/S65/11 which refers to the approval of the changed research design has not been sighted but subsequent DECC letters note this variation as occurring.	Compliant	
DA319		6	The Applicant must ensure that the nominated Excavation Director is present at the site supervising all archaeological fieldwork activity likely to expose significant relics 100% of the duration of the archaeological activity. Should this not be possible, then the Applicant must forward for the approval of the Heritage Council or Director of the NSW Heritage Office the details of a Site Director in charge for this period.	Sighted S65_2009_65A_13, s65 assist director and notification.		Compliant	
DA320		7	At all times during periods of archaeological excavation the Applicant must comply with any directions of the nominated Excavation Director in relation to works likely to impact on this resource. Where major issues arise the Excavation Director must consult with the Director of the heritage Office prior to issuing directions.	Holcim letter to OEH dated 15 June 2017.	Letter sighted shows that all archaeological salvage works are to be completed with involvement from archaeologist (ie monitoring is to be undertaken by archaeologist).	Compliant	
DA321		8	Given the exceptional significance of the archaeological remains of the Old Marulan Township, the Applicant must ensure that the nominated Excavation Director, and archaeological excavation team, are given priority when allocating resources to allow thorough archaeological excavation and full and detailed recording to be undertaken to the satisfaction of the Heritage Council. Where necessary, work schedules shall be adjusted to accommodate the approved archaeological works.	Heritage Branch sign off (16/12/2010).		Compliant	
DA322		9	Throughout the archaeological excavation works and post-excavation analysis, the Applicant must ensure that:				
DA323		9(a)	Appropriate signage to explain the history of the site and the archaeological excavation works is placed at the site during the work,	Site observations.	There are no signs. However, there are no appropriate publicly accessible locations to place these signs so this is considered appropriate.	Compliant	
DA324		9(b)	A local public information program is implemented including press releases to ensure the public is informed about the project and its outcomes,	http://www.holcim.com.au/about-us/community-link/lynwood/our-community.html (29/01/18)		Compliant	
DA325		9(c)	Community participation in the archaeological works on the site is allowed for through the inclusion of volunteers on the archaeological team under the supervision of the Excavation Director,	Interview with T. Adams (6/6/12)	Community is invited to submit enquiries online http://www.holcim.com.au/about-us/community-link/lynwood/our-heritage.html (29/01/18)	Compliant	
DA326		9(d)	A website addressing the archaeological works on the site must be created. This website must feature a history of the site, archaeological methodology, updated information on the archaeological works, photographs of the site and significant archaeological remains uncovered, links to the archaeological reports and links to other relevant sites. Public feedback must also be allowed for in this section of the website. Updated information on the Open Day to be held during archaeological works at Old Marulan Township and an on-line booking service must also be included,	http://www.holcim.com.au/about-us/community-link/lynwood/our-heritage.html (29/01/18)		Compliant	

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DA327		9(e)	The progress on the archaeological works on site is systematically video recorded,	Interviews with Holcim personnel indicate that the works were videoed. However, all attempts to obtain copies of the footage have been unsuccessful and current personnel believe that it is unlikely this material will ever be found.	**Recommendation (REC23): video recordings of the archaeological works are located if possible.**	Non-compliant	While the works were videoed, all attempts to obtain copies of the footage have been unsucessful. Unlikley this material will ever be found. Agree resolution to situatuion with OEH. **Target Completion**: September '19 Status March 2020: No action taken
DA328		9(f)	The services of a conservator must be utilised for conservation of significant artefacts,	Sighted Old Marulan Archaeological Letter to DECC (27/10/10)		Compliant	
DA329		9(g)	The Heritage Office is notified weekly, in writing, of the progress of work during excavation and monthly during post excavation analysis,	Sighted combined weekly reports 1-4	No return correspondence from Heritage Branch*	Compliant	
DA330		9(h)	All affected areas of the site are signed off by the Heritage Office prior to commencement of bulk excavation in those identified locations, and	Heritage Branch sign off on 16/12/2010		Compliant	
DA331		9(i)	At the completion of the archaeological works on site the results of the archaeological programme are interpreted as part of an interpretation programme for the Old Marulan Township precinct.	Umwelt letter to OEH, dated 29 June 2011 regarding Old Marulan Township - Road Reserve Works		Compliant	
DA332		10	It is essential that the Applicant and nominated Excavation Director allow for and present opportunities for interpretation, public education and public access to the results of the archaeological investigation during and upon completion of the works programme. A number of Public Open Days (to be determined based on public demand) must be conducted at the site. These Public Open Days must be scheduled to take place during a weekend to facilitate public attendance and must be advertised at least one week ahead to facilitate greater public awareness of the opportunity. Visits need to be prebooked to better organise the groups and on-site activities. The Applicant must ensure that local historical societies and other relevant cultural organisations are formally notified and invited to the Public Open Days.	Sighted letter from Heritage Branch_Well MRNH8_InterpPlan_20090305 - stating Heritage Branch satisfied with public interpretation Information on exhibitions of artists in residence. Site interviews.	An open day was held in 2017 and a number of community tours have been held.	Compliant	
DA333		11	An interpretation programme for the entire Old Marulan Township heritage precinct incorporating the results of the archaeological excavation must be implemented. This interpretation should help the public understand the history and significance of the site. Final design details of the interpretation plan, including information on the display and housing of artefacts and other relevant materials, and interpretation of the structural remains, is to be submitted to the Director of the Heritage Office for written approval before implementation of the interpretation.	Sighted letter from Heritage Branch_Well MRNH8_InterpPlan_20090305 - stating Heritage Branch satisfied with public interpretation		Compliant	
DA334		12	The Applicant must ensure that an archaeological publication for the general public of Old Marulan Township incorporating the results of the archaeological programme at the site is prepared. Final design details of this publication are to be submitted to the Director of the NSW Heritage Office for approval within six months of the completion of the excavation programme. The publication is to be completed within one (1) year of the conclusion of the project unless an extension of time is approved by the Heritage Council of NSW.	Sighted photographs of the Old Marulan 2007 Archaeological Investigations - Final Report - Volume 2 Umwelt letter to Holcim advising that the final archaeological report for the Old Marulan 2007 archaeological excavations has been completed (and enclosing a copy with the letter) dated 20 May 2015	Section 6.0 of the final report is about 'Results of the Archaeological Survey and Excavation'. Section 5.0 is about 'Research Design'. The reporting requirements were not completed within the specified timeframes. The report has now been placed in the Holcim website. **No further actions are recommended.**	Non-compliant	Delay was a result of initial consultant undertaking this work ceasing to run the business. Alternative consultant engaged to complete report resulted in the deadline being missed No further action required

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA335		13	The Applicant must ensure that the nominated Excavation Director takes adequate steps to record in detail relics, structures and features discovered on the site during the archaeological works in accordance with current best practice. This work must be undertaken in accordance with the NSW Heritage Office guidelines, 'How to Prepare Archival Records of Heritage Items' (1998) and 'Guidelines for Photographic Recording of Heritage Items' (2004). One (1) copy of the photographic and archival recording shall be submitted to the Heritage Council of NSW. A further copy shall be lodged with the local library and/or another appropriate local repository in the area in which the site is located.	Holcim letter to OEH dated 15 June 2017	Letter provided evidence and reporting requirements of archaeological salvage.	Compliant	
DA336		14	The Applicant is responsible for the safe-keeping of all relics recovered from the site.	Heritage Branch letter detailing Artefact management policy is appropriate (7/9/09)		Compliant	
DA337		15	The Applicant must ensure that the site under archaeological investigation is made secure and that the unexcavated artefacts, structures and features are not subject to deterioration, damage or destruction during and after fieldwork.	Site observations (2012)		Compliant	
DA338		16	The Applicant must ensure that the nominated Excavation Director cleans, stabilises, labels, analyses, catalogues and stores any artefacts recovered from the site in a way that allows them to be retrieved according to both type and provenance.	Holcim letter to OEH dated 15 June 2017	Letter shows that care and diligence was taken during archaeological salvage undertaken on site.	Compliant	
DA339		17	The Applicant must ensure that a summary of the results of the field work, up to 500 words in length, is submitted to the Heritage Council of NSW for approval within one (1) month of completion of archaeological field work. This information is required in accordance with section 146(b) of the 'Heritage Act, 1977'.	End of fieldwork 500 word report - final (2) (D. Gojak, Banksia Heritage + Archaeology, 15/3/08)		Compliant	
DA340		18	The Applicant must ensure that a final excavation report is prepared by the nominated Excavation Director, to publication standard, within one (1) year of the completion of the field based archaeological activity unless an extension of time or other variation is approved by the Heritage Council of NSW.	Sighted relavant pages of the Old Marulan 2007 Archaeological Investigations - Final Report - Volume 2 Umwelt letter to Holcim advising that the final archaeological report for the Old Marulan 2007 archaeological excavations has been completed (and enclosing a copy with the letter) dated 20 May 2015	The report was not submitted within the specified timefarme. **No further actions are recommended.**	Non-compliant	Delay was a result of initial consultant undertaking this work ceasing to run the business. Alternative consultant engaged to complete report resulted in the deadline being missed No further action required
DA341		19	The Applicant must ensure that one (1) electronic copy of the final excavation report is submitted on CD to the Heritage Council of NSW together with two (2) printed copies of the final excavation report. These reports are required in accordance with section 146(b) of the 'Heritage Act, 1977'. The Applicant must also ensure that further copies are lodged with the local library and/or another appropriate local repository in the area in which the site is located.	Umwelt letter to Heritage Division, OEH, providing the final excavation report and electronic data, dated 20 May 2015.		Compliant	
DA342		20	The Applicant must ensure that the information presented in a final excavation report includes the following:				
DA343		20(a)	(a) An executive summary,	Sighted relevant pages of the Old Marulan 2007 Archaeological Investigations - Final Report - Volume 2		Compliant	
DA344		20(b)	(b) Due credit to the client paying for the excavation on the title page,	Sighted relevant pages of the Old Marulan 2007 Archaeological Investigations - Final Report - Volume 2		Compliant	
DA345		20(c)	(c) An accurate site location and site plan,	Sighted relevant pages of the Old Marulan 2007 Archaeological Investigations - Final Report - Volume 2	Attachment 1 includes air photo analysis	Compliant	
DA346		20(d)	(d) Historical research, references, and bibliography,	Sighted relevant pages of the Old Marulan 2007 Archaeological Investigations - Final Report - Volume 2		Compliant	

DA 128-5-2005 (including Modification 1 (21/12/05) , Modification 2 (22/3/11) Modification 3 (17/8/11), Modification 4 (5/2016) and Modification 5 (5/2017)							
Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
DA347		20(e)	(e) Detailed information on the excavation including the aim, the context for the excavation, procedures, treatment of artefacts (cleaning, conserving, sorting, cataloguing, labelling, scale photographs and/or drawings, location of repository) and analysis of the information retrieved,	Sighted relevant pages of the Old Marulan 2007 Archaeological Investigations - Final Report - Volume 2		Compliant	
DA348		20(f)	(f) Detailed response to research questions,	Sighted relevant pages of the Old Marulan 2007 Archaeological Investigations - Final Report - Volume 2		Compliant	
DA349		20(g)	(g) Nominated repository for the items,	Sighted relevant pages of the Old Marulan 2007 Archaeological Investigations - Final Report - Volume 2		Compliant	
DA350		20(h)	(h) Conclusions from the archaeological programme. This information must include a reassessment of the site's heritage significance, statement(s) on how archaeological investigations at this site have contributed to the community's understanding of the site and recommendations for the future management of the site, and	Sighted relevant pages of the Old Marulan 2007 Archaeological Investigations - Final Report - Volume 2	Section 6.0 of the final report is about 'Results of the Archaeological Survey and Excavation'. Section 5.0 is about 'Research Design'.	Compliant	
DA351		20(i)	(i) Details of how this information about this excavation has been publicly disseminated.	https://www.holcim.com.au/about-us/community-link/lynwood/planning-approvals-reporting (	**Recommendation (REC24): The Old Marulan Township interpretation report is placed on the Holcim website.**	Non-compliant	Check feasibility of uploading the report to the Holcim website (size is a potential issue). Upload if feasible. **Target Completion**: August '19 Status March 2020: Yet to be actioned. Final investigation report is on the website. Need to check if this included the Interpretation Report
DA352	**APPENDIX 8: CONCEPTUAL REHABILITATION PLAN [Map figure]**					Not triggered	
DA353	**APPENDIX 9. HABITAT MANAGEMENT AREAS [Map figure]**			Site observations. Review of DigitalGlobe satellite image against Appendix 2 (Development Layout).		Compliant	

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DA354	**APPENDIX 10. NOISE COMPLIANCE ASSESSMENT**						
	Applicable Meteorological Conditions						
		1	The noise criteria in Table 1 apply under all meteorological conditions except the following:				
DA355		1 (a)	monitoring locations for the collection of representative noise data;	Lynwood Quarry Annual Environment Review, September 2015. Lynwood Quarry Annual Environment Review, September 2016. Lynwood Quarry Annual Environment Review, March 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, April 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, June 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, September 2017. Noise Monitoring Assessment, Quarterly Lynwood Quarry, Marulan, NSW, December 2017. INX community complaint reports for audit period, including complaints recorded on 21 September 2017 and 27 November 2017.	Noise is measured in four representative locations (as documented in each of the quarterly noise monitoring reports Q1, Q2, Q3 and Q4 2017), and as approved by the Secretary in the NMP.	Compliant	
DA356		1 (b)	wind speeds greater than 3 metres/second at 10 metres above ground level; or	Attended noise surveys are undertaken as part of regular Quarterly Noise Monitoring Assessment Reports.	Noise monitoring is undertaken by suitably qualified acoustic consultant Muller Acoustic Consulting Pty Ltd. All Quarterly Noise Monitoring Assessment Reports state that the assessment has been conducted in accordance with a list of documents, which includes the Industrial Noise Policy (INP), 2000	Compliant	
DA357		1 (c)	stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or	Attended noise surveys are undertaken as part of regular Quarterly Noise Monitoring Assessment Reports.	Noise monitoring is undertaken by suitably qualified acoustic consultant Muller Acoustic Consulting Pty Ltd. All Quarterly Noise Monitoring Assessment Reports state that the assessment has been conducted in accordance with a list of documents, which includes the Industrial Noise Policy (INP), 2000	Compliant	
DA358		1 (d)	stability category G temperature inversion conditions.	Attended noise surveys are undertaken as part of regular Quarterly Noise Monitoring Assessment Reports.	Noise monitoring is undertaken by suitably qualified acoustic consultant Muller Acoustic Consulting Pty Ltd. All Quarterly Noise Monitoring Assessment Reports state that the assessment has been conducted in accordance with a list of documents, which includes the Industrial Noise Policy (INP), 2000	Compliant	

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Unique ID	**Sched**	**Condition**	**Condition text**	**Evidence**	**Comments and recommendations**	**Compliance**	**Holcim Actions To Address Non Compliances**
	Determination of Meteorological Conditions						
DA359		2	Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station required under condition 15A of Schedule 3.		Page 9 of the Quarterly Noise Monitoring Assessment (April 2017) states: "In the event of quarry attributed noise being above criteria, prevailing meteorological conditions for the monitoring period were sourced from the onsite meteorological station and analysed in accordance with Appendix E4 of the INP to determine the stability category present at the time of each attended measurement." Assessment results with the meteorological data are summarised in Table 3, 4, 5 and 6.	Compliant	
	Compliance Monitoring						
DA360		3	Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.	Attended noise surveys are undertaken as part of regular Quarterly Noise Monitoring Assessment Reports.	Assessment Methodology section of the Quarterly Noise Monitoring Assessment Reports states that "The attended noise surveys were conducted in general accordance with the procedures described in Australian Standards AS 1055-1997, "Acoustics - Description and Measurement of Environmental Noise" and the EPL. The methodology section of the following reports was reviewed: Q1 2017 (dated April 2017) , Q2 (dated June 2017), Q3 (dated September 2017), and Q4 (December 2017).	Compliant	
DA361		4	Unless otherwise directed by the Secretary, attended quarterly monitoring is to be used to evaluate compliance with the relevant conditions of this consent.	Attended noise surveys are undertaken as part of regular Quarterly Noise Monitoring Assessment Reports.	The introduction of each Quarterly Noise Monitoring Assessment Report states the following "This assessment has been undertaken during..... and forms part of the annual noise monitoring program to address conditions outlined in the Development Consent."	Compliant	
DA362			*Note: The Secretary may direct that the frequency of attended monitoring increase or decrease at any time during the life of the development.*	-		Note	
DA363		5	Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the INP (as amended from time to time), in particular the requirements relating to:	Attended noise surveys are undertaken as part of regular Quarterly Noise Monitoring Assessment Reports. DPE letter dated 7 December 2016.	All Quarterly Noise Monitoring Assessment Reports state that the assessment has been conducted in accordance with a list of documents, which includes the Industrial Noise Policy (INP), 2000. DPE's letter dated 7 December 2016 approving the latest NMP.	Compliant	
DA364		5 (a)	monitoring locations for the collection of representative noise data;	Attended noise surveys are undertaken as part of regular Quarterly Noise Monitoring Assessment Reports.		Compliant	
DA365		5 (b)	meteorological conditions during which collection of noise data is not appropriate;	Attended noise surveys are undertaken as part of regular Quarterly Noise Monitoring Assessment Reports.	Noise monitoring is undertaken by suitably qualified acoustic consultant	Compliant	
DA366		5 (c)	equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and	Attended noise surveys are undertaken as part of regular Quarterly Noise Monitoring Assessment Reports.	Noise monitoring is undertaken by suitably qualified acoustic consultant	Compliant	
DA367		5 (d)	modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.	Attended noise surveys are undertaken as part of regular Quarterly Noise Monitoring Assessment Reports.	Noise monitoring is undertaken by suitably qualified acoustic consultant	Compliant	

* Evidence provided outside of audit period.