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# Lynwood Quarry Noise Management Plan

Holcim Australia  
2020 Update

# Lynwood Noise Management Plan

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# 1. Introduction

## 1.1 Background

Holcim (Australia) Pty Ltd (Holcim) was granted development consent in December 2005 (DA 128-5-2005) (Development Consent) for Lynwood Quarry west of Marulan in the Southern Tablelands region of NSW (refer to **Figure 1**). The quarry has approval to operate over an initial 30 year period. Modification 5 was approved by the Department of Planning and Environment (DP&E), now Department of Planning, Industry & Environment (DPIE) on 29 May 2017. .

## 1.2 Operations Description

The location and extent of the 30 year quarry pit is shown on **Figure 1**, including the locations of overburden and excess product emplacement areas and project infrastructure.

The quarry has existing Development Consent approval to produce up to five million tonnes per annum (Mtpa) of saleable quarry product until 2038. Up to 5 Mtpa of the product from the project will be transported via the dedicated train loading facility, with up to 1.5 Mtpa of the total 5 Mtpa also approved to be delivered to markets by road transport via the Hume Highway. Some of the material extracted as part of the quarrying process is not suitable for processing or able to be sold, consequently emplacement areas are required. The locations of these emplacement areas are shown on Figure 1.

The quarry will generally operate twenty-four hours per day, seven days per week. Operating hours will be limited for some activities, to reduce potential noise impacts. The operating hours are described in Schedule 3 Condition 5 of the Development Consent and are detailed in **Table 1** below.

**Table 1** Approved hours of operation at Lynwood Quarry

Activity	Day	Time
Construction works	Monday – Friday	7 am to 6 pm
	Saturday	8 am to 1 pm
	Sunday and Public Holidays	None
Topsoil/overburden removal/ emplacement; drilling	Any day	7 am to 6 pm
Blasting	Monday – Saturday	9 am to 5 pm
	Sunday and Public Holidays	None
Extraction	Any day	7 am to 10 pm
Processing (crushing, screening, stockpiling); loading, delivery and distribution; maintenance	Any day	Anytime

Note: Table 1 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.

## 1.3 Purpose and Scope

The purpose of this NMP is to describe the noise management strategies, procedures, controls and monitoring to be implemented in accordance with the Lynwood Quarry Environmental Impact Statement (EIS)(Umwelt, 2005 and Umwelt 2010), the Lynwood Quarry Extraction Area Modification Project Environmental Assessment (Umwelt, 2015) and the Development Consent. The approved quarrying plan has been designed to include several noise mitigation factors and these design mitigation measures are further described in **Section 7**.

This NMP has also been prepared in accordance with all relevant Australian Standards, legislation and DECC approved methods for sampling listed below:

- *AS 1055 - 1997 Acoustics – Description and Measurement of Environmental Noise;*
- *NSW Industrial Noise Policy (DEC 2000); and*
- *AS IEC 61672 – 2004 Electroacoustics – Sound Level Meters.*

#### **1.4 Objectives**

The objectives of this NMP include the following:

- Detail the noise monitoring system to assess noise compliance on surrounding sensitive receivers;
- Detail the controls to be implemented to minimise noise emissions from the site;
- Allow adaptive management of the operation based on real time noise monitoring results and prevailing meteorological conditions;
- Provide a mechanism to assess monitoring results against noise impact assessment criteria and land acquisition criteria to evaluate compliance;
- Establish a continued improvement protocol to for noise performance at Lynwood Quarry;
- Manage noise related community complaints in a timely and effective manner;
- Detail the requirement for reporting noise criteria exceedances to the relevant stakeholders; and
- Detail the independent review process to be followed if Lynwood Quarry receives a written request by a landowner(s) for an independent review of noise impacts.

## **2. Stakeholder Consultation**

### **2.1 Pre 2020 Consultation**

In accordance with Schedule 3 Condition 6 of the Development Consent, this NMP was previously sent to the DPIE in September 2016 for approval.

### **2.2 2020 Consultation**

A copy of the 2019 updated NMP will be sent to the DPIE for review and approval. In an email from the DPIE on 29 January 2020, they requested response to several items. Holcim have addressed these comments with details included in Appendix 1.

### 3. Statutory Requirements

#### 3.1 Development Consent Requirements

A summary of the relevant Development Consent requirements are outlined in the table below.

**Table 2 Summary of Development Consent and EPL Requirements**

Development Consent Condition/EPL Requirement					Relevant Section																																																																																									
<b>Schedule 3</b>																																																																																														
<p><b>Noise impact Assessment Criteria</b></p> <p>Schedule 3 Condition 3</p> <p>The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 1 at any residence on privately-owned land.</p> <table border="1"> <thead> <tr> <th rowspan="2">Noise Assessment Location</th> <th>Day</th> <th>Evening</th> <th colspan="2">Night</th> </tr> <tr> <th>L<sub>Aeq</sub> (15 minute)</th> <th>L<sub>Aeq</sub> (15 minute)</th> <th>L<sub>Aeq</sub> (15 minute)</th> <th>L<sub>A1</sub> (1 minute)</th> </tr> </thead> <tbody> <tr><td>1</td><td>35</td><td>35</td><td>35</td><td>45</td></tr> <tr><td>2</td><td>35</td><td>35</td><td>35</td><td>45</td></tr> <tr><td>3</td><td>35</td><td>35</td><td>35</td><td>45</td></tr> <tr><td>4</td><td>35</td><td>37</td><td>35</td><td>46</td></tr> <tr><td>5</td><td>35</td><td>35</td><td>35</td><td>46</td></tr> <tr><td>6</td><td>35</td><td>37</td><td>36</td><td>46</td></tr> <tr><td>7</td><td>38</td><td>38</td><td>35</td><td>55</td></tr> <tr><td>8</td><td>39</td><td>38</td><td>36</td><td>55</td></tr> <tr><td>9</td><td>39</td><td>39</td><td>37</td><td>56</td></tr> <tr><td>10</td><td>42</td><td>42</td><td>40</td><td>53</td></tr> <tr><td>11</td><td>35</td><td>35</td><td>36</td><td>47</td></tr> <tr><td>12</td><td>37</td><td>37</td><td>36</td><td>47</td></tr> <tr><td>13</td><td>40</td><td>38</td><td>37</td><td>47</td></tr> <tr><td>14</td><td>35</td><td>35</td><td>35</td><td>47</td></tr> <tr><td>15</td><td>35</td><td>35</td><td>35</td><td>47</td></tr> <tr><td>16</td><td>35</td><td>35</td><td>35</td><td>45</td></tr> </tbody> </table> <p><i>Table 1: Noise Criteria dB(A)</i></p> <p>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.</p>					Noise Assessment Location	Day	Evening	Night		L <sub>Aeq</sub> (15 minute)	L <sub>Aeq</sub> (15 minute)	L <sub>Aeq</sub> (15 minute)	L <sub>A1</sub> (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	36	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	Section 6
Noise Assessment Location	Day	Evening	Night																																																																																											
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<b>Operating Conditions</b>																																																																																														
<p>Schedule 3 Condition 4</p> <p>The Applicant must:</p> <p>a) implement best practice management to minimise the operational noise of the development;</p>					Section 7																																																																																									

Development Consent Condition/EPL Requirement	Relevant Section																								
b) implement all reasonable and feasible measures to minimise road transportation noise associated with the development;	Section 7																								
c) minimise the noise impacts of the development during meteorological conditions when the noise criteria in this consent do not apply (see Appendix 10);	Section 7																								
d) carry out regular monitoring to determine whether the development is complying with the relevant conditions of this consent; and	Section 8																								
e) regularly assess noise monitoring data and modify and/or stop operations on site to ensure compliance with the relevant conditions of this consent, to the satisfaction of the Secretary.	Section 7 and 8																								
<b>Operating Hours</b>																									
<p>Schedule 3 Condition 5 The Applicant must comply with the operating hours in Table 2:</p> <table border="1" data-bbox="209 719 1158 1171"> <thead> <tr> <th data-bbox="209 719 523 745">Activity</th> <th data-bbox="528 719 839 745">Day</th> <th data-bbox="844 719 1158 745">Night</th> </tr> </thead> <tbody> <tr> <td data-bbox="209 752 523 860" rowspan="3">Construction works</td> <td data-bbox="528 752 839 779">Monday – Friday</td> <td data-bbox="844 752 1158 779">7am to 6pm</td> </tr> <tr> <td data-bbox="528 786 839 813">Saturday</td> <td data-bbox="844 786 1158 813">8am to 1pm</td> </tr> <tr> <td data-bbox="528 819 839 860">Sunday and Public Holidays</td> <td data-bbox="844 819 1158 860">None</td> </tr> <tr> <td data-bbox="209 866 523 943">Topsoil/overburden removal/emplacement drilling</td> <td data-bbox="528 866 839 943">Any day</td> <td data-bbox="844 866 1158 943">7am to 6pm</td> </tr> <tr> <td data-bbox="209 949 523 1034" rowspan="2">Blasting</td> <td data-bbox="528 949 839 976">Monday – Saturday</td> <td data-bbox="844 949 1158 976">9am to 5pm</td> </tr> <tr> <td data-bbox="528 983 839 1034">Sunday and Public Holidays</td> <td data-bbox="844 983 1158 1034">None</td> </tr> <tr> <td data-bbox="209 1041 523 1068">Extraction</td> <td data-bbox="528 1041 839 1068">Any day</td> <td data-bbox="844 1041 1158 1068">7am to 10pm</td> </tr> <tr> <td data-bbox="209 1075 523 1171">Processing (crushing, screening, stockpiling); loading, delivery, and distribution; maintenance</td> <td data-bbox="528 1075 839 1171">Any day</td> <td data-bbox="844 1075 1158 1171">Anytime</td> </tr> </tbody> </table> <p><i>Table 2: Operating Hours Notes:</i></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p>Construction works within the Hume Highway reserve may be undertaken outside the hours specified in Table 2 with the written approval of the RMS.</p>	Activity	Day	Night	Construction works	Monday – Friday	7am to 6pm	Saturday	8am to 1pm	Sunday and Public Holidays	None	Topsoil/overburden removal/emplacement drilling	Any day	7am to 6pm	Blasting	Monday – Saturday	9am to 5pm	Sunday and Public Holidays	None	Extraction	Any day	7am to 10pm	Processing (crushing, screening, stockpiling); loading, delivery, and distribution; maintenance	Any day	Anytime	Section 1.2
Activity	Day	Night																							
Construction works	Monday – Friday	7am to 6pm																							
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Processing (crushing, screening, stockpiling); loading, delivery, and distribution; maintenance	Any day	Anytime																							
<b>Noise management plan</b>																									
<p>Schedule 3 Condition 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 Schedule 5 Condition 2) this plan must:</p>	Entire Document																								
a) be submitted to the Secretary for approval by 30 November 2016, unless otherwise agreed by the Secretary;	NMP submitted for approval prior to 30 November 2016.																								
<p>b) describe the measures that would be implemented to ensure:</p> <ul style="list-style-type: none"> <li>compliance with the noise criteria in this consent;</li> <li>best practice management is being employed; and</li> </ul> <p>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);</p>	Section 7																								
c) describe the proposed noise management system; and	Section 7 and 8																								



Development Consent Condition/EPL Requirement	Relevant Section
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.	Section 8
e) The Applicant must implement the management plan as approved from time to time by the Secretary.	
<b>Schedule 5 Management Plan Requirements</b>	
Schedule 5 Condition 2 The Applicant must ensure that the Management Plans required under this consent are prepared in accordance with any relevant guidelines, and include:	
a) detailed baseline data;	Section 4
b) a description of: <ul style="list-style-type: none"> <li>• the relevant statutory requirements (including any relevant approval, licence or lease conditions);</li> <li>• any relevant limits or performance measures/criteria; and</li> </ul> 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;	Section 3, Section 6
c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Section 7
d) a program to monitor and report on the: <ul style="list-style-type: none"> <li>• impacts and environmental performance of the development; and</li> <li>•</li> </ul>	Section 8
e) a contingency plan to manage any unpredicted impacts and their consequences;	Section 10
f) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 9 and 10
g) a protocol for managing and reporting any: <ul style="list-style-type: none"> <li>• incidents;</li> <li>• complaints;</li> <li>• non-compliances with statutory requirements; and</li> <li>•</li> </ul>	Section 9
h) a protocol for periodic review of the plan. Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.	Section 11
Schedule 5 Condition 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 shall 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.	Noted
<b>EPL Conditions</b>	
Condition L3.1 Noise Limits See Schedule 3 Condition 3 of Development Consent (same conditions)	This table

Development Consent Condition/EPL Requirement	Relevant Section
<p>Noise from the development is to be measured at 1m from the dwelling façade to determine compliance with the LA1 (1 minute) in the above table.</p> <p>The noise emission limits identified in condition L3.1 apply under meteorological conditions of:</p> <ul style="list-style-type: none"> <li>• Wind speed up to 3m/s at 10m above ground level; or</li> <li>• Temperature inversion conditions of up to 3° C/100m and wind speed up to 2 m/s at 10m above ground level.</li> </ul>	<p>Monitoring requirements outlined in Section 8</p>

### 3.2 EIS Statement of Commitments

The table below outlined the Statement of Commitment requirements.

**Table 3 EIS Statement of Commitment Requirements**

<b>Commitment</b>	<b>Addressed in Section</b>
Noise	Covered under Section 7 and Section 8

## 4. Historical Noise Data

The following section summarises the factors influencing noise associated with Lynwood Quarry, based upon the information provided in Section 6.3.1 of the Lynwood Quarry Intensification in Production Environmental Assessment (EA) (Element Environment 2014).

### 4.1 Existing Noise Environment

Lynwood Quarry has been designed to incorporate a range of noise management measures to minimise the potential for noise impacts on surrounding residential receivers as outlined in previous assessment documents (Umwelt, 2005 and Umwelt, 2010). A detailed Noise Impact Assessment (NIA) was also completed as part of the Modification Project EA (Umwelt 2015) to assess the potential noise impacts of the Modification Project on the existing noise environment. Three representative operational stages were selected for noise modelling Stage 1, Stage 3 and Stage 6. The modelling covered the total quarry operations including the granite pit development and the operation of the entire approved infrastructure (e.g. crushing and screening plant, train loading facility, truck loading and haulage etc.).

The results of the noise impact assessment identified that noise impacts from the operations will meet the existing development consent criteria at all locations except receiver location 11 where a minor 1 dB exceedance is predicted. Noise impacts at this location will be consistent with specific noise levels for the operations calculated in accordance with the INP (EPA, 2000). Future operations at Lynwood Quarry are predicted to be unable to achieve the current approved noise criteria during the night time periods (10 pm to 7 am) due to the inclusion of a night time easterly wind assessable under the INP (EPA, 2000).

No noise exceedances have occurred during the last four Annual Review reporting periods (2017 - 2019).

## 5. Potential Noise Impacts

Noise impacts were assessed for the 2005 EIS and subsequent modifications. Impacts associated with noise could result from construction, operation of the quarry and machinery and transport. Controls relating to noise management are outlined in **Section 7**.

## 6. Noise Assessment Criteria

Noise criteria are expressed as a LAeq (15 min) limit and are specified in the Development Consent and EPL. **Table 4** shows the specific noise criteria.

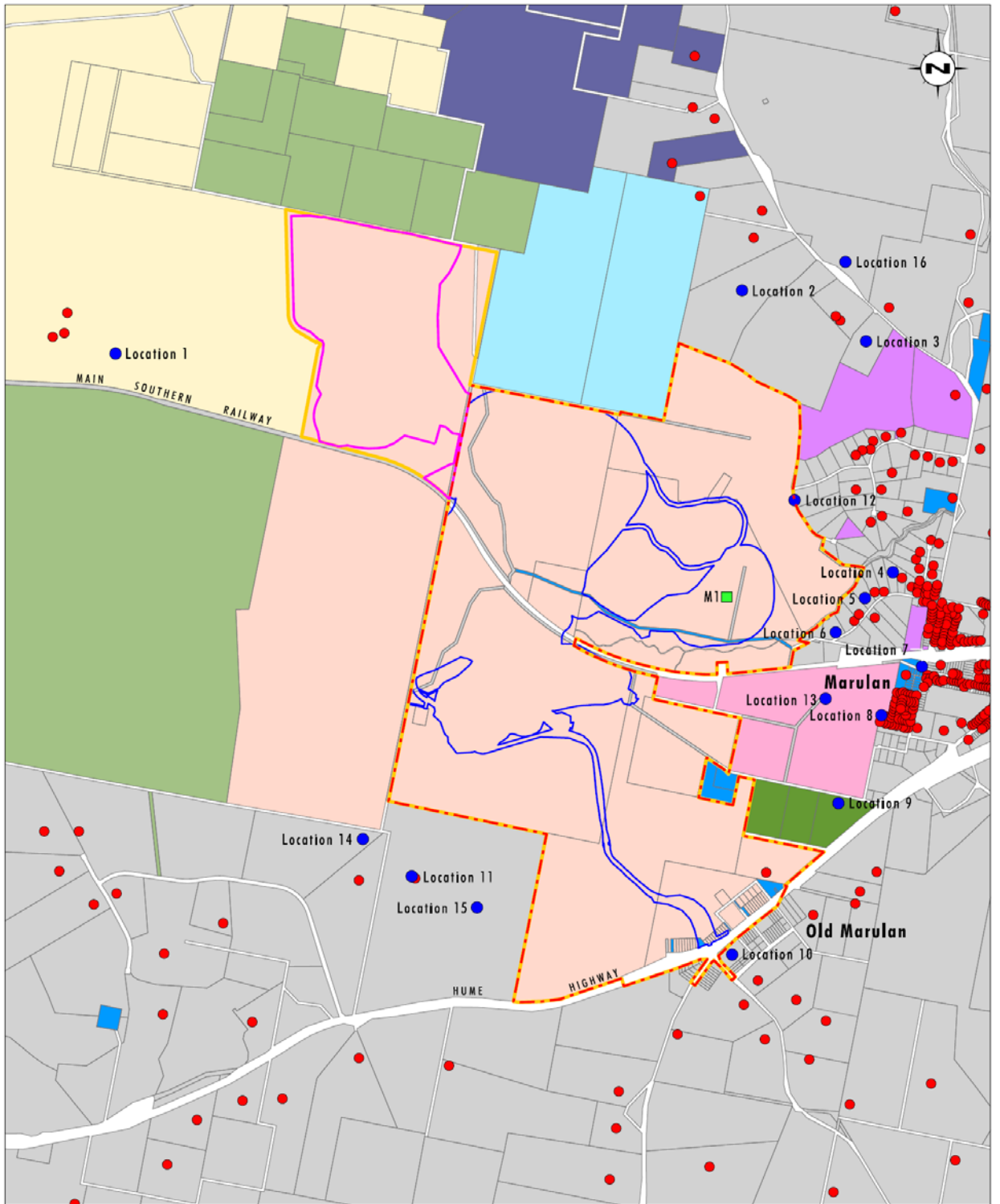
**Table 4** Lynwood Quarry Noise Criteria

Receiver Location	Receiver Description	Noise Criteria			
		Day	Evening	Night	
		LAeq.15min	LAeq.15min	LAeq.15min	LA1.1min
Receiver Location 1	Near Location N1. West of the Granite Pit.	35	35	35	45
Receiver Location 2	North east of the site	35	35	35	45
Receiver Location 3	North east of the site	35	35	35	45
Receiver Location 4	East of the site in Marulan	35	37	35	46
Receiver Location 5	East of the site in Marulan	35	35	35	46
Receiver Location 6	Location N2. East of the site in Marulan	35	37	36	46
Receiver Location 7	East of the site in Marulan	38	38	35	55
Receiver Location 8	East of the site in Marulan	39	38	36	55
Receiver Location 9	East of the site in Marulan	39	39	37	56
Receiver Location 10	South east of the site in Old Marulan	42	42	40	53
Receiver Location 11	Location N3- South of the site	35	35	36	47
Receiver Location 12	Location N4 East of the site in Marulan	37	37	36	47
Receiver Location 13	East of the site in Marulan	40	38	37	47
Receiver Location 14	South of the site	35	35	35	47
Receiver Location 15	South of the site	35	35	35	47
Receiver Location 16	North east of the site	35	35	35	45

Note 1: Noise Criteria dB(A)

The noise receiver locations are shown in **Figure 1**.

## NOISE RECEIVER LOCATIONS



Data Source: LPI (2014), Holcim Australia (2014)

0 0.5 1.0 2.0 km  
1:40 000

### Legend

- |  |  |   |
|--|--|---|
| <span style="border: 1px dashed red; padding: 2px;"> </span> Approved Project Area                         | <span style="background-color: #ADD8E6; border: 1px solid black; padding: 2px;"> </span> Oliveri           | <span style="color: red;">●</span> Residence Location   |
| <span style="border: 1px solid yellow; padding: 2px;"> </span> Modification Project Area                   | <span style="background-color: #FFFFE0; border: 1px solid black; padding: 2px;"> </span> Onions Investment | <span style="color: blue;">●</span> Residence/Noise Receiver  |
| <span style="border: 1px solid blue; padding: 2px;"> </span> Approved Disturbance Footprint                | <span style="background-color: #D3D3D3; border: 1px solid black; padding: 2px;"> </span> Private Land      | <span style="background-color: #00FF00; border: 1px solid black; padding: 2px;"> </span> Holcim Weather Station |
| <span style="border: 1px solid magenta; padding: 2px;"> </span> Proposed Granite Pit Disturbance Footprint | <span style="background-color: #4682B4; border: 1px solid black; padding: 2px;"> </span> Gunlake           |   |
| <span style="background-color: #0000FF; border: 1px solid black; padding: 2px;"> </span> Crown Land        | <span style="background-color: #90EE90; border: 1px solid black; padding: 2px;"> </span> Ranken Investment |   |
| <span style="background-color: #FFB6C1; border: 1px solid black; padding: 2px;"> </span> Tailored Property | <span style="background-color: #3CB371; border: 1px solid black; padding: 2px;"> </span> Rawson            |   |
| <span style="background-color: #FFDAB9; border: 1px solid black; padding: 2px;"> </span> Holcim Australia  | <span style="background-color: #DDA0DD; border: 1px solid black; padding: 2px;"> </span> South Creek Dairy |   |

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**Figure 1**  
Land Ownership, Residence Location and Background Noise Monitoring Locations

## 7. Noise Management

Lynwood Quarry is committed to implementing reasonable and feasible best practice noise mitigation measures and investigating ways to minimise operational noise.

In order to mitigate any potential noise impacts from the operation, a number of management controls will be implemented throughout the life of the operation. These controls are outlined in:

- The Lynwood Quarry extraction area modification EA (Umwelt 2015);
- The Development Consent noise management conditions (Schedule 3 Conditions 3-6);
- General management plan requirements listed in Schedule 5 Conditions 2-3 of the Development Consent;
- The Development Consent Noise Compliance Assessment (Appendix 10 of the Development Consent); and
- The Development Consent Statement of Commitments (Appendix 11 of the Development).

The effectiveness of the implementation of these controls will be reported as part of the Lynwood Quarry Annual Review.

The relevant noise controls for the operation are detailed in **Table 5**.



**Table 5 Noise Mitigation Measures**

Mitigation ID	Mitigation Measure	Reference Document	When Required	Responsibility
<b>Hours of operation</b>				
N1	Noise amenity for sensitive receivers in the vicinity of Lynwood Quarry has been managed by restricting hours of operation.	Existing Lynwood Quarry NMP	For the life of the quarry.	Quarry Manager
<b>Design Controls</b>				
N2	The presence of buffer land adjacent to the Lynwood Quarry	Existing Lynwood Quarry NMP	For the life of the quarry.	Quarry Manager
N3	The crushing and screening facilities are enclosed by buildings	Existing Lynwood Quarry NMP	For the life of the quarry.	Quarry Manager
N4	The scalps screen has a rubber screen deck	Existing Lynwood Quarry NMP	For the life of the quarry. Continued maintenance required.	Maintenance Manager
<b>Operational Controls</b>				
N5	The use of broad band reversing alarms instead of beeper style alarms on all mobile equipment	2015 EA MOD/ Development Consent/ Existing Lynwood Quarry NMP	For the life of the quarry.	Quarry Manager
N6	The management of mobile machines during adverse weather conditions when wind conditions or inversion conditions enhance the noise propagation towards sensitive receiver locations. This could include but not be limited to: <ul style="list-style-type: none"> <li>ensuring the sales loader operates behind the product stockpile during adverse weather conditions in the evening and night time period; and</li> <li>moving quarrying activities to locations deeper in the quarry pit during adverse weather conditions and ceasing operations in exposed area (e.g. on the face of the overburden emplacement areas).</li> </ul>	2015 EA MOD/ Development Consent/ Existing Lynwood Quarry NMP	For the life of the quarry.	Quarry Manager
N7	Regular inspection and maintenance of noise attenuation systems on quarry equipment.	2015 EA MOD/ Development Consent/	Daily inspections.	Pit & Production Managers

Lynwood Noise Management Plan

Mitigation ID	Mitigation Measure	Reference Document	When Required	Responsibility
		Existing Lynwood Quarry NMP		
N8	Implementation of a process for periodic review of noise performance of equipment.	2015 EA MOD/ Development Consent/ Existing Lynwood Quarry NMP	Review required based on noise monitoring results, non-compliances and complaints.	Quarry Manager

## 8. Noise Monitoring

Noise monitoring requirements for the operation are provided in Schedule 3 Condition 6d of the Development Consent. Noise monitoring is required to be assessed against the noise compliance assessment information provided in **Section 6**. The noise monitoring locations for Lynwood are shown on **Figure 2**.

The Lynwood Quarry noise monitoring program will be used to:

- Measure compliance; and
- Determine whether a modifying factor should be applied to the contributing quarry noise levels (in accordance with the INP).

### 8.1 Noise Monitoring Locations

**Table 6 Summary of Noise Monitoring Locations**

Monitoring Locations	Description
N1	Residence west of the project area
N2	Maclura Drive, Marulan
N3	Residence to the south of the site
N4	North-eastern boundary of project area at rural residential subdivision

Note: monitoring locations are subject to consultation and agreement with the occupier for each specific residence.

The results of quarterly noise monitoring will be compared with the noise criteria defined in **Section 6** to determine whether Lynwood Quarry is in compliance. The results will also be compared with the Noise Compliance Assessment information provided in Appendix 10 of the Development Consent (refer to Section 5.1.1). Attended monitoring will record:

- Operator's name;
- Monitoring location;
- Dates and times that monitoring began and ended at each location;
- Height of the microphone above the ground and, if relevant, distances to building facades or property boundaries;
- Qualitative/quantitative meteorological data such as temperature, wind speed, wind direction, cloud cover, humidity, fog, rainfall or opinions as to the onset or breakup of temperature inversions;
- Instrument calibration details before and after the monitoring period;
- The LAeq,15minute noise level for the 15 minute period;
- Statistical noise level descriptors over the 15 minute interval: LAmin, LA90, LA10, LA1 and LAmax;
- LA1,1minute noise levels (to allow comparison with the relevant sleep arousal criteria);
- Notes that identify the noise source that contribute to the peak noise levels (LA1 or LAmax) and noise sources that contribute to the overall noise environment or for periods of time when a specific noise source is audible presented on a run-chart of the recorded noise levels;
- An estimate of the noise contribution from operations at Lynwood Quarry or from other identifiable noise sources;
- Measurements in one-third octave bands for the 15 minute interval to assess if any of the noise sources exhibit tonal characteristics that may require modifying factors to be applied; and

- Data suitable for assessing the relative contribution of quarry-generated noise to the overall noise being measured.

### **8.1.1 Noise Compliance Assessment**

In accordance with the methodology outlined in section 3.4 of the INP (EPA 2000) and the noise criteria provided in **Table 4** applies under all meteorological conditions except for the following:

- Monitoring locations for the collection of representative noise data;
- Wind speeds greater than 3 metres / second at 10 metres above ground level;
- Stability category F temperature inversion conditions and wind speeds greater than 2 metres / second at 10 metres above ground level; and
- Stability category G temperature inversion conditions.

### **8.2 Meteorological Monitoring**

Meteorological data is sourced from the Lynwood Quarry weather station (refer to **Figure 2**). The location of the weather station complies with AS 2922-1987: *Ambient Air- Guide for the Siting of Sampling Units*.

The meteorological monitoring data obtained from the station will be obtained in accordance with the requirements of Schedule 3 Condition 15A of the Development Consent.

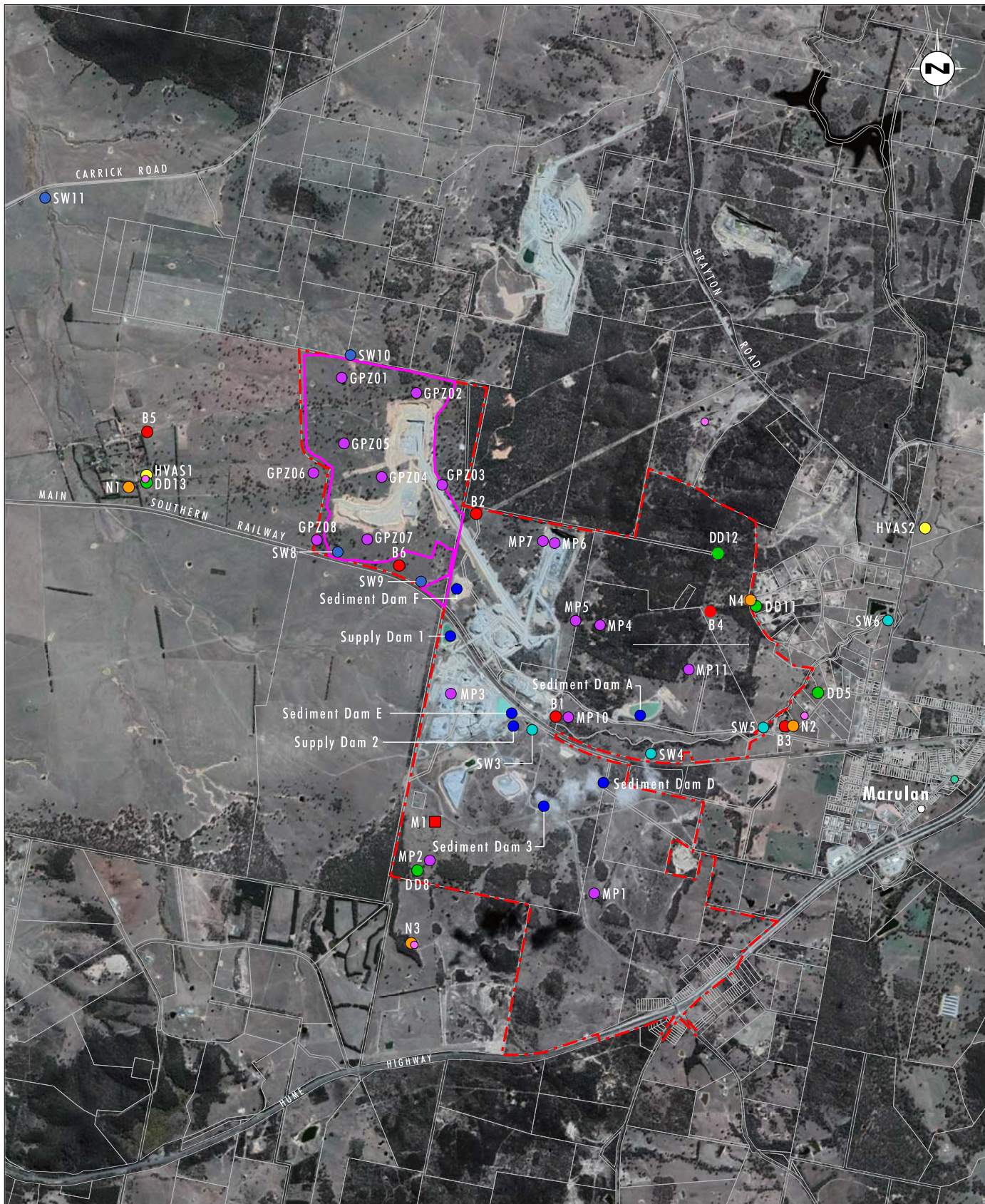


Image Source: Google Earth (2018)  
 Data Source: LPI (2014), Holcim Australia (2015)

0 0.5 1.0 2.0 km  
 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 2**  
**Environmental Monitoring Network**

## 9. Reporting and Compliance Management

### 9.1 External Reporting

A summary of noise monitoring results will be provided in the Lynwood Quarry Annual Review.

The Annual Review will be made available to the public through the CCC and the Lynwood Quarry web site. Other statutory reporting (e.g. Environment Protection Licence annual return) will be completed on an as needs basis.

In addition, in accordance with *Protection of the Environment Legislation Amendment Act 2011* (Amendment Act) and Schedule 5 Condition 13 of the Development Consent, Holcim will also publish noise monitoring results on the Holcim website (<http://www.holcim.com.au>).

Performance monitoring, which includes an assessment of the effectiveness of noise monitoring and compliance with the relevant Development Consent and EPL conditions, may be discussed at Community Consultative Committee (CCC) meetings.

### 9.2 Noise Criteria Exceedance Reporting Protocol

Exceedances of noise criteria will be managed in accordance with the Lynwood EMS which includes a procedure for the management of environmental incidents and community complaints. If a non-compliance is identified, the Support Services Supervisor will be responsible for implementing an appropriate investigation and determining appropriate corrective and preventative actions. The effectiveness of corrective and/or preventative actions implemented following a non-compliance will be reviewed by the Support Services Supervisor in conjunction with the Quarry Manager.

Following the reporting of subsequent review, should it be concluded that the Quarry is the source of elevated noise results, the continuous improvement process outlined in the EMS is to be implemented and corrective actions identified.

The occurrence of non-compliances and subsequent corrective and preventative actions will be reported to the Quarry Manager and in accordance with Holcim reporting processes. Should the non-compliance relate to a statutory limit, appropriate statutory reporting processes will be followed in accordance with Schedule 5 Condition 8 of the Development Consent and the conditions of any other relevant approvals.

A summary of the process is outlined below. If the monitoring results are found to be outside the sites noise criteria the Quarry Manager will initiate the following protocol:

- As soon as becoming aware of the breach of results the Quarry Manager will notify the Holcim NSW Planning and Environment Manager and enter the incident into INX.
- The Quarry Manager will notify the Secretary of the DPIE of the EPA of the incident as soon practicable.
- A report will be prepared and submitted by the Quarry Manager to the DPIE and EPA within 7 days of becoming aware of the incident, this report will include:
  - Cause of the non-compliance.
  - Environmental Harm caused due to the non-compliance.
  - Actions undertaken to rectify the non-compliance and ensure.

Additionally, in accordance with Schedule 4 Condition 1 of the Development Consent, in the event an exceedance of the noise impact assessment criteria is identified, Holcim will notify any affected

landowner(s). Holcim will outline the cause of the non-compliance and the proposed mitigation measures to reduce the likelihood of a non-compliance occurring. Any actions relating to non-compliances will be outlined in the Annual Review.

### **9.3 Complaint Response**

Complaints relating to noise from Lynwood Quarry are to be managed in accordance with the requirements of the Lynwood Quarry EMS. A summary of complaints will be available to regulatory authorities on request, published on the Holcim (Australia) website, provided in the Annual Review.

### **9.4 Training**

All employees and contractors working on site will undergo a site induction and training, which will cover issues relating to noise management, including:

- The existence and requirements of this Plan;
- Noise control measures;
- Location of sensitive receivers;
- Complaints reporting.

Further details regarding staff induction and training are outlined in the EMS.

## 10. Adaptive Management

In accordance with Schedule 5 Condition 6 of the Development Consent, Holcim (Australia) will assess and manage noise related risks to ensure compliance with the criteria outlined in **Section 6**.

Where a non-compliance relating to noise criteria has occurred, Holcim will, to the satisfaction of the secretary of the DPIE:

- Take all reasonable and feasible measures to ensure the exceedance ceases and does not recur
- Consider all reasonable and feasible options for remediation (where relevant) and submit a report to the DPIE describing those options and any preferred remediation measures or other course of action
- Implement mitigation measures as directed by the Secretary of DPIE.

Complaints will be managed in accordance with **Section 9.3**.



## 11. Review and Improvement

This NMP will be reviewed, and revised as necessary, in accordance with the requirements of Schedule 5 Condition 5 of the Development Consent which states “*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.”*

A summary of noise monitoring results will be outlined in the Annual Review.

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. Details on the requirements to prepare Annual Reviews are outlined in the Environmental Management Strategy.

Updated versions of management plans will be put on the website once approved.

## 12. Definitions

The terminology utilised within this NMP is defined in Table 4 below.

**Table 7 Terminology Utilised within the NMP**

<b>Term</b>	<b>Definition</b>
Daytime	In relation to noise criteria it is the period 7.00 am to 6.00 pm Monday to Saturday and 8.00 am to 6.00 pm Sundays and public holidays.
Decibel dB(A)	A decibel scale, weighted so that it takes into account the frequency response of the normal human ear.
Evening	In relation to noise criteria is the period 6.00 pm to 10.00 pm.
LAeq (Period)	The average equivalent noise level, measured in dB(A), during a measurement period (e.g. 15 minute, day, evening or night).
LA1	The noise level, measured in dB(A), which is exceeded for 1 per cent of the measurement period.
LA10	The noise level, measured in dB(A), which is exceeded for 10 per cent of the time.
LA90	The noise level, measured in dB(A), which is exceeded for 90 per cent of the time, referred to as the background noise level.
Night	In relation to noise criteria it is the period 10.00 pm to 7.00 am Monday to Saturday and 10.00 pm to 8.00 am Sundays and public holidays.
Non-Compliance	Occurs when environmental monitoring results fall outside acceptable regulatory limits (i.e. Project Approval or EPL criteria).

### 13. Roles and Responsibilities

Environmental management at Lynwood Quarry will be the responsibility of all employees and contractors, with the Lynwood Quarry Manager having overall responsibility for environmental management of the operations. Environmental roles and responsibilities for project personnel are outlined below, with additional responsibilities contained within the respective environmental management plans.

Environmental responsibilities are included in the position descriptions of all employees at Lynwood Quarry. General environmental responsibilities for key personnel at Lynwood Quarry are outlined in **Table 8**.

**Table 8 Noise Management responsibilities at Lynwood Quarry**

Roles	Accountabilities for this document
Lynwood Quarry Manager	<ul style="list-style-type: none"> <li>• Approve appropriate resources for the effective implementation of this plan.</li> </ul>
Lynwood Pit Manager	<ul style="list-style-type: none"> <li>• Provide sufficient resources for the implementation of this plan;</li> <li>• Coordinate the implementation of blast management controls and strategies in accordance with this Plan;</li> <li>• Coordinate the blast monitoring requirements of this Plan, and evaluate and report monitoring results as required;</li> <li>• Coordinate noise related incident investigations and reporting as required by legislation and internal standards and guidelines; and</li> <li>• Coordinate the review of this plan in accordance with the requirements of the Development Consent.</li> </ul>
Lynwood Quarry Support Services Supervisor	<ul style="list-style-type: none"> <li>• Implement and maintain the Management Plan,</li> <li>• In consultation with the Quarry Manager, undertake liaison with regulatory authorities and the community in relation to environmental matters.</li> </ul>
Holcim Planning and Environment Co-ordinator	<ul style="list-style-type: none"> <li>• Assist in the coordination of noise related incident investigations and reporting as required by legislation and internal standards and guidelines; and</li> <li>• Assist with the review of this Plan.</li> </ul>

## 14. References

Environment Protection Agency, 2000. *Industrial Noise Policy - Environmental Noise Management*, Chatswood.

Standards Australia, 1055 - 1997 *Acoustics – Description and Measurement of Environmental Noise*;

Standards Australia, IEC 61672 – 2004 *Electroacoustics – Sound Level Meters*.

Umwelt (Australia) Pty Limited 2015, Environmental Assessment Lynwood Quarry Extraction Area Modification. Prepared for Holcim (Australia) Pty Limited.

## 15. Change Information

Version	Date	Change Summary
1	September 2016	Original document
2	December 2019	<p>Review of the template for all Lynwood management plans;</p> <ul style="list-style-type: none"> <li>• General structure updates;</li> <li>• Updated monitoring figure and residential receivers;</li> <li>• Section 2- Consultation;</li> <li>• Section 3 – Statutory requirements – separate section;</li> <li>• Section 4 – update to baseline information;</li> <li>• Section 5 – Addition of potential impacts section;</li> <li>• Section 7 – inclusion of responsibilities and timing for controls. Additional controls added.</li> <li>• Section 10 – addition of adaptive management information; and</li> <li>• Section 15 – inclusion of change information.</li> </ul> <p>The following did not change:</p> <ul style="list-style-type: none"> <li>• No change to monitoring or reporting requirements.</li> </ul>
3	February 2020	Response to DPIEs comments. Addition of <b>Appendix 1</b> .

