

# TIMOR LIMESTONE QUARRY

## ANNUAL ENVIRONMENTAL MANAGEMENT REPORT 2018

*Prepared by:*

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May 2019

*For:*

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## DISTRIBUTION DETAILS

Date	Document Title	Distribution List
30 May 2019	Timor Limestone Quarry Annual Environmental Management Review 2018	Upper Hunter Shire Council (UHSC)
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## TITLE DETAILS

Title Details	
<b>Name of Mine</b>	Timor Limestone Quarry
<b>Mining Title / Leases</b>	ML 1660
<b>Expiry Date</b>	23 November 2032
<b>Name of Leaseholder</b>	Stoneco Pty Ltd
<b>Name of Mine Operator (if different)</b>	N/A
<b>Postal Address</b>	PO Box 708 SCONE NSW 2337
<b>Telephone/fax/email</b>	Phone: 02 6545 2222 / Fax: 02 6545 2444
Land Ownership and Land Use Boundaries	
<b>Land Owner/Occupier</b>	Stoneco Pty Ltd
<b>Tenure</b>	Freehold
<b>Pre-mining land use</b>	Agricultural Grazing
Consent and Licences	
<b>Local Council Area</b>	Upper Hunter Shire (UHS) Council
<b>Development Consent</b>	Development Consent (DA) 308/08
<b>Do licences granted by other agencies apply to the mine activities?</b>	EPA (EPL 13397) UHSC (DA308/08)
MOP and AEMR Period	
<b>MOP Commencement Date</b>	31 May 2014
<b>Completion date (nominal)</b>	31 May 2021
<b>AEMR Start Date</b>	1 January 2018
<b>End date</b>	31 December 2018
Signatures	
Leaseholder	Signature:
	Name: Scott Murdoch
	Date:
Environmental Officer	Signature:
	Name: Heath Fletcher
	Date:

## 1 BACKGROUND

*This section provides a description of the Timor Quarry site and outlines the regulatory requirements for the AEMR.*

### 1.1 SITE DESCRIPTION

Timor Limestone Quarry (Timor Quarry) is located 29 km east of Blandford in the Upper Hunter Shire Council area (UHSC) of NSW.

Operations are generally undertaken in accordance with Development Consent DA308/08, it's supporting Environmental Impact Statement (EIS) (R.W. Corkery & Co Pty Limited, 2008), Mining Lease (ML) 1660 (granted in November 2011) and EPL13397.

ML 1660 is located wholly within freehold land, principally owned by Stoneco Pty Ltd (Stoneco) (Lot 11 DP 1161503) and a smaller area owned by another private landholder (Lot 10 DP 1161503).

DA308/08 generally approves the following activities:

- Construction of a site access road and intersection with Timor-Crawney Road;
- Extraction of limestone from an identified 24 Million tonne (Mt) resource for up to 30 years;
- Extraction is to occur within a nominated 4 ha extraction area via drill and blast methods at rates up to 100,000 tonnes per annum (tpa);
- Crushing and screening of limestone within the extraction area and/or plant area;
- Transportation of crushed product directly to customers or to a processing plant located in the Scone Business Park; and
- Rehabilitation.

Figure 1 illustrates the general layout of the site.

## 1.2 AEMR REQUIREMENTS

This Annual Environmental Management Report (AEMR) has been prepared generally in accordance with the document 'Investment - *Preparation of an Annual Environmental Management Report: Small Mine Version Guidelines*' (DRE, 2012). In addition, Timor Quarry's DA308/08 outlines several specific requirements to be included in the AEMR. These requirements, as well as where each is addressed in the AEMR are outlined in **Table 1**.

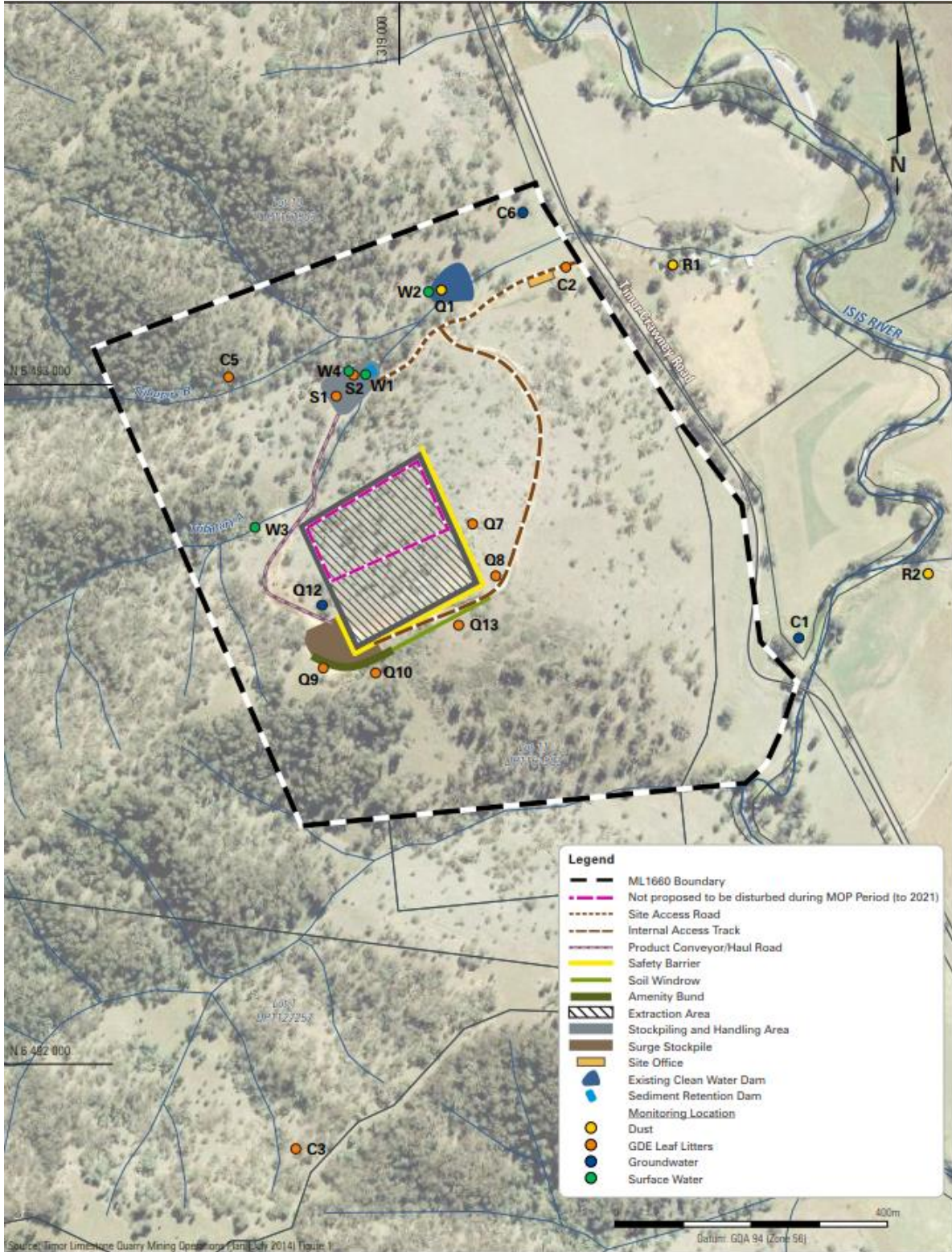
This AEMR has been prepared for the "Reporting Period" of 1 January 2017 to 31 December 2018.



**Table 1**  
**DA 308/08 AEMR Requirements**

Description	Where Addressed
<p><b>S6.2 Annual Environmental Management Report</b></p> <p>At the end of each 12 month period calculated from the commencement of quarrying on the Project Site, the Applicant shall submit an AEMR to the relevant government agencies and to the satisfaction of the Council. This report must:</p>	<p><b>This Report</b></p>
(a) identify the standards and performance measures that apply to the development;	<p><b>Section 1.2 &amp; Section 4</b></p>
(b) include a summary of the complaints received during the past year, and compare this to the complaints received in the previous 5 years;	<p><b>Section 5</b></p>
(c) include a summary of the monitoring results on the development during the past year;	<p><b>Section 4</b></p>
d) include a comprehensive review of these monitoring results against the relevant:	<p>-</p>
(i) limits/criteria in this consent;	<p><b>Section 4</b></p>
(ii) monitoring results from previous years; and	<p><b>Section 4</b></p>
(iii) relevant predictions in the EIS and Specialist Consultant Studies Compendium;	<p><b>Section 4</b></p>
(e) identify any trends in the monitoring results over the life of the development;	<p><b>Section 4</b></p>
(f) identify and discuss any non-compliance during the previous year; and describe what actions were, or are being, taken to ensure compliance. These actions may include proposed amendments of management plans, to be proposed, approved and implemented as specified in conditions S1.2.4, S1.2.5 and S1.2.6.	<p><b>Section 4</b></p>
(g) describe the works that were carried out in the past year, and the works that are proposed to be carried out over the next year; and	<p><b>Section 2</b></p>
(h) describe what measure will be implemented over the next year to improve the environmental performance of the approved operations; and	<p><b>Section 4 &amp; Section 6</b></p>
(i) include the data, findings and recommendations referred to in conditions S1.12.11 and S1.12.12, and confirm the action taken by the quarry owner to implement those recommendations, as required by condition S1.12.15.	<p><b>N/A</b></p>

**Figure 1**  
**Timor Limestone Quarry Site Layout**



Source: Timor Limestone Quarry Mining Operations Plan (July 2014) Figure 1

TIMOR LIMESTONE QUARRY

Timor Limestone Quarry Site Layout

### 1.3 REGULATORY CONSULTATION

Timor Quarry operates in accordance with the Mining Operations Plan (MOP) and the following approved management plans:

- Groundwater Dependant Ecosystem Sampling Protocol;
- Air Quality Management Plan;
- Biodiversity Management Plan;
- Mine Rehabilitation Closure Plan; and
- Mine Closure Plan.

This AEMR has been prepared in accordance with the requirements outlined in **Section 1.2**.

## 2 MINING OPERATIONS DURING THE REPORTING PERIOD

*This section details the production, waste and rehabilitation activities at the Timor Quarry during the Reporting Period.*

### 2.1 SUMMARY

Stoneco indicates work on site commenced on 1 July 2011, with the first extraction undertaken 5 September 2014.

A brief description of operations during the Reporting Period is as follows:

- No land clearing occurred during this period;
- Ore extraction during this period is within the defined extraction are  
 Product processing and sales during the 2018 Reporting Period have experienced an increase in line with 2017 prediction
- Three to four staff on site.

**Table 2** outlines the production and waste summary to date.

**Table 2**  
**Production & Waste Summary**

Material (Tonnes/ annum)	Cumulative Production tonnes per annum					Reporting Period (2018)	Next reporting period (Forecast)
	1 July 2011 to 4 Sept 2014	5 Sept 2014 to Dec 31 2014	Previous Reporting Period (2015)	Previous Reporting Period (2016)	Previous Reporting Period (2017)		
Topsoil stripped	0	250	400	0	0	0	0
Topsoil Used/spread	0	0	0	0	0	0	0
Waste Rock	0	0	0	0	0	0	0
Ore	0	0	200	2,093	9,321.91	26900	35,000
Processing Waste	0	0	0	0	0	0	0
Product (units)	0	0	200	2,093	9,321.91	26900	35000

### 2.2 REHABILITATION

There was no rehabilitation during the Reporting Period.

## 2.3 FURTHER DEVELOPMENT OF THE REHABILITATION PLAN

There was no rehabilitation conducted during the Reporting Period due to active operational area. **Table 3** provides the rehabilitation summary and Error! Reference source not found. outlines maintenance activities on rehabilitated land.

**Table 3**  
**Rehabilitation Summary**

	Cumulative Area Affected (hectares)		
	To date	Last Report	Next Report (Estimated)
<b>A: MINE LEASE AREA</b>	58.64	Unchanged	Unchanged
<b>B: DISTURBED AREAS</b>			
<b>B1 Infrastructure area</b> other disturbed areas to be rehabilitated at closure including facilities, roads	0.55	0.55	0.55
<b>B2: Active Mining Area</b> excluding items B3 - B5 below	1.55	1.55	1.55
<b>B3 Waste emplacements,</b> active/unshaped/in or out-of-pit	0	0	0
<b>B4 Tailings emplacements,</b> active/unshaped/uncapped	0	0	0
<b>B5 Shaped waste emplacement</b> (awaits final vegetation)	0	0	0
<b>ALL DISTURBED AREAS</b>	2.10	2.10	2.10
<b>C: REHABILITATION PROGRESS</b>			
<b>C1 Total Rehabilitated area</b> (except for maintenance)	Nil Rehab – Operational Area	Nil Rehab – Operational Area	0
<b>DC: REHABILITATION ON SLOPES</b>			
<b>D1 10 to 18 degrees</b>	0	0	0
<b>D2 Greater than 18 degrees</b>	0	0	0
<b>E: SURFACE OF REHABILITATED LAND</b>			
<b>E1 Pasture and grasses</b>	0	0	0
<b>E2 Native forest/ecosystems</b>	0	0	0
<b>E3 Plantations and crops</b>	0	0	0
<b>E4 Other</b> (include non-vegetative outcomes)	Note period of very above average dry period 2018	Note period of very above average dry period 2017	Further weed spraying planned under review with HLM

*N/A - Not applicable, site in construction phase.*

**Table 4**  
**Maintenance Activities on Rehabilitated Land**

Nature of Treatment	Area Treated (hectares)		Comment/control strategies/ treatment detail
	Report period	Next period	
<b>Additional erosion control works</b> (drains re-contouring, rock protection)	Rock Armour	Ongoing	Placing rip rap in drains to reduce turbidity
<b>Re-covering</b> (detail - further topsoil, subsoil sealing, etc.)	Nil	Nil	Active Operation Area
<b>Soil treatment</b> (detail - fertiliser, lime, gypsum etc.)	Nil	Nil	-
<b>Treatment/Management</b> (detail - grazing, cropping, slashing etc.)	Nil	Operations	Under review depending on seasonal conditions and bushfire risk
<b>Re-seeding/Replanting</b> (detail - species density, season etc.)	nil	Yes	Growing of Native Seeds in nursery for planned planting mid-2017.  Hi mortality on planting due to drought. Review of planned planting during 2018 pending improved rainfall
<b>Adversely Affected by Weeds</b> (detail - type and treatment)	no	Planned	Further Weed spraying by Hunter Land Management planned early 2018-19
<b>Feral animal control</b> (detail - additional fencing, trapping, baiting etc.)	Nil	Nil	Site Management Adaptive

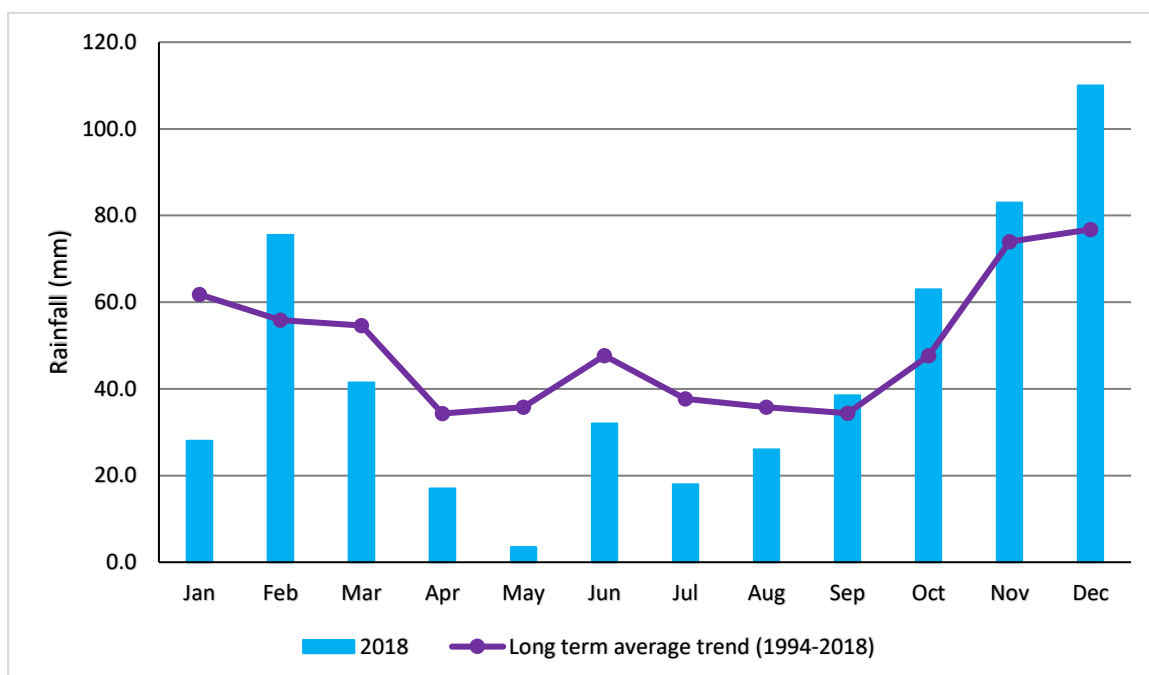
### 3 METEOROLOGICAL DATA

#### 3.1 RAINFALL

A rain gauge was installed in the Plant area (SHA) in May 2016. The rain gauge is a Nylex 250mm. Rainfall data is incorporated in the monthly reports. **Figure 2** presents the 2018 monthly rainfall.

A comparison of 2018 monthly rainfall is displayed against the long-term average in **Figure 2**. A total of 536 mm of rainfall was recorded in 2018, lower than the long-term average of 596.5 mm (at the Scone Airport AWS). The highest monthly rainfall (110 mm) was recorded in December, with higher than average rainfall also experienced from February and September and November 2018.

**Figure 2**  
**2018 Monthly Rainfall**



*\*Long term average Scone AWS*

#### 3.2 TEMPERATURE

Monthly minimum and maximum temperatures, recorded in 2018 at the Scone Airport AWS are shown in **Table 5**, together with historic averages. The temperatures are typical of a temperate climate, with warmer summer months December to March and cooler winter months from June to August.

The monthly average minimum and maximum temperatures for 2018 were 10.9°C and 26.4°C, respectively. Temperatures recorded in 2018 are similar those which have been experienced historically.

**Table 5**  
**Monthly Temperatures 2018**

<b>Month</b>	<b>Monthly Minimum Temperature (°C)</b>	<b>Historic Average* Minimum (°C)</b>	<b>Monthly Maximum Temperature (°C)</b>	<b>Historic Average* Maximum (°C)</b>
January	18.1	16.9	35.7	31.6
February	16.6	16.6	33.1	30.6
March	16.0	14.3	30.4	28.0
April	12.7	10.1	27.8	24.6
May	5.8	6.6	21.9	20.4
June	4.8	4.8	17.2	17.0
July	2.4	3.3	19.0	16.6
August	3.5	3.6	19.8	18.7
September	7.4	6.7	23.4	22.2
October	11.9	9.6	26.4	25.3
November	14.4	13.1	29.4	28.1
December	16.6	15.3	32.8	30.1
<b>Average</b>	<b>10.9</b>	<b>10.1</b>	<b>26.4</b>	<b>24.4</b>

\*Scone Airport AWS from 1991.



## **4 ENVIRONMENTAL PERFORMANCE**

*This section outlines the key environmental control and monitoring strategies in place at Timor Quarry. The locations of monitoring points referred to in this section are shown on*

Figure 1.

## 4.1 SURFACE WATER

### 4.1.1 Background

Stoneco has developed a Soil and Water Management Plan (SWMP) in accordance with DA 308/08. The SWMP describes the surface water management infrastructure and environmental procedures in place at Timor Quarry including the:

- Surface water monitoring program; and
- Erosion and sediment control.

The requirement to monitor surface water quality is also contained in DA 308/08 Condition S1.11.1 which requires Stoneco to regularly monitor “*..surface water quality upstream and downstream of the development..*”

Timor Quarry’s surface water monitoring locations are shown on

Figure 1 and include:

- One monitoring location on Tributary A, 100 m west of the dam (W1);
- One monitoring location at the Dam (W2);
- One monitoring location on Tributary A (W3), 200 m west of the dam; and
- One monitoring location in the sediment basin of the Plant area (W4).

The sediment basin was constructed with the 'Blue Book' specification type D/F, in accordance with Timor Soil Water Management Plan 3.4.5 {Sediment Retention}.

#### 4.1.2 EIS Predictions

Section 4.2.5 of the EIS concludes “ *the proposal would be unlikely to significantly impact on surface water quality or availability to landholders downstream of the Project Site or environmental flows within the local water courses.*”

The EIS outlines the following key parameters to be analysed in surface water samples:

- Total Suspended Solids (goal: <50mg/L);
- Electrical Conductivity (goal: <1500 µS/cm);
- Biochemical Oxygen Demand (goal: <20mg/L);
- pH (goal: between 6.5 and 8.5); and
- Oil and Grease (goal: <10mg/L).

#### 4.1.3 Long Term Baseline

Surface water baseline data was collected from three sampling events conducted from March 2011 to July 2014. The results indicate that one sample was collected from each surface water monitoring location during this period (refer to **Table 6**). The monitoring locations were noted as dry or with algae present during the other sampling occasions. It is noted that Biochemical Oxygen Demand (BOD) in the baseline sample for W1 is 24 mg / L, which is 4 mg / L above the relevant criteria of 20 mg / L. This can be expected as all surface water sampling locations are stagnant and not running water.

#### 4.1.4 Monitoring Results for Reporting Period

**Table 6** outlines the surface water monitoring results for all samples from April 2015. Two surface water samples were collected and analysed during the Reporting Period. Stoneco has advised there were no breaches of internal sediment controls during the Reporting Period.

Non-compliance with discharge criteria was recorded from W2 during April 2018. This exceedance was for Total Suspended Solids. It was observed at the time of sampling the Dam was only 10% full with high turbidity leading to high results (see Appendix A). This exceedance is bolded in Table 6. No other samples were collected during the reporting period due to dry sampling locations.

**Table 6**  
**Surface Water Monitoring Results**

Location	Pollutant	Discharge Criteria**	Monitoring Period								
			Baseline^	Apr 2015	Oct 2015	Apr 2016	Oct 2016	Apr 2017	Oct 2017	Apr 2018	Oct 2018
W1	EC (µS / cm)	1,500	310	NS	NS	NS	349	187	NS	NS	NS
	Total suspended solids (mg / L)	50	16	NS	NS	NS	5	<b>470<sup>®</sup></b>	NS	NS	NS
	pH	6.5 – 8.5	6.9	NS	NS	NS	7.8	7.8	NS	NS	NS
	BOD (mg / L)	20	24	NS	NS	NS	<2	10	NS	NS	NS
W2	EC (µS / cm)	1,500	216	274	252	249	180	267	279	195	NS
	Total suspended solids (mg / L)	50	12	<b>101*</b>	44	16	34	32	<b>86*</b>	<b>1060</b>	NS
	pH	6.5 – 8.5	7.0	7.1	7.0	<b>9.1*</b>	7.6	8.1	8.1	8.2	NS
	BOD (mg / L)	20	2	13	<2	4	<2	5	7	6	NS
W3	EC (µS / cm)	1,500	285	324	NS	268	416	596	NS	NS	NS
	Total suspended solids (mg / L)	50	29	10	NS	35	6	<b>90<sup>®</sup></b>	NS	NS	NS
	pH	6.5 – 8.5	7.5	7.4	NS	8.2	7.5	7.6	NS	NS	NS
	BOD (mg / L)	20	2	7	NS	5	<2	5	NS	NS	NS

^Results of single sample taken at W1, W2 and W3 between March 2011 and November 2014, provided by Stoneco

NS – Not sampled due to area being dry

<sup>®</sup>Rain occurring during sampling

\*Water level noted as low with algae present.

N/A – not applicable as sample site is waste water (expect high levels)

\*\*Development Consent DA308/08 Condition S1.11.1

#### **4.1.5 Summary**

There was one exceedance of Total Suspended Solids during the reporting period, however it was noted the water level was low and turbidity high.

#### **4.1.6 Further Actions**

Improvements to the sediment management strategy will be implemented during the next Reporting Period. This will include the Ongoing maintenance including:

- removal of built up sediment within the sediment basin to increase basin capacity;
- construction of additional rock lined drains; and
- grading and construction of further sediment fences.

The strategy may also include the use of rip-rap on slopes and maintenance of sediment channels.

### **4.2 GROUNDWATER**

#### **4.2.1 Background**

The management of groundwater forms part of the Soil and Water Management Plan, in accordance with DA 308/08. This Plan describes the groundwater monitoring procedures in place at Timor Quarry. In addition, a Groundwater Dependant Ecosystem (GDE) Sampling Protocol has been developed and implemented.

Timor Quarry's groundwater monitoring locations are shown on

Figure 1 and include:

- C1 offsite near Isis River;
- C6 at the north-east end of the site; and
- Q13 adjacent to the extraction area.

#### 4.2.2 EIS Predictions

Section 4.3.5 of the EIS states “*Considering the location of the proposed extraction area at the top of a ridge and, based on the available groundwater data and knowledge, it is considered that the extraction area is highly unlikely to intersect significant quantities of groundwater.*”

The EIS states that no groundwater dependant ecosystems have been identified and concludes in that “*no specific groundwater monitoring is considered necessary.*”

#### 4.2.3 Long Term Baseline

Baseline groundwater quality was determined through samples collected from May 2011 to April 2014 and is presented in **Table 7**. Continuous monitoring of groundwater depth, electrical conductivity and temperature commenced in June 2014 at borehole locations C1 and C6.

#### 4.2.4 Monitoring Results

**Table 7** outlines the groundwater monitoring results for all samples collected from April 2015 to October 2018. The table compares the results to the relevant criteria and baseline.

**Table 7**  
**Groundwater Monitoring Results**

Bore	Pollutant	Criteria*	Date of Monitoring									
			Baseline**	Apr 2015	Jun 2015	Oct 2015	Apr 2016	Oct 2016	Apr 2017	Oct 2017	May 2018	Oct 2018
C1	EC (µS / cm)	1,500	537 - 603	573	NS	586	556	560	581	593	584	586
	pH	6.5 - 8.5	7.1 - 7.4	7.4	NS	7.2	7.2	7.2	7.2	7.3	7.3	7.3
	DO (mg / L)	*	5.8 – 13.5	8.1	NS	6.1	6.9	7.8	7.4	9.4	6.5	7.4
	GDE (150 µm)	N/A	None	ST	NS	ST	None	None	CP®	None	None	None
	GDE (50 µm)	N/A	None	ST	NS	ST	None	None	None	None	None	None
C6	EC (µS / cm)	1,500	508 – 1,065	NS	521	618	622	500	622	654	NS	NS
	pH	6.5 - 8.5	7.3 - 7.4	NS	7.2	7.4	NS	7.6	7.2	NS	NS	NS

	DO (mg / L)	*	8.0 - 9.4	NS	8.3	<b>6.8</b>	NS	<b>5.9</b>	7.4	NS	NS	NS
	GDE (150 µm)	N/A	None	NS	ST	ST	None	CP <sup>^</sup>	CP <sup>@</sup>	S <sup>@</sup>	NS	NS
	GDE (50 µm)	N/A	None	NS	ST	ST	None	CP <sup>^</sup>	None	None	NS	NS
Q13	EC (µS / cm)	1,500	NS	NS	NS	NS	NS	NS	503	NS	NS	NS
	pH	6.5 - 8.5	NS	NS	NS	NS	7.1	7.2	7.2	7.2	NS	NS
	DO (mg / L)	*	NS	NS	NS	NS	7.2	8.1	8.9	NS	NS	NS
	GDE (150 µm)	N/A	NS	NS	NS	ST	None	None	None	None	None	None
	GDE (50 µm)	N/A	NS	NS	NS	ST	None	None	None	None	None	None

NS – Not sampled due to bore being dry

N/A - Not Applicable

\* Soil and Water Management Plan- Dissolved Oxygen limit characterised by baseline data

\*\*As provided by Stoneco.

CP<sup>^</sup> Categorising copepods as troglifauna / stygofauna could not be achieved (Umwelt, Email - 13 Dec 2016)

CP<sup>@</sup> Categorising copepods as potential stygofauna of order Cyclopoida (Umwelt, 2714/RV/CPa/290817)

S<sup>@</sup> Categorising stygofauna as Thoracopod (Bathynellidae) (Umwelt, 2714/RV/CPa/19122017)

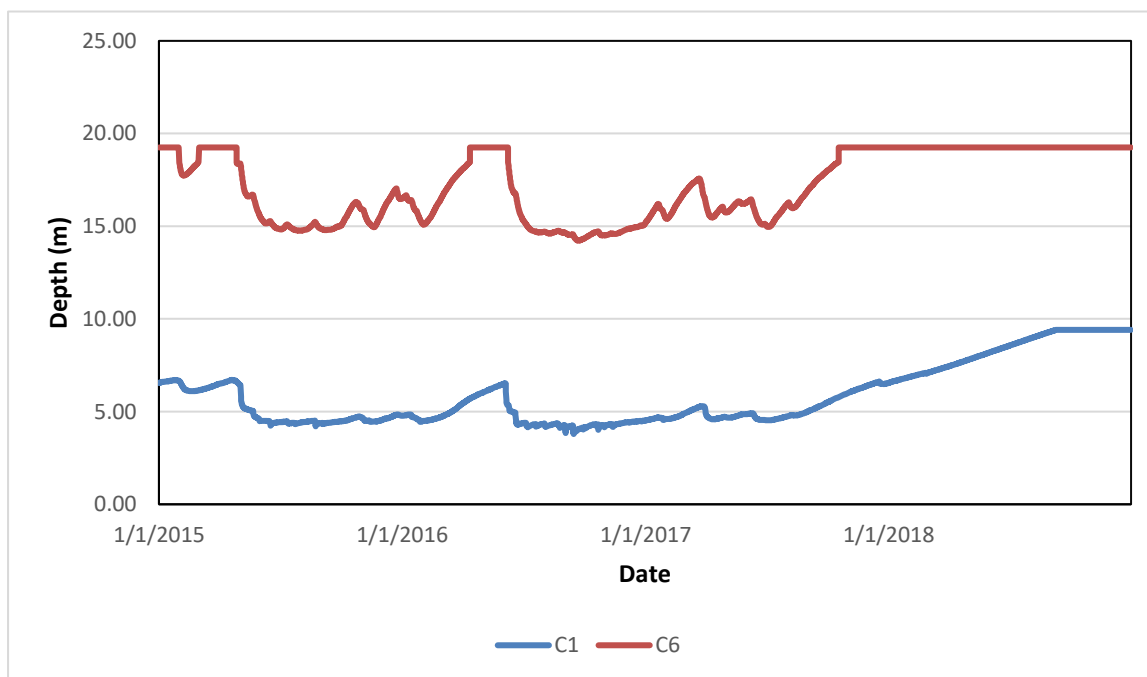
None – Stygofauna / Troglifauna not found

There were no exceedances of the relevant criteria during the 2018 Reporting Period (refer to **Appendix A**). Samples for measuring EC, pH and DO during 2018 were not collected at sampling locations C6 and Q13 due to these boreholes being dry or insufficient in sampling volume.

Groundwater depth at bores C1 and C6, from the commencement of monitoring in January 2015 to December 2018 is presented in **Figure 3**. The figure indicates groundwater depth at C1 fluctuates less than the depth at C6. The result is consistent with the bore's location within the subjacent limestone aquifer, which is connected to the Isis River water table and influenced by a larger watershed upstream.

It is to be noted in **Figure 3** that the constant values of approx. 19m and 9m are due to no reading being recorded over those periods. In the case of C6 this is due to a dry borehole. However, for C1 this is as a result of the sensor failing and requiring repair or replacement.

**Figure 3**  
**Groundwater Depth at C1 and C6**



Groundwater depth at Q13 was measured in May and October at 16.72m and 16.82m respectively. Given the borehole depth is 17.65m; this supports the onsite observation there was insufficient groundwater for sampling.

The findings of the subterranean and GDE sampling are outlined in **Table 8**. Groundwater and leaf litter sampling is provided to a specialist GDE consultant which provides a report on the findings.



**Table 8**  
**Findings of Subterranean and GDE Sampling 2011-2018**

Sampling Date	Sample period	Qualified Expert and Reference	Findings
GDE Baseline	2011-2014	Umwelt (2714b/RV/LH/030115)	GDE not found.
Finding of Subterranean Sampling from Quarry at Timor (30 July 2015)	May / June 2015	Liza Hill Principal Ecologist Umwelt Pty Ltd (2714b/RV/LH/300715)	Groundwater and Leaf litter samples -No stygofauna and troglofauna samples were found in the leaf litter or groundwater samples.
Finding of Subterranean Sampling from Quarry at Timor (29 January 2016)	October 2015	Rebecca Vere Principal Ecologist Umwelt Pty Ltd (2714/RV/KR/290116)	Groundwater and Leaf litter samples - A single stygofauna specimen was found in groundwater at site C6. No stygofauna and troglofauna samples were found in the leaf litter samples.
March 2016	21 March 2016	Rebecca Vere Principal Ecologist Umwelt Pty Ltd Email – 3 January 2017	Groundwater and Leaf litter samples – No stygofauna or troglofauna were identified during the April 2016 monitoring event.
October 2016	26 October 2016	Rebecca Vere Principal Ecologist Umwelt Pty Ltd Email - 13 Dec 2016	Groundwater and Leaf litter samples - Fifteen copepods were recorded at site C6 respectively. These copepods are of recognised stygofauna order.
26 Apr 2017	26 Apr – 23 May 2017	Rebecca Vere Principal Ecologist Umwelt Pty Ltd (2714/RV/CPa/290817)	Groundwater and Leaf litter samples - Three and five copepods were recorded in both sites C1 and C6 respectively. These copepods are of recognised stygofauna order.
20 Sep 2017	20 Sep – 16 Oct 2017	Rebecca Vere Principal Ecologist Umwelt Pty Ltd (2714/RV/CPa/19122017)	Groundwater and Leaf litter samples - A single stygofauna specimen was found in groundwater at site C6. No stygofauna and troglofauna samples were found in the leaf litter samples.
16 Apr 2018	16 Apr – 21 May 2018	Rebecca Vere Principal Ecologist Umwelt Pty Ltd (2714/RV/CPa/11072018)	Groundwater and Leaf litter samples – Two potential stygofauna (Araneae) were identified in groundwater at site Q13. No stygofauna and troglofauna samples were found in the leaf litter samples.
24 Sep 2018	24 Sep – 29 Oct 2018	Rebecca Vere Principal Ecologist Umwelt Pty Ltd (2714/RV/CPa/22052019)	Groundwater and Leaf litter samples – No stygofauna or troglofauna were identified during monitoring event.

#### 4.2.5 Further Actions

Data will continue to be monitored in the next reporting period and any trends identified in monitoring data will be reported.

## 4.3 OPERATIONAL NOISE

### 4.3.1 Background

Noise monitoring was conducted after the Reporting Period on 5<sup>th</sup> February 2018 in accordance with DA 308/08, Condition U1.1, states “A noise compliance assessment shall be undertaken within three months of commencement of operational activities “. A noise compliance report has been completed By Bridge Acoustics See attached report in Appendix C.

EPL 13397 Condition L6.1 specifies a noise limit of 35 LAeq,15min at Residence R2 (see **Figure 1**) ‘Caves Ridge’ during the day, from 7 am to 6 pm. The LAeq,15min is the acoustic average noise level from quarry sources, excluding noise from other non-quarry sources. No measurements were taken at the McIntyre residence as this is understood to be subject to acquisition by Stoneco upon request from the owner and was therefore excluded from the noise survey.

### 4.3.2 EIS Predictions

Section 4.8.5.2 of the EIS presents the results of the noise assessment. The EIS predicts noise levels at all surrounding residences would be below the relevant noise criteria except at the closest residence (R1) during normal operations with a light northwest wind.

**Table 9** outlines EIS calculations for the modelled operational scenarios (Years 1 and 25) at R2, including the most significant noise sources contributing to the received noise.

**Table 9**  
**EIS Predictions for Noise at Residence R2**

Scenario	Total Noise dB(A)Leq(15min)
Year 1 NW wind	<35
Year 25 NW wind	<35

Source - EIS Table 4.25

The EIS notes that as the quarry will not reach maximum production for several years, truck movements in the initial years of operation, would be well below those provided for within the assessment.

### 4.3.3 Monitoring Results

**Appendix C** presents the results of the 2018 noise survey. Results give an average quarry noise contribution of 27 LAeq,15min, averaged over 14 minutes 44 seconds excluding the period of dominant wind noise, has been determined from the measurement results. The results were below the maximum criteria of 35 LAeq,15min.

#### **4.3.4 Summary**

Results described in this assessment, based on noise measurements taken on 5 February 2018, indicate the Timor Quarry noise contribution was well below the EPL noise limit of 35 LAeq,15min at the residence and is therefore considered acceptable.

#### **4.3.5 Further Actions**

Stoneco has advised current strategies will be maintained for the next reporting period and will continue to be reviewed following monitoring.

### **4.4 DUST**

#### **4.4.1 Background**

Air quality management at Timor Quarry is undertaken in accordance with the requirements of the Air Quality Management Plan. This document provides impact criteria and monitoring methods required to determine deposited dust at the locations shown on

Figure 1:

- Residence One (R1) (McIntyre); and
- Residence Two (R2) (Vaughan).

The requirement to measure air quality concentrations of particulate matter less than 10 microns (PM<sub>10</sub>) (DA 308/08 Condition S1.18.2) is required *“when the activity reaches the lesser of an annual throughput of 30,000 tonnes of product per annum or 1,100 truckloads of product per annum”*. This requirement has not been triggered in the Reporting Period.

#### 4.4.2 EIS Predictions

Section 4.2 of the Air Quality Assessment undertaken for the EIS, notes that depositional dust monitoring data is not available for the Project Site or the surrounding area. The Report states *“As it is not appropriate to assume negligible levels of dust deposition due to surrounding agricultural operations, dust deposition associated with the Project Site will be assessed based on the incremental guideline of 2g/m<sup>2</sup>/month.”*

Predicted increases in dust deposition at residences is outlined in Section 4.7.6.3 of the EIS. The results show the predicted average monthly dust deposition as a result of the proposed operations over a one year time frame. Predictions for Project years one and 25, relevant to Q1, R1 and R2 are reproduced in Error! Reference source not found.. The table indicates that the incremental dust deposition rates for the operational scenarios are predicted to be well below the incremental goal of 2g/m<sup>2</sup>/month at both residences.

**Table 10**  
**EIS Predictions for Dust Deposition**

Residence	Dust Deposition – Annual Average (g / m <sup>2</sup> /month)	
	Result	Incremental Goal
Scenario 1 – Year 1		
Onsite (Q1)	na	2
Residence 1 (R1)	0.2	2
Residence 2 (R2)	0.1	2
Scenario 2 – Year 25		
Onsite (Q1)	na	2
Residence 1 (R1)	0.4	2
Residence 2 (R2)	0.1	2

Source – Modified from EIS, Table 4.21  
 na – not applicable

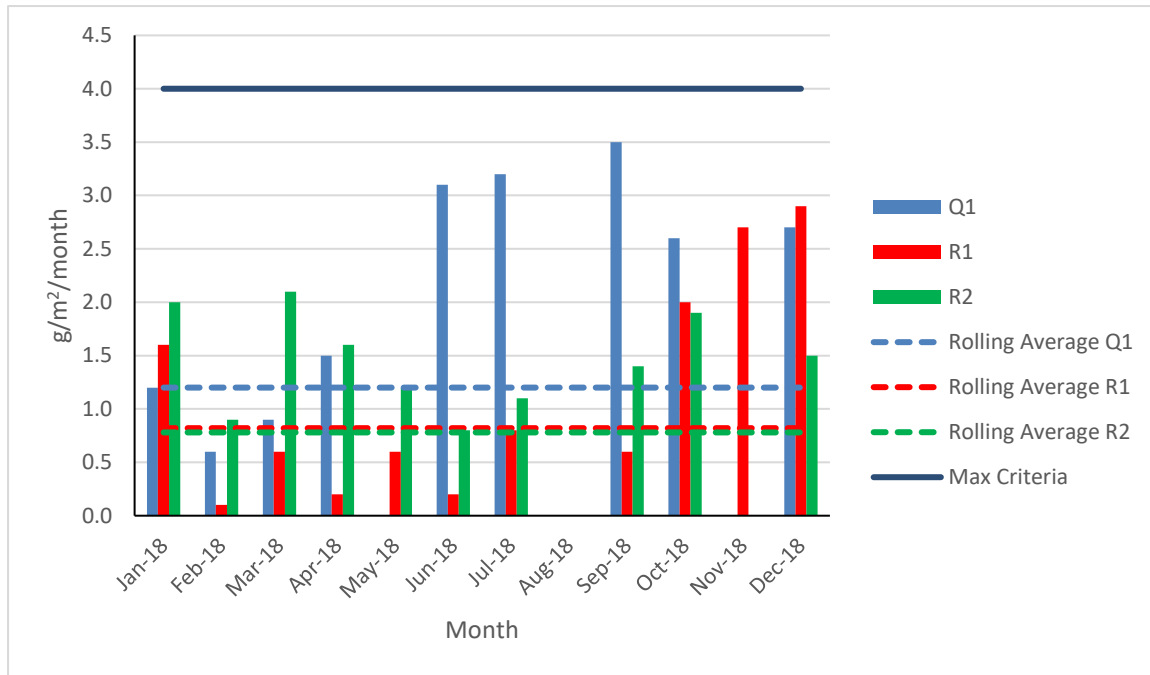
#### 4.4.3 Long Term Baseline

Baseline values for monitoring conducted between November 2011 and May 2014 was provided by Stoneco and is presented in **Table 11**.

#### 4.4.4 Monitoring Results

**Figure 4** presents the results of the depositional dust monitoring for 2018, together with the rolling averages from 2015-2018. **Table 11** compares the 2018 averages against relevant criteria, the rolling average and the baseline.

**Figure 4**  
**Depositional Dust Monitoring**



**Table 11**  
**Comparison of Dust Monitoring Results to Relevant Criteria**

Receptor Location	Maximum Increase in Deposited dust level (g / m <sup>2</sup> / month)	Maximum Criteria* (g / m <sup>2</sup> / month)	Baseline Average** (g / m <sup>2</sup> / month) (Nov 11 – May 14)**	Rolling Average (Jan 15 – Dec 18)	2016 Annual Average (g / m <sup>2</sup> / month)	2017 Annual Average (g / m <sup>2</sup> / month)	2018 Annual Average (g / m <sup>2</sup> / month)
Q1	2.0	4.0	1.2	1.2	1.3 <sup>@</sup>	0.8	1.9 <sup>^</sup>
R1	2.0	4.0	1.1	0.8	0.8	0.6	1.1 <sup>*</sup>
R2	2.0	4.0	0.4	0.8	0.5	0.9 <sup>#</sup>	1.5 <sup>^</sup>

\* Development Consent DA308/08 Condition S1.19

\*\*Provided by Stoneco Pty Ltd

<sup>@</sup>Excludes three months of results due to bird dropping contamination

<sup>#</sup>Excludes Nov 2017 result due to bird dropping contamination

<sup>^</sup>Excludes two months of results due to bird dropping contamination Nov 2018 and Dust storm Aug 2018

<sup>^</sup>Excludes Aug 2018 result due to Dust storm

Results for 2018 show that in August, the depositional dust was greatly above (4.4-4.9 g / m<sup>2</sup> / month) the maximum criteria of 4 g / m<sup>2</sup> / month at all sampling sites. It was observed, however, during this sampling period a dust storm occurred on 31 August 2018. Similarly, in Nov 2018, it was observed samples Q1 and R2 contained bird droppings, contaminating the sample and giving rise to high readings (4.3-16.1 g / m<sup>2</sup> / month). Hence, these results can be ignored. All other results were both below the maximum increase in deposited dust level of 2 g / m<sup>2</sup> / month and the maximum criteria of 4 g / m<sup>2</sup> / month.

Analytical results of the 2018 depositional dust results is presented in **Appendix A**.

#### **4.4.5 Summary**

Depositional dust averages for 2018 were higher than the baseline and the rolling average all sampling sites, which is expected due to increased production levels and drought conditions. However, depositional dust averages for 2018 remain well below the maximum increase and maximum criteria levels.

#### **4.4.6 Further Actions**

Stoneco has advised current strategies will be maintained for the next reporting period and will continue to be reviewed following monitoring. Bird rings were adjusted and raised in December 2018 above the top of the deposited dust collection unit to prevent bird dropping contamination and the sediment catchment dam within the plant area was de-silted and the wall has been raised and armour rocked.

### **4.5 BLAST**

#### **4.5.1 Background**

Stoneco has developed and implemented a Blast Management Protocol which describes statutory requirements related to blast vibration and overpressure and measures to ensure that blast events are effectively monitored and managed.

Monitoring of blast characteristics is undertaken at two blast sites (see

Figure 1), referred to as follows:

- R1 (McIntyre); and
- R2 (Vaughan).

The following data is recorded at each blast event:

- Blast location and name;
- Time and date;
- Weather conditions;
- Peak vector sum (mm/s); and
- Air overpressure peak (dB Linear Peak).

#### **4.5.2 EIS Predictions**

Section 5.4.4 of the EIS Noise and Vibration Assessment, describes the nearest residences approximately 600 m to the north east (R1) and 800 m to the east (R2) of the Timor Quarry. Predicted blast noise and vibration levels at distances relevant to R1 and R2 are reproduced in **Table 12**.



**Table 12**  
**Predicted Blast Noise and Vibration Levels**

Distance	Peak Particle Velocity (mm / sec)	Overpressure dB (Linear)
500 m	0.95	114
750 m	0.5	110
1,000 m	0.16	103

Source: Adapted from Table 7 Noise and Vibration Assessment, EIS

### 4.5.3 Monitoring Results

There was one blast event during the Reporting Period, located in the south eastern corner of the quarry extraction area and placing it within the closest distance to R1 and R2.

**Table 13** outlines the results of blast monitoring against the relevant criteria. The 2018 blasting was compliant with the relevant criteria for blasting.

**Table 13**  
**Blast Monitoring**

Blast Reference ID	Blasting Results at Residential Receptors	Maximum Criteria*	Time / Date 2018	R1 Result**	R1 Predicted	R2 Result**	R2 Predicted
V901	Blast Overpressure dBA	115 dBA	15 September	No trigger	114 dBA	No trigger	110 dBA (lin peak)
	Ground Vibration (mm/sec)	5 mm / sec		No trigger	1.0mm/sec	No trigger	0.5mm/sec

\*Schedule 2 S1.4 Development Consent DA308/08

\*\*Provided by Stoneco

### 4.5.4 Summary

There were no exceedances of the relevant blast criteria during the Reporting Period and to date there have been no exceedances of blast criteria at Timor Quarry.

### 4.5.5 Further Actions

Stoneco has advised current strategies will be maintained for the next reporting period and will continue to be reviewed following blast events and monitoring.

## **4.6 ECOLOGY**

### **4.6.1 Background**

Stoneco has developed a Biodiversity Management Plan prepared in accordance with DA 308/08, Conditions S5.2(c) and S5.5, to ensure that biodiversity is effectively monitored and managed.

DA 308/08, Condition S1.21.9 states *“An annual inspection is to be made by persons whose qualifications and/or experience to undertake such inspections, have been approved by Council, during each of the first five (5) years of operation of the quarry of the nesting boxes placed on the Project Site, and also of the health of the planted White Box, Yellow Box and Bundy seedlings. The inspection report must include a review of the condition and use of the nesting boxes. Any planted White Box, Yellow Box and Bundy trees that are found to have died are to be replaced, with any actions taken to help ensure that the new plantings have a better chance of becoming established.”*

DA 308/08, Condition S5.5 (vii) states *“Monitoring of the progress of the implementation of the Biodiversity Management Plan is to be undertaken and reported in the Annual Environmental Management Report.....Photographs from fixed and permanent reference points (include baseline / pre-treatment photographs) are to be established.”*

### **4.6.2 EIS Predictions**

Section 4.4.6 of the Flora Assessment undertaken for the EIS assessed that the proposal *“would maintain or improve biodiversity outcomes, and in particular, would not reduce the long-term viability of a local population of the any flora species, population or ecological community, accelerate the extinction of the any flora species, population or ecological community or place it at risk of extinction, or adversely affect critical habitat. The assessment noted that “Given the implementation of the proposed mitigation measures, it is assessed that there would not be a significant impact on threatened species, populations or communities... and that the proposal would meet the ‘maintain or improve’ principle.*

Section 4.4.6 of the Fauna Assessment undertaken for the EIS concluded *“With the implementation of the proposed safeguards and mitigation measures, it is considered that the degree of the impact of the proposal is unlikely to have an adverse effect on the life cycle of any threatened fauna species known or likely to occur within the Study Area to the extent that a viable local population of the species is likely to be placed at risk of extinction.”*

### **4.6.3 Monitoring Results**

No inspection of Nesting boxes was conducted by Hunter Land Management. The four bird boxes were located on the north side of the dam.

#### **4.6.4 Further Actions**

Details on the implementation of the Biodiversity Management Plan, including photographs taken from permanent reference points will be included in the 2018 AEMR.

Arrangements have been made for HLM to visit site and conduct inspections and weed spraying in 2019.

## 5 COMPLAINTS AND COMMUNITY LIAISON

An Online Complaints line was set up in April 2018. No complaints were received during reporting period.

Liaison with the community continued throughout 2018 via meetings with the Community Consultative Committee (CCC). Representatives on the CCC include two representatives from the community, two representatives from Stoneco Pty Ltd and another from UHSC. Minutes are taken by UHSC as records of the meetings. Meetings were held with the CCC in February 2018 and August 2018.

## 6 ENVIRONMENTAL IMPROVEMENTS

During the 2018 Reporting Period, Stoneco implemented an Environmental Operations Report (EOR) which details the results of on-site inspections and suggests actions to control or reduce environmental risks. The EOR also details consent requirements and action required to ensure compliance with DA308/08 consent conditions in house.

A copy of the Environmental Operations Reports, completed during the Reporting Period is included in Appendix B. Key actions from the Reports and their status are included in Table 14. This table also outlines actions required by Stoneco carried over from the previous AEMR.

**Table 15  
Actions Required**

Source / DA Condition	Action Required	Status at February 2019
<b>2018 Reporting Period</b>		
	Noise assessment	Bridges acoustics completed
S5.5 (vii)	Implementing the BMP, including photographs from fixed and permanent reference points	Under review
1.12.14	Provide a statement from an appropriately qualified hydrologist for inclusion in the AEMR as evidence that ground waters are not being adversely impacted by quarry construction or operation	Instructed Mr S Swabey Underway
<b>2017 Reporting Period</b>		
1.12.14	Provide a statement from an appropriately qualified hydrologist for inclusion in the AEMR as evidence that ground waters are not being adversely impacted by quarry construction or operation	To be provided as an addendum to the AEMR once completed Mr S Swabey
1.21.9	Re-establish annual inspection of nesting boxes in 2018	To be done in 2018-19
S5.5 (vii)	Implementing the BMP, including photographs from fixed and permanent reference points	To be done in 2018-19
<b>2016 Reporting Period</b>		
EIS	Oil and Grease to added to testing parameters for surface water (or confirm why not required)	Not required as none kept onsite
Soil and Water MP	Increase number of surface water samples taken annually by undertaking opportunistic samples (when possible) following rainfall (or confirm why not required)	As catchment is ephemeral in nature, no more sampling locations are required.
<b>2015 Reporting Period</b>		
U1.1	Conduct a noise compliance assessment	C (see section 4.3)
S6.2 (ii) and S3.28	Provide all monitoring results from previous years (Monitoring and sampling data from all previous years must be set out in a cumulative monitoring and sampling table for each subsequent AEMR for the life of the development)	C
1.12.14	Provide a statement from an appropriately qualified hydrologist for inclusion in the AEMR as evidence that ground waters are not being adversely impacted by quarry construction or operation	To be provided as an addendum to the AEMR once completed Mr S Swabey
1.21.9	Annual inspection of nesting boxes	C
S5.5 (vii)	Details on the implementation of the BMP, including photographs from fixed and permanent reference points	NC (to be included in 2019 AEMR)

NC – Not yet completed  
C- Completed

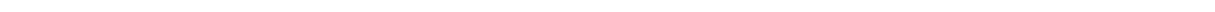
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**APPENDIX A**  
***Monitoring Data***

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## **APPENDIX B**

### ***Environmental Operations Reports***





## **APPENDIX C**

### ***Noise Compliance Survey***

