# 2022-2023 WAGGA WAGGA QUARRY ANNUAL REVIEW

## Wagga Wagga Quarry

### ANNUAL REVIEW

Table 0.1: Document Control

| Document Title | Environmental Management Annual Review – Wagga Wagga Quarry | | | |
|---|---|---|---|---|
| Document Number | WWQAR22-23 | | | |
| Document Owner | Hanson Construction Materials Pty Ltd | | | |
| | **Issue Date** | **Originator** | **Reviewed** | **Approved** |
| **Draft** | 3.10.2023 | Belinda Pignone | | Belinda Pignone |
| **Final** | | | | |
| **Resubmission** | | | | |

Table 0.2: Annual Review title block

| | |
|---|---|
| **Name of operation** | **Wagga Wagga Quarry** |
| **Name of operator** | Hanson Construction Materials Pty Ltd |
| **Development consent/project approval #** | MP 07_0069 |
| **Name of holder of development consent/project approval** | Hanson Construction Materials Pty Ltd |
| **Water licence #** | 40BL190719 and 40BL190720 for groundwater extraction of 360 ML/year; and WAL37001 (and the associated Water Supply Works Approvals) entitled the quarry to pump 100 ML/year from the Murrumbidgee River. |
| **Name of holder of water licence** | Hanson Construction Materials Pty Ltd |
| **Annual Review start date** | 1 July 2022 |
| **Annual Review end date** | 30 June 2023 |

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Table 0.3: List of Abbreviations

| | |
|---|---|
| **DPE** | **NSW Department of Planning and Environment.** |
| **DPE Water** | Division of Water within the NSW Department of Planning and Environment. |
| **DRE** | Division of Resources & Energy within the NSW Department of Industry. |
| **EPA** | Environment Protection Authority. |
| **RMP** | Rehabilitation Management Plan or equivalent plan required under the conditions of a relevant approval |
| **WAL** | Water Access Licence |
| **DDG** | Deposited Dust Gauge |
| **Relevant approval** | Includes the following approvals where they are material to the conduct of the operation: a development consent, project approval, mining lease or water access licence. |
| **Reporting period** | Financial year, unless specified otherwise in the relevant conditions of approval or agreed in writing with DPE and DRE. |

# 1. STATEMENT OF COMPLIANCE

Table 1.1: Statement of compliance

| Were all conditions of the relevant approval(s) complied with? | |
|---|---|
| MP 07_0069 | ~~YES~~/NO |

Table 1.2: Non-compliances

| Relevant approval | Condition # | Condition description (summary) | Compliance status | Comment | Where addressed in Annual Review |
|---|---|---|---|---|---|
| MP 07_0069 | 15 | Water Monitoring Program | Non-compliant | Groundwater logger download have not been completed in the 2023 period due to accessibility issues resulting from the November 2022 flooding event. | 6.6.6 |
| MP 07_0069 | 15 | Water Monitoring Program | Non-compliant | A v-notch weir is required to complete the water volume monitoring requirements for the water recycling program (water volume from processing plant back into water storage) . This is currently not installed at the site. This results in an overestimation of water volume take. | 6.6.6 |

Table 1.3: Compliance status key for Table 1.2

| Risk level | Colour code | Description |
|---|---|---|
| High | Non-compliant | Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence. |
| Medium | Non-compliant | Non-compliance with:<br>• potential for serious environmental consequences, but is unlikely to occur; or<br>• potential for moderate environmental consequences, but is likely to occur |
| Low | Non-compliant | Non-compliance with:<br>• potential for moderate environmental consequences, but is unlikely to occur; or<br>• potential for low environmental consequences, but is likely to occur |
| | Administrative non-compliance | 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 conditions) |

# 2. INTRODUCTION

## 2.1. SCOPE AND FORMAT

This *Annual Review* has been prepared for the Wagga Wagga Quarry (the Quarry) in accordance with the requirements of *Condition 3(5)* of *Project Approval MP 07_0069 (MP 07_0069)*. The Quarry is owned and operated by Hanson Construction Materials Pty Ltd (Hanson) and located on the floodplain of the Murrumbidgee River five kilometres (km) west of the city of Wagga Wagga, in the Riverina region of NSW, approximately 460km southwest of Sydney (refer to **Figure 1**). This report documents the works undertaken and environmental performance from 1 July 2022 to 31 June 2023 (the reporting period).

*MP 07_0069* was granted by the Minister for Planning and Environment (formally Minister for Planning and Infrastructure) on 22 November 2011 and was modified to permit a slight increase of transport movements in the afternoon period in October 2018. A copy of MP *07_0069* is reproducted as **Appendix 1**. *Condition 3(5)* is reproduced below:

> *"By the end of June 2012, and annually thereafter, the Proponent must review the environmental performance of the project to the satisfaction of the Secre tary. This review must:*
>
> *a) describe the development (including any rehabilitation) that was carried out in the past year, and the development that is proposed to be carried out over the next year;*
>
> *b) include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the:*
>
> - *relevant statutory requirements, limits or performance measures/criteria;*
> - *monitoring results of previous years; and*
> - *relevant predictions in the documents referred to in condition 2 of Schedule 2;*
>
> *c) identify any non-compliance over the past year, and describe what actions were (or are being) taken to ensure compliance;*
>
> *d) identify any trends in the monitoring data over the life of the project;*
>
> *e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and*
>
> *f) describe what measure will be implemented over the next year to improve the environmental performance of the project.*

The information presented within this *Annual Review* has been prepared based on information compiled by Hanson.

## 2.2. THE COMPANY

Hanson Construction Materials Pty Ltd operates over 50 quarries in Australia and supplies aggregates, sand, and premixed concrete materials for the construction industry. The Company also produces precast concrete. The Company is a subsidiary company of Heidelberg Cement which internationally employs approximately 60 000 people at more than 3 000 locations in around 60 countries.

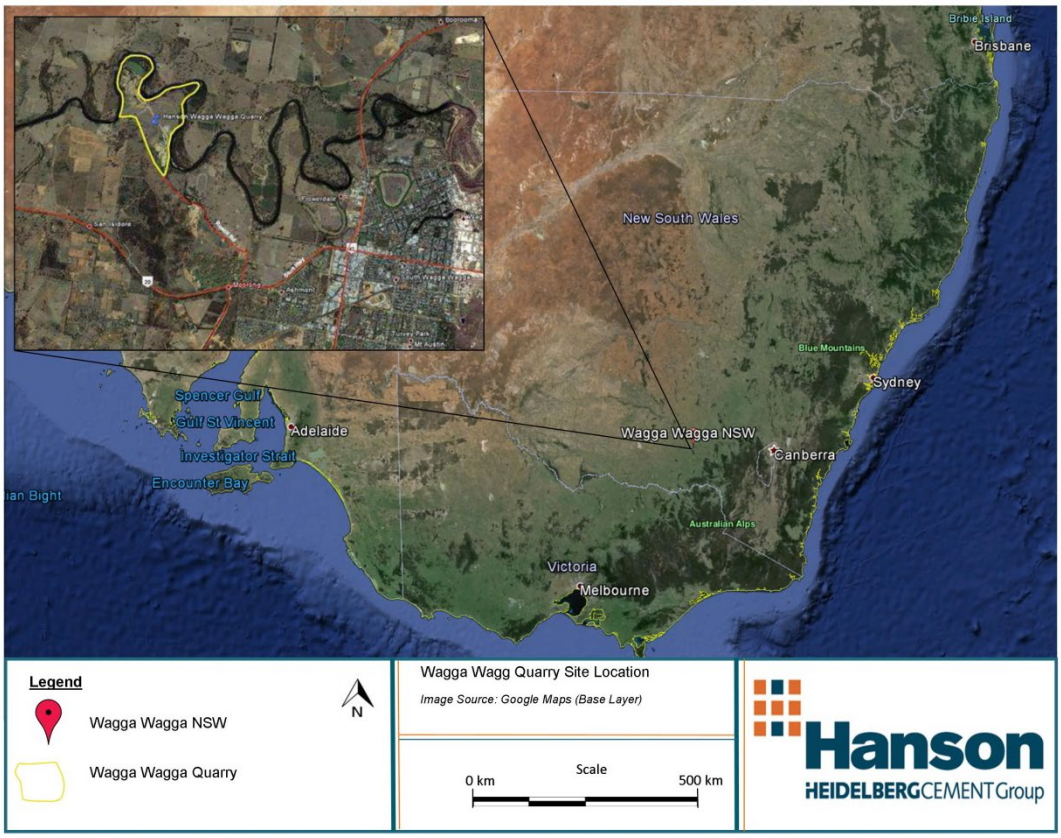


Figure 1: Site location

## 2.3. OVERVIEW OF OPERATIONS

### 2.3.1. Approved Activities

The approved activities at the Quarry comprise the following:

- Development and use of an extraction area to extract sand and gravel using standard rip and tear, washing, load and haul techniques.
- Use of a wash plant to process extracted sand and gravel to produce a range of quarry products, and stockpiling of the resulting products within an identified infrastructure area.
- Use of a site access road and interaction with Roach Road.
- Transportation of up to 150,000t per year of quarry products via Roach Road using truck and dog trucks.
- Establishment of native vegetation to provide visual screening for quarry operations.

### 2.3.2. Hours of Operation

The approved hours of operation are as follows:

- Monday to Friday – 6 am to 6 pm
- Saturdays – 8 am to 1 pm
- Sundays and Public Holidays – no activities

All activities during the reporting period were undertaken within the approved hours of operation.

### 2.3.3. Employment

During the reporting period, employment at the Quarry remained at three operational staff, one truck driver, one casual plant operator and the quarry manager. Employment is expected to remain consistent with this level during the next reporting period.

## 2.4. KEY PERSONNEL CONTACT DETAILS

The key personnel contact names, position and phone numbers are as follows.

**Table 2.1: Key personnel contact details**

| Name | Position | Contact details |
|---|---|---|
| **Gemma Vote** | Quarry Manager | Gemma.vote@hanson.com.au<br>0429 940 172 |
| **Belinda Pignone** | Senior Environmental Coordinator | Belinda.pignone@hanson.com.au |

## 2.5. MANAGEMENT OF DOCUMENT PREPARATION

This document has been prepared by Ms. Belinda Pignone (B.Env.Mgt.Sc.) with assistance from Ms Gemma Vote, Quarry Manager. Hanson provided technical input and information on Quarry operations and environmental performance during the reporting period.


Figure 2: General Project Layout


**Figure 3: Site Map and Nearest Receivers**

# 3. APPROVALS

Table 3.1 presents the approvals and licences held in relation to the Quarry.

**Table 3.1: Approvals and Licence**

| Consent/Lease/Licence | Issue Date | Expiry Date | Details/Comments |
|---|---|---|---|
| **Project Approval 07_0069** | 22/11/2011<br>Modified 30/10/2018 | 31 December 2036 | Issued by the Department of Planning and Environment |
| **Environmental Protection Licence EPL 2433** | 17/01/2000<br>Variation 03/08/2001<br>Variation 06/09/2001<br>Variation 21/06/2004<br>Variation 11/06/2008<br>Variation 07/03/2014<br>Variation 30/11/2015<br>Variation 04/08/2020 | - | Issued by the Environment Protection Authority |
| **Groundwater Access Licence 33474**<br><br>**Temp. water licence allocation TW34028** | | - | Issued by the Department of Primary Industries – Office of Water<br>Share component 360ML<br><br>Share component 25ML |
| **Surface Water Access Licence 37001** | | - | Issued by the Department of Primary Industries – Office of Water<br>Share component 95ML |

Project MP 07_0069 was approved under Section 75J of the *Environmental Planning and Assessment Act 1979* (EP&A Act). On 30 October 2018, Hanson received approval for a modification (MOD1) to MP 07_0069 to permit an increase from three dispatches to six dispatches between the weekday hours of 3 pm to 5 pm.

All management plans are regularly reviewed in accordance with *Condition 4 of Schedule 5 of MP 07_0069*. Management Plans will be reviewed in the third quarter of 2023.

# 4. OPERATIONS SUMMARY

## 4.1. INTRODUCTION

**Figure 2** presents an overview of the Quarry layout at the end of the current reporting period.

## 4.2. EXTRACTION OPERATIONS

Wagga Wagga Quarry has continued extraction of sand and gravel from Cell 1/Stage 1 of the quarry by either a front-end loader or excavator and hauled to the processing plant where it is sorted into sellable products. Overburden stripped for preparation and accessibility to Cell 2 extraction activities was stockpiled for future use in rehabilitation and any amenity bunds within the property boundary.

The operational production performance of the Wagga Wagga quarry is shown in **Table 4.1**. The quarry continues to operate well within its allowable limit under the development consent.

**Table 4.1: Production summary**

| Material (specify source) | Approved limit | Previous reporting period (actual) | This reporting period (actual) | Next reporting period (forecast) |
|---|---|---|---|---|
| **Sand & gravel** | 150,000 tonnes/year | 100,000 tonnes | 90,000 tonnes | 20,000 tonnes |

## 4.3. OTHER OPERATIONS

During the reporting period, progressive construction of Cell 2 continued, principally in relation to cell wall construction with limited extraction. Processing operations required the use of the fixed wash plant during the reporting period. Post flooding, Cell 1 backfilling commenced.

Product transported off-site during the reporting period was approximately 90,000 tonnes of material, which is below the approved annual transportation volume of 150,000 tonnes.

There have been no infrastructure upgrades over the 2022-2023 reporting period. There have been no upgrades to the fleet over the 2022-2023 reporting period.

Processing works were halted after the November 2022 major flooding event. 2023 works has been dedicated to dewatering areas in the quarry impacted by the flood, including Cell 1 and Cell 2, the reestablishment of the Cell 1 / Cell 2 shared wall and maintence of cell walls.

## 4.4. NEXT REPORTING PERIOD

Extraction operations will cease in the next reporting period as the site goes into care & maintenance. Monitoring and rehabilitation works will continue as required under the relevant management plans. Backfilling of Cell 1 will continue with rehabilitation works being a priority.

There will be limited to no transport movements occurring in the next reporting period.

# 5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

Correspondence from the Department of Planning and Environment regarding the Annual Review 2021-2022 was provided on 17 October 2022. It is noted that the Department had reviewed the Annual Review and considered it to satisfy the reporting requirements of the Consent. Additionally, it was noted that the self-reported non-compliances was reviewed and determined to record the non-compliances with no further enforcement action. It was also reminded that the Annual Review is required to be submitted to the Department by 30 August each year. Please note that the 30 August date does not allow the three month period that is applied for consents that have a stipulated due date of the Annual Review. As such, it's expected that the annual review will be due 30 September.

# 6. ENVIRONMENTAL PERFORMANCE

## 6.1. INTRODUCTION

Environmental monitoring is undertaken to determine the degree of impact the construction and production operations are having on the environment. Assessment of these results can establish if environmental management systems are being successfully applied in the short term and if the management systems need to be amended. Appropriate environmental monitoring, apart from satisfying necessary statutory requirements, demonstrates to the local community and relevant authorities the Company's commitment to the protection of the environment.

The following sub-sections present the results of the various monitoring programs undertaken throughout the reporting period. Where appropriate, previous years' monitoring results are also presented for comparative purposes.

**Figure 3** and **Figure 4** provide monitoring locations and residences referred to in this section.

## 6.2. METEOROLOGICAL MONITORING

**Table 6.1** presents the meteorological monitoring and long term-average climate data from the Bureau of Meteorology-operated Wagga Wagga AWS (Station No 74127). Total rainfall during 2022-2023 period was significantly higher than that in 2021-2022, however individual months varied. When compared with the long-term average recorded at the Wagga Wagga AWS, there is significant variance across the year.

Wind rose data (9:00am and 3:00pm) recorded at the Wagga Wagga meteorological station (Station No. 74127) is provided in **Figure 5**.

**Table 6.1: Historical Meteorological Monitoring**

| Year | | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Ann |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | |
| **18-19** | Max | | | | | | | | | | | | | |
| | Min | | | | | | | | | | | | | |
| **19-20** | Max | | | | | | | | | | | | | |
| | Min | | | | | | | | | | | | | |
| **20-21** | Max | | | | | | | | | | | | | |
| | Min | | | | | | | | | | | | | |
| **21-22** | Max | | | | | | | | | | | | | |
| | Min | | | | | | | | | | | | | |
| **22-23** | Max | | 19.9 | 21.8 | 25.4 | 28.0 | 36.2 | 38.1 | 37.6 | 39.9 | 26.7 | 20.2 | 21.6 | 28.7 |
| | Min | | -1.5 | 0.3 | 2.5 | 4.5 | 4.1 | 10.8 | 7.8 | 5.4 | 3.1 | -2.2 | -1.9 | 3.0 |
| **Long Term Av** | Max | | | | | | | | | | | | | |
| | Min | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| **18-19** | Total | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. Rain Days | | | | | | | | | | | | | |
| | Max Daily Rainfall | | | | | | | | | | | | | |
| **19-20** | Total | | | | | | | | | | | | | |
| | No. Rain Days | | | | | | | | | | | | | |
| | Max Daily Rainfall | | | | | | | | | | | | | |
| **20-21** | Total | | | | | | | | | | | | | |
| | No. Rain Days | | | | | | | | | | | | | |
| | Max Daily Rainfall | | | | | | | | | | | | | |
| **21-22** | Total | | | | | | | 77.4 | 78.2 | 111.2 | 2.4 | 32.2 | 74.2 | |
| | No. Rain Days | | | | | | | 5 | 5 | 8 | 2 | 6 | 10 | |
| | Max Daily Rainfall | | | | | | | 39.6 | 60.4 | 32.6 | 2.0 | 14.4 | 30.2 | |
| **22-23** | Total | | 79.0 | 73.6 | 145.8 | 87.0 | 47.4 | 104.4 | 19.0 | 108.0 | 61.8 | 25.8 | 49.4 | 801.2 |
| | No. Rain Days | | 23 | 16 | 20 | 9 | 7 | 12 | 7 | 9 | 8 | 11 | 17 | 139 |
| | Max Daily Rainfall | | 18.0 | 19.2 | 28.4 | 45.2 | 16.0 | 27.2 | 16.6 | 32.4 | 20.4 | 25.8 | 12.8 | 23.8 |

## 6.3. NOISE

### 6.3.1. Predicted Impacts and Performance Criteria

*Condition 1* of *Schedule 3* of the *MP 07_0069* stipulates environmental performance conditions for the monitoring and management of noise for the Quarry. The Project Approval specifies; operating hours (**Table 6.2**), noise limit criteria (**Table 6.3**), operating conditions and the preparation of a Noise Management Plan. The locations of the nearest sensitive receivers and the corresponding monitoring locations are shown in **Figure 4**.

**Table 5.3** identifies the predicted operating noise levels at two representative residences surrounding the Quarry (**Figure 4**). The EIS concluded that noise levels were predicted to be below the noise limit criterion at all surrounding sensitive receivers.

**Table 6.2: Noise Impact Assessment Criteria (dB(A) LAeq(15min)**

| Location | Day |
|---|---|
| **Kulleroo 2** | 39 |
| **Riverglen** | 40 |
| **All other privately owned land** | 36 |

**Table 6.3: Approved Operating Hours**

| Activity | Day | Time |
|---|---|---|
| **All quarrying operations** | Monday – Friday (except Public Holidays) | 6am – 6pm |

| | | |
|---|---|---|
| | Saturdays | 8am – 1pm |
| | Sundays and Public Holidays | No activities |
| **Transportation off-site** | Monday – Friday (except Public Holidays) | 6am – 6pm |
| | Saturdays | 8am – 1pm |
| | Sundays and Public Holidays | No activities |

The Proponent managed noise compliance through the project's Noise Management Plan and the Project Approval conditions of consent. Noise monitoring is to occur on the commencement of a new cell. As the Project has not progressed to the next development stage, no noise monitoring has occurred in the 2022-2023 reporting period. There has been no noise complaints during the reporting period.

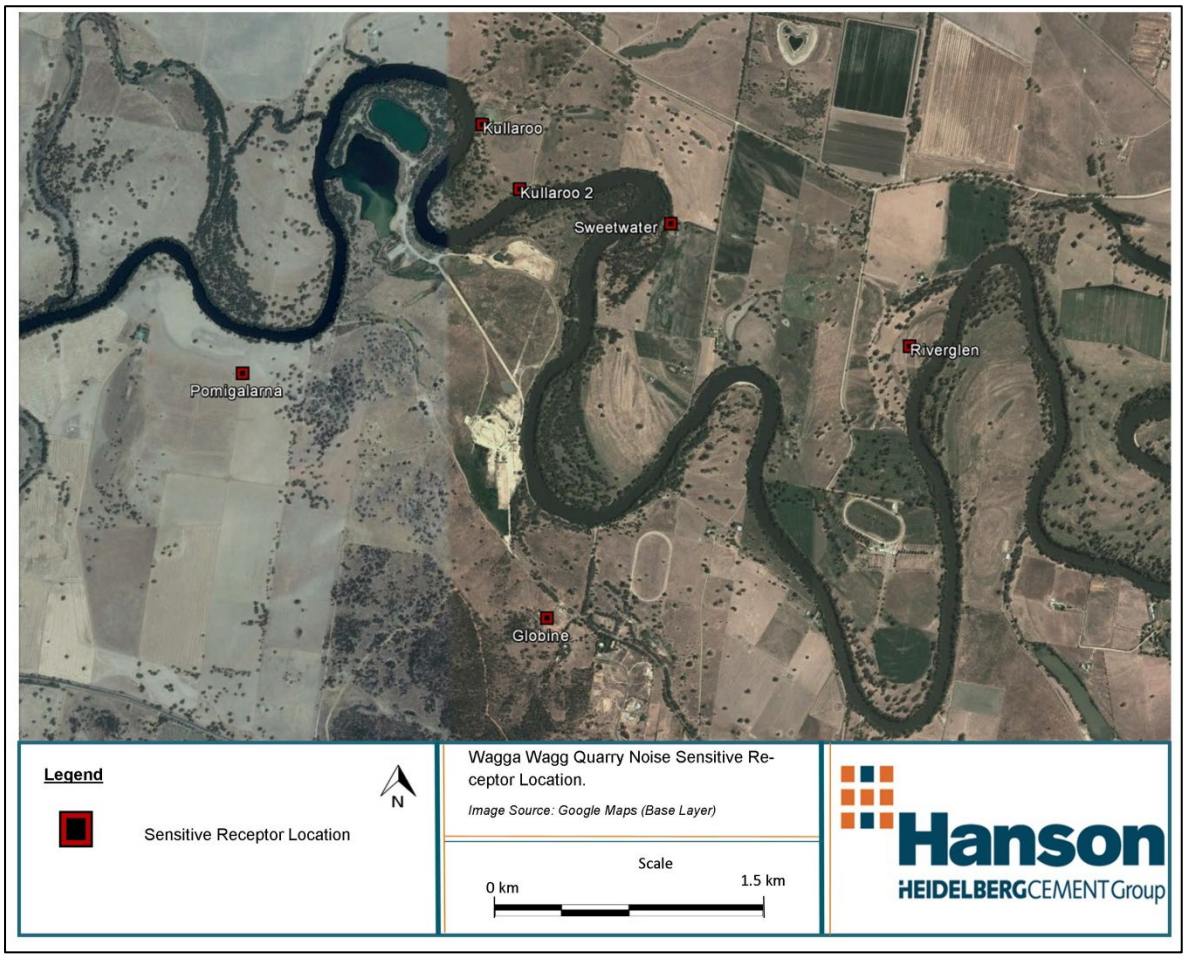


Figure 4: Noise and Air Sensitive Receptors

### 6.3.2. Measured Performance

No noise monitoring was required to be undertaken during the monitoring period. Previous measured noise levels at all monitoring locations continue to be at or immediately below the predicted noise levels in the 2011 EIS for the attended monitoring assessments.

### 6.3.3. Discussion and Analysis (Comparison to previous years and EIS)

Monitoring results from previous years (2012-2022) indicated that there was no breach in compliance at the commencement of works of Cell 1 and Cell 2.

There were no noise complaints over the 2022-2023 period, no change from the previous year.

**Table 6.4: Noise-related complaints**

| Previous Reporting Period | Internal Complaints | External Complaints |
|---|---|---|
| **2018-2019** | Nil | Nil |
| **2019-2020** | Nil | Nil |
| **2020-2021** | Nil | Nil |
| **2021-2022** | Nil | Nil |
| **2022-2023** | Nil | Nil |

#### 6.3.4. Non-Compliance and Corrective Actions during the 2022-2023 reporting period

There was no noise-related non-compliance during the 2022-2023 reporting period.

#### 6.3.5. Measures Implemented Over 2022-2023

Noise management measures that were implemented over the 2022-2023 period include:

- Prompt response to any community issues of concern.
- Refinement of onsite noise mitigation measures and quarry operating procedures, where practical.
- A noise attenuation bund wall was established in 2022 to reduce pumping noise intrusion to the closest receptors.

### 6.4. AIR QUALITY

#### 6.4.1. Predicted Impacts and Performance Criteria

Hanson has continued to operate against the conditional requirements provided in *Schedule 3, Conditions 2, 5, 6* and *7* of *MP 07_0069* and EPL 2433, as well as the approved Air Quality Management Plan. All reasonable and feasible avoidance and mitigation measures must be employed so that particulate matter emissions and dust generated by the Quarry does not cause exceedances in conditions set out in MP 07_0069 and EPL 2433.

The EIS concluded that dust deposition levels were predicted to be below the air quality criterion at all surrounding sensitive receivers. **Table 6.5** presents the predicted cumulative air quality impacts at the closest potentially affected residences to the Quarry (**Figure 4**). Cumulative annual TSP and $PM_{10}$ concentrations are predicted to satisfy the air quality criterion at all surrounding sensitive receptor locations for all modelled scenarios. Annual average TSP and PM10 concentrations were predicted to satisfy the air quality criterion at all sensitive receivers. This has been the case at the Quarry, including this Annual Review.

**Table 6.5: Predicted Annual Average (Background + Increment) PM10 Concentration (ug/m3)**

| | **PM10 – Annual Average (ug/m3)** | | | |
|---|---|---|---|---|
| ***Receptor*** | ***Background*** | ***Increment*** | ***Background + Increment*** | ***Project Goal*** |
| **Kullaroo 1** | 48.7 | 0.0 | 48.7 | 50 |
| **Kullaroo 2** | 48.7 | 0.2 | 48.9 | 50 |
| **Sweetwater** | 48.7 | 1.0 | 49.7 | 50 |

| | | | | |
|---|---|---|---|---|
| **Riverglen** | 48.7 | 0.8 | 49.5 | 50 |
| **Globine** | 48.7 | 0.1 | 48.8 | 50 |
| **Pomingalarna** | 48.7 | 0.1 | 48.8 | 50 |

**Tables 6.6**, **6.7** and **6.8** present the air quality performance criteria presented in *Condition 5(3)* of *MP 07_0069*.

**Table 6.6: PM10 - Annual Limits**

| Pollutant | Averaging Period | Criteria |
|---|---|---|
| **Total Solid Particulates (TSP)** | Annual | 90 µg/m$^3$ |
| **Particulate matter <10 µm ($PM_{10}$)** | Annual | 30 µg/m$^3$ |

**Table 6.7: PM10 - 24-hour Limits**

| Pollutant | Averaging Period | Criteria |
|---|---|---|
| **Particulate matter <10 µm ($PM_{10}$)** | 24hr | 50 µg/m$^3$ |

**Table 6.8: Deposited Dust - Annual and Monthly Limits**

| Pollutant | Averaging Period | Maximum Project Contribution | Maximum Total Deposited Dust Level |
|---|---|---|---|
| **Deposited Dust** | Annual | 2 g/m$^2$/month | 4 g/m$^2$/month |

Particulate matter emissions (PM10) are monitored at the Quarry through the DustTrak system located at the weigh station. $PM_{10}$ emissions have remained compliant with the limits established in *MP 07_0069*.

Five dust gauges are used to monitor deposited dust levels at the sensitive receptor locations. The results of monthly monitoring have generally demonstrated compliance with the annual average deposited dust limits established in *MP 07_0069*.

The Air Quality Management Plan was prepared by PAE Holmes detailing the assessment criteria, the monitoring locations and procedures, and the compliance checking procedures for the subsequent reporting in accordance with the Department of Planning and Environment (DPE) and the Environmental Protection Authority (EPA) requirements. The locations of the closest sensitive receptors are shown in **Figure 4** and **Table 6.9**.

**Table 6.9: Closest sensitive receptors**

| Residence ID | Distance to Site Boundary | Distance to processing Plant | East (m) | North (m) |
|---|---|---|---|---|
| **Kullaroo** | 0.2 | 1.7 | 527572 | 6117801 |
| **Sweetwater** | 0.2 | 1.4 | 528569 | 6117275 |
| **Riverglen** | 0.7 | 1.2 | 529831 | 6116625 |

| | | | | |
|---|---|---|---|---|
| **Globine** | 0.5 | 1.0 | 527908 | 6115201 |
| **Pomigalama** | 0.4 | 1.5 | 526301 | 6116493 |

All monitoring locations conform to the requirements of AS 3580.1.1:2007, subject to local site constraints. Monitoring activities are outlined in **Table 6.10** and shown in **Figure 5**.

Table 6.10: Monitoring activities and locations

| Site No. | Location | Parameter | Instrument | Frequency |
|---|---|---|---|---|
| **DDG1** | Dust deposition gauge located to the west of Roach Road just past the entrance to quarry. | Dust Deposition | DDG | 30 Days (± 2 days) |
| **DDG2** | Dust deposition gauge located approximately 220m northeast of the quarry pit. | Dust Deposition | DDG | 30 Days (± 2 days) |
| **DDG3** | Dust deposition gauge located 66m south of the primary sedimentation pond and 155m east of the main access road. | Dust Deposition | DDG | 30 Days (± 2 days) |
| **DDG4** | Dust deposition gauge located approximately 115m north of the quarry pit. | Dust Deposition | DDG | 30 Days (± 2 days) |
| **DDG5** | Dust deposition gauge located approximately 216m southeast of the quarry pit. | Dust Deposition | DDG | 30 Days (± 2 days) |
| **Met Station** | Proximity to Site Offices | Meteorological Parameters | AWS | Continuous |
| **DustTrak** | Proximity to Weigh Bridge | $PM_{10}$ | DustTrak | Continuous |
| **HVAS** | Proximity to Site Offices | $PM_{10}$ (TSP) | HVAS | 1-in-6 day monitoring for three months (completed, second campaign ongoing) |

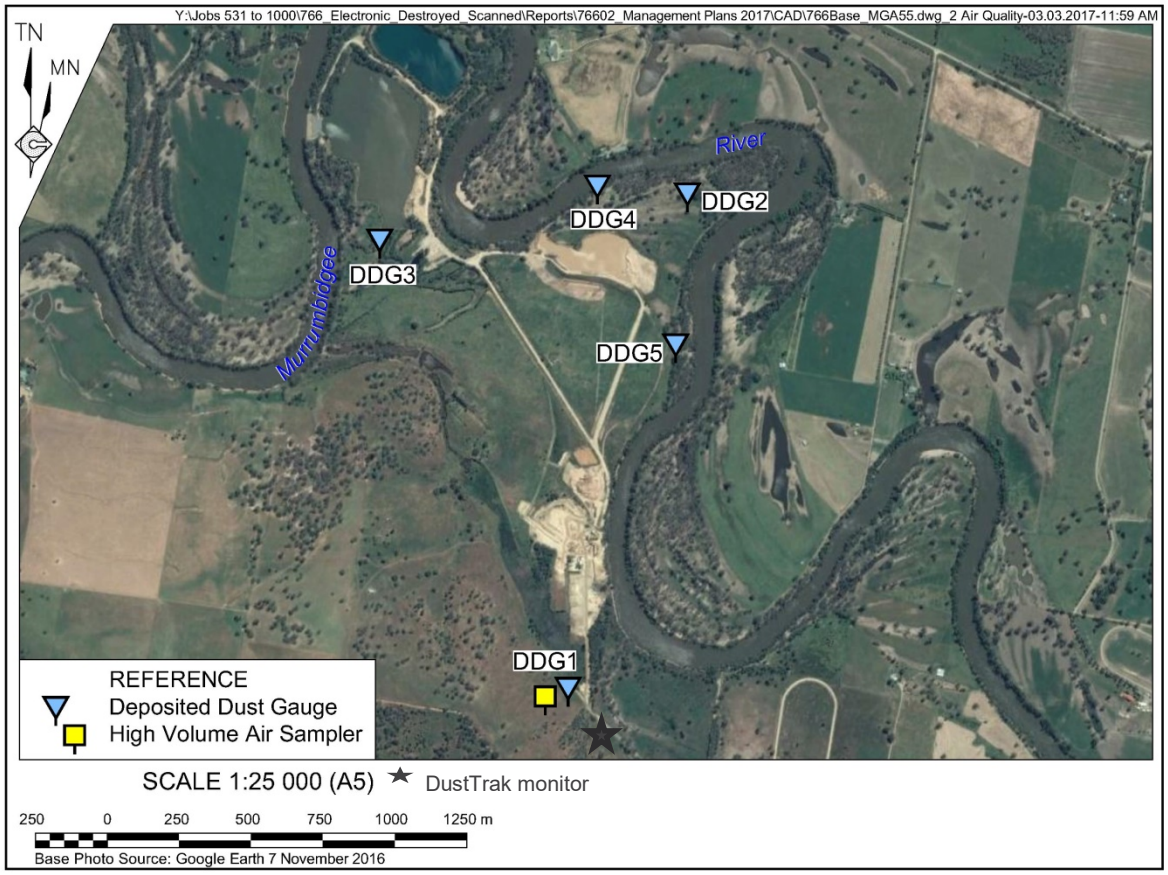


**Figure 5: Location of Air Monitors**

Under the EPL 2433, air quality emissions are to be monitored on a quarterly basis, as outlined in **Table 6.11**. Each monitoring point location is detailed in the EPL. All air monitoring results is required to be monitored and reported in the yearly annual return documents required by the EPL licencing conditions.

**Table 6.11: EPL air monitoring requirements**

| Locations | Pollutant | Units of Measure | Frequency | Sampling method |
|---|---|---|---|---|
| **DDG 1 (2), DDG 2 (3), DDG 3 (4), DDG 4 (5), DDG 5 (6)** | Total Solid Particles | Grams per square metre per month | Quarterly | Australian Standard 3580.10.1-2003 |

### 6.4.2. Measured Performance

#### 6.4.2.1. Total Suspended Particulate Matter

TSP was not monitored in the vicinity of the Quarry. The Air Quality Impact Assessment determined that the $PM_{10}$ to TSP ratio was calculated to be 50%. This was applied to the 2022-2023 $PM_{10}$ data to obtain an indicative TSP value in the absence of the TSP readings. Annual PM10 for 2022-2023 was recorded as 11.2 µg/m$^3$. Therefore, the TSP reading for 2022-2023 period is approximately 22.4 µg/m$^3$ (**Table 6.12**). This is below the 90 µg/m$^3$ TSP criteria and hence the Quarry is deemed compliant during the reporting period.

Table 6.12: Total Suspended Particles annual compliance

| $PM_{10}$ annual average | PM10 to TSP ratio | Calculated TSP | TSP criteria | Compliant |
|---|---|---|---|---|
| **11.2 µg/m³** | 50% | 20.4 µg/m³ | 90 µg/m³ | YES |

#### 6.4.2.2. Deposited Dust

Charles Sturt University performs monthly monitoring on deposited dust at the Quarry. Monitoring over the twelve-month period indicates that there was one instance of monthly levels that was higher than 4g/m²/month. All dust deposition gauges fell within the annual criterion of 4g/m²/month.

Deposited dust monitoring commenced at monitoring locations DDG1, DDG2, DDG3, DDG4 and DDG5 on approval of the consent and continued on a monthly basis during the reporting period. The locations of the deposited dust monitoring locations are shown on **Figure 5**. **Table 6.13** presents the results of the deposited dust monitoring program for the 2022-2023 monitoring period and previous monitoring period averages for comparison.

All samples recorded in 2022-2023 varied between 0.2g/m2/month and 8.1g/m2/month. The highest deposited dust level recorded during the reporting period was at DDG3 with multiple months result above 4g/m²/month. These high results are not reflected in the other DDG monitoring locations during this period. Further investigation was undertaken by the consultant with analysis indicating organic contamination of DDG3, DDG4 & DDG5 (local earthworks, high rainfall and flooding impacts).

Table 6.13: Measured Performance – Deposited Dust[1]

| Month | Total Insoluble Matter (g/m²/month) | | | | | Comment |
|---|---|---|---|---|---|---|
| | DDG1 | DDG2 | DDG3 | DDG4 | DDG5 | |
| **July** | 0.4 | 0.4 | 0.2 | 0.2 | 0.5 | |
| **August** | 1.9 | 0.6 | 2.1 | 0.4 | 1.6 | |
| **September** | 1.1 | 0.7 | 1.4 | **4.5** | 1.5 | High rainfall |
| **October** | 3.2 | 1.6 | 3.4 | **7.5** | 1 | High rainfall |
| **November** | 4 | **N/A** | 6.0 | **N/A** | **4.6** | Major flooding |
| **December** | 1.1 | 0.5 | 3.2 | **N/A** | 1.9 | Flooding impacts |
| **January** | 2.8 | 1.7 | **4.2** | **N/A** | 3.9 | Flooding impacts |
| **February** | 3.0 | 0.8 | 1.1 | **11.5** | 3.7 | Earthworks from Cell 1 backfilling |
| **March** | 1.9 | 2.7 | 4 | 3.2 | 0.2 | |
| **April** | 0.7 | <0.2 | 1.6 | 0.2 | **9.4** | Earthworks from Cell 1 backfilling |
| **May** | 0.8 | 0.5 | 0.5 | **56.9*** | 0.7 | * contaminated gauge resulting in faulty result that is not included in reporting period average. |
| **June** | 0.5 | 0.6 | 1.8 | 0.4 | 0.8 | |
| **Yearly Average[2]** | *1.9* | *1.0* | *2.5* | *0.4* | *3.4* | Annual average compliant at all DDG locations. |
| **2021-2022 Average[2]** | *1.3* | *0.9* | *1.1* | *1.1* | *1.1* | |
| **Note1: Units – g/m²/month**<br>**Note 2: Averaged over 12-month period**<br>**Note 3: B – Monitoring equipment broken** | | | | | | |
| **Source: Hanson Construction Materials Pty Ltd** | | | | | | |

The 2022-2023 annual average results for dust deposition gauges are higher than results from 2021-2022. Deposited dust monitoring results indicate that average annual rates of dust deposition in the vicinity of the Quarry remain below the criterion levels at each location.

#### 6.4.2.3. Particulate Matter Emissions (PM10 Concentration)

The concentration of PM10, namely that component of suspended particulates with an aerodynamic diameter of 10µm or less, commenced on approval of the consent using a DustTrak PM10 monitor (**Figure 5**). **Figure 6** presents the results of the PM10 dust monitoring during the reporting period. The monitored result for average annual PM10 was 11.2 µg/m$^3$ during the reporting period, which is below the annual average criteria level of 30µg/m$^3$.

Wagga Wagga BoM 2022-2023 PM10 24-hour dust concentration is provided in **Figure 7** as an indication of background levels experienced at Wagga Wagga Quarry. The annual average for the North Wagga Wagga BoM was 14.6 µg/m$^3$.

24-hour averaging period for $PM_{10}$ readings generally fell below the applicable 50 µg/m$^3$ criterion however there were multiple instances recorded $PM_{10}$ level for the 24-hour averaging period that were at or just below the criteria of 50 µg/m$^3$. The majority of the instances had the high levels occur outside of site operational hours. This indicates that site air quality management and mitigation during manned hours at the Quarry was reasonable and effective.

Based on this review $PM_{10}$ emissions have been compliant with the limits established in *MP07_0069* and *EPL 2433*.

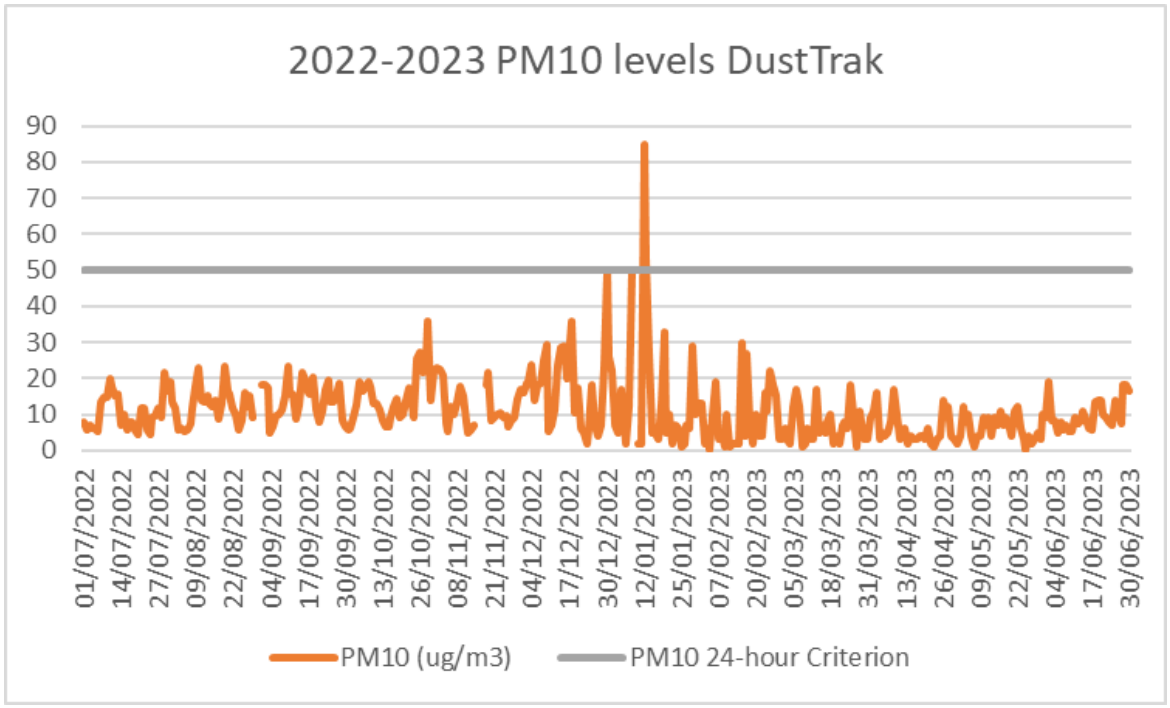


**Figure 6: Site $PM_{10}$ monitoring over the 2022-2023 period.**

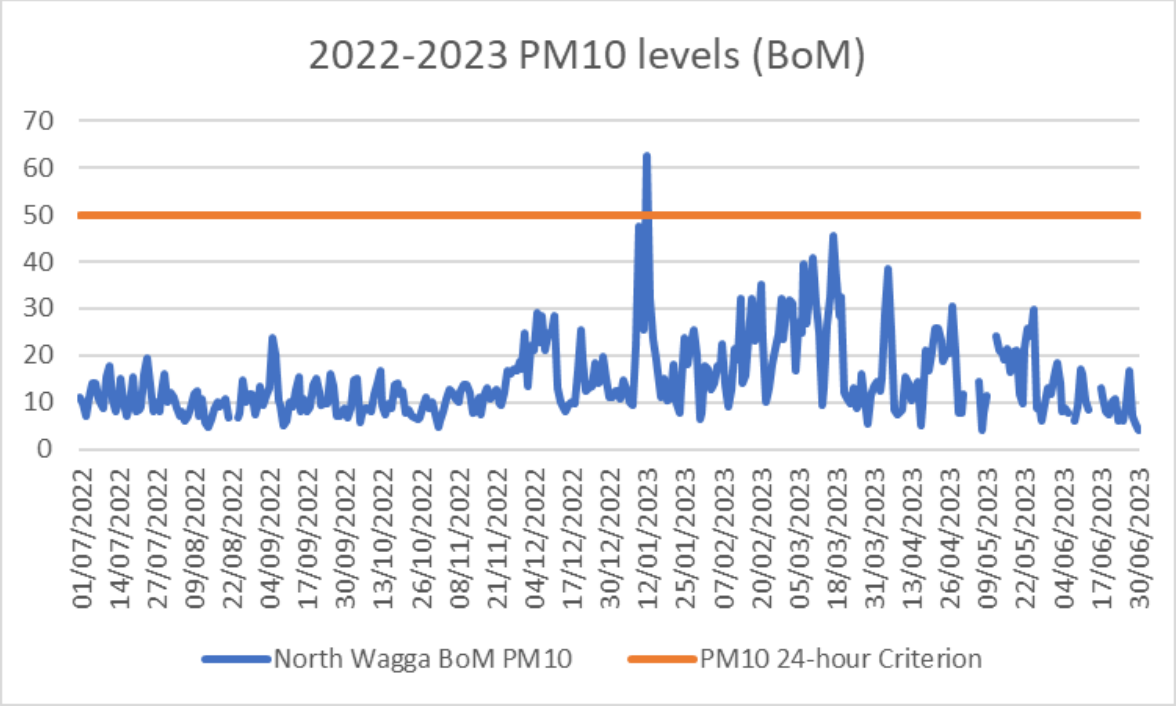


**Figure 7: North Wagga Wagga BoM $PM_{10}$ monitoring over the 2022-2023 period.**

### 6.4.3. Monitoring Results from Previous Years

There has been a decrease in 2022-2023 DDG results when compared to previous years (**Table 6.14**). This is most likely contributed to high rainfall conditions and limited bush fire events occurring in the reporting period.

**Table 6.14: Air monitoring comparison 2018-2023**

| Year | $PM_{10}$(µg/m$^3$) | TSP (µg/m$^3$) | DDG (g/m$^2$/month) annual average |
|---|---|---|---|
| **2018-2019** | 35.0 µg/m$^3$ (Non-Compliant) | 70.0 µg/m$^3$ (Compliant) | DDG1: 2.4 g/m$^2$/month Compliant<br>DDG2: 2.7 g/m$^2$/month Compliant<br>DDG3: 2.5 g/m$^2$/month Compliant<br>DDG4: 1.7 g/m$^2$/month Compliant<br>DDG5: 2.7 g/m$^2$/month Compliant |
| **2019-2020** | 25.9 µg/m$^3$ (Compliant) | 51.8 µg/m$^3$ (Compliant) | DDG1: 2.0 g/m$^2$/month Compliant<br>DDG2: 1.8 g/m$^2$/month Compliant<br>DDG3: 1.4 g/m$^2$/month Compliant<br>DDG4: 2.0 g/m$^2$/month Compliant<br>DDG5: 1.6 g/m$^2$/month Compliant |
| **2020-2021** | 13.09 µg/m$^3$ (Compliant) | 26.18 µg/m$^3$ (Compliant) | DDG1: 1.3 g/m$^2$/month Compliant<br>DDG2: 0.9 g/m$^2$/month Compliant<br>DDG3: 1.1 g/m$^2$/month Compliant<br>DDG4: 1.1 g/m$^2$/month Compliant<br>DDG5: 1.1 g/m$^2$/month Compliant |
| **2021-2022** | 10.3 µg/m$^3$ (Compliant) | 20.6 µg/m$^3$ (Compliant) | DDG1: 1.5 g/m$^2$/month Compliant<br>DDG2: 0.7 g/m$^2$/month Compliant<br>DDG3: 2.0 g/m$^2$/month Compliant<br>DDG4: 1.0 g/m$^2$/month Compliant |

| | | | |
|---|---|---|---|
| | | | DDG5: 1.1 g/m$^2$/month Compliant |
| **2022-2023** | 11.2 µg/m$^3$ (Compliant) | 22.4 µg/m$^3$ (Compliant) | DDG1: 1.9 g/m$^2$/month Compliant<br>DDG2: 1.0 g/m$^2$/month Compliant<br>DDG3: 3.0 g/m$^2$/month Compliant<br>DDG4: 4.0 g/m$^2$/month Compliant<br>DDG5: 2.4 g/m$^2$/month Compliant |

### 6.4.4. Discussion and Analysis

The results of dust and particulate monitoring during the reporting period demonstrated higher results compared to past years. DDG4 experienced multiple months where results above 4g/m$^2$/month which is due to the gauge being impacted by flooding and cell backfilling.

Review of historic deposited dust and particulate matter monitoring indicates the following.

- There is no discernible trend in deposited dust monitoring results with deposited dust levels generally remaining within criteria levels.
- Particulate matter emissions have decreased over levels recorded in 2018 and 2019 which may have resulted from the decreased intensity of operations.
- Particulate matter emissions have fluctuated over the last three years (2021, 2022, 2023) due to weather and climate changes (drought into El Nina and major flooding events).

### 6.4.5. Non-Compliance and Corrective Actions

There were no air-quality non-compliances for the 2022-2023 reporting period.

### 6.4.6. Measures Implemented 2022-2023

Specific dust management practices and mitigation measures are practiced at Wagga Wagga Quarry as detailed in the Air Quality Management Plan and continued throughout the 2022-2023 reporting period. Utilisation of the watercart prior to weekend shutdown is undertaken, especially when weather conditions are predicted to impact air quality levels when the quarry is not operating.

## 6.5. TRANSPORT

### 6.5.1. Overview

Truck movements are monitored through SAP Transportation Management System that registers the orders that leave the Quarry. This system ensures that the existing limits on hourly product truck despatch are not exceeded. However, in some cases customers request that a single truck order is despatched on two orders with the result that a single truck despatch is counted twice. This process has resulted in some non-compliance records, however, does not represent an exceedance of truck limits.

The Environmental Impact Statement (EIS) states that no matters should arise from the Quarry expansion other than noise attenuation. This matter was further explored in the application to modify the shoulder morning period truck movements in 2018-2019.

### 6.5.2. Relevant Statutory Requirements and Criteria

*Schedule 3, Condition 17* of the *Project Approval* requires Hanson to keep accurate records of transported product material. Schedule 2, Condition 6 states:

*The Proponent shall not:*

*(a) transport more than 150,000 tonnes of product from the site per calendar year;*

*(b) permit more than six heavy vehicle movements per hour (total of all quarry haulage truck movements into and out of the site) between 3:00pm and 6:00pm on any weekday, unless in the case of emergency or under the direction of police or other relevant authority.*

*Schedule 3, Condition 22* of Project Approval requires the implementation of a Transport Management Plan and Driver's Code of Conduct. The objectives of the Transport Management Plan are to:

- Ensure compliance with the conditions included under Schedules 2 & 3 of the Department of Planning and Infrastructure consent conditions with respect to traffic and transport matters;
- Encourage compliance and acceptance of the Truck Driver Code of Practice by all heavy vehicle drivers using the Quarry.
- Minimise traffic and transport impacts of the Quarry on the community,
- Foster an understanding and awareness within the company of community expectations and legislative requirements;
- Protect and enhance public safety through compliance with relevant road rules; and
- Increase occupational health and safety (OH&S) understanding in relation to fatigue, vehicle operation in public areas and obligation to general public.
- Heavy vehicle drivers hauling from Wagga Wagga Quarry must;
- Have undertaken a site induction carried out by an approved member of the Quarry staff or suitably qualified person under the direction of the Quarry management;
- Hold a valid driver's licence for the class of vehicle that they operate;
- Operate the vehicle in a safe manner within and external to the Quarry site;
- Comply with the direction of authorised site personnel when within the site; and
- Comply with the Australian Road Rules external to the site.

### 6.5.3. Monitoring Results

The potential exceedance and corresponding reasoning for potential exceedances during the 2022-2023 period is reported in **Table 6.15**. The full list of movements of the 2022-2023 period is found in **Appendix A.**

Table 6.15: Movement exceedance between 1/07/2022 to 30/06/2023

| Date | Time | Number allowed | Number dispatched | Reason | Compliant |
|---|---|---|---|---|---|
| N/A | N/A | N/A | N/A | N/A (no exceedances) | N/A |

### 6.5.4. Monitoring Results of Previous Years

As seen in Table **6.16**, there has been a decrease in the number of breaches over the last three years.

Table 6.16: Truck dispatch yearly comparison

| Reporting Period | Number of truck dispatch exceedances |
|---|---|
| **2018-2019** | There were no instances where transportation movements exceeded the stipulated 3 dispatches (now 6 as of October 2018) between the hours of 3pm-6pm (now 3pm-5pm and 3 dispatches between 5pm-6pm as of October 2018). There were no instances where the Saturday dispatch hours were exceeded. |
| **2019-2020** | There were no instances where transportation movements exceeded the stipulated 6 dispatches between the hours of 3pm-5pm and 3 dispatches between 5pm-6pm. There were no instances where the Saturday dispatch hours were exceeded. |
| **2020-2021** | There were no instances where transportation movements exceeded the stipulated 6 dispatches between the hours of 3pm-5pm and 3 dispatches between 5pm-6pm. There were no instances where the Saturday dispatch hours were exceeded. |
| **2021-2022** | There were no instances where transportation movements exceeded the stipulated 6 dispatches between the hours of 3pm-5pm and no dispatches between 5pm-6pm. There were no instances where the Saturday dispatch hours were exceeded. |
| **2022-2023** | There were no instances where transportation movements exceeded the stipulated 6 dispatches between the hours of 3pm-5pm and no dispatches between 5pm-6pm. There were no instances where the Saturday dispatch hours were exceeded. |

### 6.5.5. Non-Compliance and Corrective Actions

There were no exceedance in truck movements during the 2022-2023 period.

There were no traffic incidents in the 2022-2023 reporting period, as seen in **Table 6.17**.

Table 6.17: Traffic incidents

| Reporting period | Number of incidents | Details of incident |
|---|---|---|
| **2018-2019** | 0 | n/a |
| **2019-2020** | 0 | n/a |
| **2020-2021** | 0 | n/a |
| **2021-2022** | 0 | n/a |
| **2022-2023** | 0 | n/a |

#### 6.5.6. Measures Implemented over 2022-2023

The Quarry continued to operate the SAP counting system to monitor and manage truck dispatch numbers. New rules incorporated into the SAP reporting software have reduced the number of false positives such as split loads.

## 6.6. WATER MANAGEMENT

Water level monitoring is undertaken in seven (7) groundwater monitoring bores, while surface water quality is tested monthly. The implementation of the *Water Improvement Program* (Evans & Peck, 2013) has resulted in the Quarry adopting the use of a recycled processing water system. The consequential environmental improvement is the cessation of the need to draw processing water directly from the Murrumbidgee River. Accordingly, Hanson has removed the two river pumps and installed these within the internal water recycling system.

The water balance modelling undertaken in the 2011 EIS noted that the average demad for water at all stages of the quarry project range between 285ML to 360ML. 2022-2023 water take of 107.3ML is within the estimated take the Project.

### 6.6.1. Surface Water

#### 6.6.1.1. Predicted Impacts and Performance Criteria

The water management system involves:

- Extraction of material from the active cell (known as Cells 1 – 5) with dewatering redirecting groundwater to Process Plant Basin.
- The Process Plant Basin supplies the process plant with water.
- Waste (process) water from the process plant is either: - Discharged to the Process Plant Basin for recycling; or - Be used in the hydrocyclone sand processing plant then discharged to the wetland west of the process plant or if full, redirected to the Process Plant Basin for recycling.
- Process water directed to the Process Plant Basin shall be treated by settling and used for operation of the plant. Excess water shall discharge to Pit 2 with the existing open drain being extended to discharge to Pit 2.
- Pit 2 is to be used as a settling pond and storage for supply of the Process Plant Basin when required.
- Surplus from Pit 2 shall be transferred to Pit 1 then, subject to Environmental Protection License 2433 (EPL) water quality criteria being achieved, discharged to the Murrumbidgee River.
- Open voids (such as the active cell) capture direct rainfall which then forms part of the above system.
- Water extraction from the Murrumbidgee shall generally not be required, however, periodic use may occur if water quality in Pit 2 is inadequate for plant operating purposes

Condition L2.4 of the Quarry's Environment Protection Licence 2433 requires that water discharged from licenced discharge point 1 complies with the following water quality performance criteria.

- Total Suspended Solids – 50mg/L.

The Soil and Water Management Plan indicates that monitoring would be undertaken monthly during discharge. In addition, the Soil and Water Management Plan identifies that the following data will be recorded in this Annual Review.

- Volume of water used for dust suppression purposes.
- Volume of water imported to Site.
- Specific measures implemented as part of the water use reduction program, and their effectiveness.

The site is required to comply with Section 120 of the *Protection of the Environment Operations Act 1997*. The site has one (1) licenced discharge point to the Murrumbidgee River. The site's EPL stipulates performance criteria for discharge of water from site. Water discharged from the discharge point waters is not to exceed a water quality of TSS concentration of 50 mg/L during discharges.

#### 6.6.1.2. Measured Performance

Water discharge occurred in 2022-2023 monitoring period, generally from December 2022 to June 2023. Aditionally, water quality monitoring occurred in Pit 2 on a monthly basis, **Table 6.18**.

**Table 6.18: 2022-2023 Discharge Surface Water Quality Results**

| Month | Location | Test Type | Results | Criteria |
|---|---|---|---|---|
| **July 2022** | River | Lab | Conductivity – 140 µS/cm<br>pH – 6.8<br>TSS – 50 mg/L | pH – 6.5 and 8.5<br>TSS – 50mg/L<br>Oil and Grease – 10mg/L |
| | Pit 1 | | Conductivity – 450 µS/cm<br>pH – 6.8<br>TSS – <2 mg/L | |
| **August 2022** | River | Lab | Conductivity – 141 µS/cm<br>pH – 8.0<br>TSS – 9 mg/L | pH – 6.5 and 8.5<br>TSS – 50mg/L<br>Oil and Grease – 10mg/L |
| | Pit 1 | | Conductivity – 458 µS/cm<br>pH – 7.8<br>TSS – <2 mg/L | |
| **September 2022** | River | Lab | Conductivity – 175 µS/cm<br>pH – 7.0<br>TSS – 29 mg/L | pH – 6.5 and 8.5<br>TSS – 50mg/L<br>Oil and Grease – 10mg/L |
| | Pit 1 | | Conductivity – 460 µS/cm<br>pH – 7.7<br>TSS – <2 mg/L | |
| **October 2022** | River | Lab | Conductivity – 103 µS/cm<br>pH – 7.4<br>TSS – 20 mg/L | pH – 6.5 and 8.5<br>TSS – 50mg/L<br>Oil and Grease – 10mg/L |
| | Pit 1 | | Conductivity – 467 µS/cm<br>pH – 7.5<br>TSS – 7 mg/L | |
| **November 2022** | River | Lab | Conductivity – 180 µS/cm<br>pH – 6.6<br>TSS – 36 mg/L | pH – 6.5 and 8.5<br>TSS – 50mg/L<br>Oil and Grease – 10mg/L |
| | Pit 1 | | Conductivity – 468 µS/cm<br>pH – 7.2<br>TSS – <2 mg/L | |
| **December 2022** | River | Lab | Conductivity – 121 µS/cm<br>pH – 7.6<br>TSS – 23 mg/L | pH – 6.5 and 8.5<br>TSS – 50mg/L<br>Oil and Grease – 10mg/L |
| | Pit 1 | | Conductivity – 485 µS/cm<br>pH – 7.4<br>TSS – <2 mg/L | |
| **January 2023** | River | Lab | Conductivity – 114 µS/cm<br>pH – 6.2<br>TSS – 25 mg/L | pH – 6.5 and 8.5<br>TSS – 50mg/L<br>Oil and Grease – 10mg/L |
| | Pit 1 | | Conductivity – 496 µS/cm<br>pH – 6.8<br>TSS – 7 mg/L | |
| **February 2023** | River | Lab | Conductivity – 105 µS/cm<br>pH – 7.9<br>TSS – 16 mg/L | pH – 6.5 and 8.5<br>TSS – 50mg/L<br>Oil and Grease – 10mg/L |
| | Pit 1 | | Conductivity – 515 µS/cm<br>pH – 8.2<br>TSS – 2 mg/L | |
| **March 2023** | River | Lab | Conductivity – 144 µS/cm<br>pH – 6.6<br>TSS – 584 mg/L | pH – 6.5 and 8.5<br>TSS – 50mg/L<br>Oil and Grease – 10mg/L |
| | Pit 1 | | Conductivity – 508 µS/cm<br>pH – 7.3<br>TSS – 2 mg/L | |
| **April 2023** | River | Lab | Conductivity – 164 µS/cm<br>pH – 7.9<br>TSS – 7 mg/L | pH – 6.5 and 8.5<br>TSS – 50mg/L<br>Oil and Grease – 10mg/L |
| | Pit 1 | | Conductivity – 535 µS/cm<br>pH – 7.1 | |

| | | | | |
|---|---|---|---|---|
| | | | TSS – <2 mg/L | |
| **May 2023** | River | Lab | Conductivity – 121 µS/cm<br>pH – 8.1<br>TSS – 14 mg/L | pH – 6.5 and 8.5<br>TSS – 50mg/L<br>Oil and Grease – 10mg/L |
| | Pit 1 | | Conductivity – 531 µS/cm<br>pH – 7.9<br>TSS – <2 mg/L | |
| **June 2023** | River | Lab | Conductivity – 519 µS/cm<br>pH – 8.7<br>TSS – 7 mg/L | pH – 6.5 and 8.5<br>TSS – 50mg/L<br>Oil and Grease – 10mg/L |
| | Pit 1 | | Conductivity – 122 µS/cm<br>pH – 8.8<br>TSS – 13 mg/L | |

#### 6.6.1.3. Discussion and Analysis

Water use during the reporting period was within the licenced allocation per annum (see **Appendix C**). Discharge occurred from December 2022 until the end of the reporting period.

### 6.6.2. Groundwater

The implementation of the Water Improvement Program (11 March 2013), Evans & Peck, in particular the Water management Option 1 identified in that report, has resulted in the quarry adopting the use of a recycled processing water system. The consequential environmental improvement is the cessation of the need to draw processing water directly from the Murrumbidgee River. Accordingly, Hanson has removed the two river pumps and installed these within the internal water recycling system. The current licensed groundwater allocation in this period is 385 ML with total groundwater take from all pits sitting at 385 ML/year.

Groundwater data is recorded hourly using Dipper Logger Heron Software. This data is stored in the Dipper Logger and is collected periodically and uploaded digitally. The compensated water depth (MB GL) of groundwater from the seven monitoring bores is depicted in **Figure 8**.

**Figure 8: Groundwater Monitoring Bore Results**

In 2021 Hanson gained approval from the Secretary to allow extraction to a depth of 152 m AHD for Stage 1 to 5 of the Project, fulfilling the requirements within Condition 7 of Schedule 2.

The water management performance verification report concluded that the site has implicated the recommendations of the CMR and achieved all of the requirements of Condition 16 of the Project Approval Conditions. Assessment of groundwater monitoring and review of groundwater modelling concludes that the deepening of the Wagga Wagga Quarry to 152 m AHD shall not result in any groundwater drawdown in excess of that anticipated in the EA.

**Table 6.19: Quarry water licencing entitlements**

| WAL # | Water sharing plan, source and management zone (as applicable) | Entitlement |
|---|---|---|
| **WAL37001** | Murrumbidgee regulated river water source | 100 Units |
| **WAL3788** | Murrumbidgee regulated river water source | 50 Units |
| **WAL33474** | Wagga Wagga alluvial groundwater source | 360 Units |
| **SWC784733** | Temporary water allocation. | 25 Units |

#### 6.6.2.1. Predicted Impacts and Performance Criteria

Potential groundwater-related impacts associated with the approved Quarry include drawdown of the regional aquifer of approximately 0.6m as the Extraction Area is extended to its final depth. No significant impacts are anticipated on groundwater quality and flow, surrounding groundwater users, or Groundwater Dependent Ecosystems.

Section 11.3 of the Soil and Water Management Plan identifies the following groundwater level performance criteria for surrounding non-Quarry related bores.

- standing water level below 10th percentile measured level; or
- standing water level below intake during normal operation of the bore.

#### 6.6.2.2. Measured Performance

Monitoring of groundwater standing levels was undertaken using automated data loggers which record standing water levels every six hours. It is noted that standing water levels are also measured manually each quarter by Hanson personnel. Figure 8 presents the results of monitoring of standing water levels between 1 July 2022 and 30 June 2023. It's important to note that groundwater monitoring was disrupted for a number of months following the major flooding that occurred at Wagga Wagga Quarry in November 2022.

### 6.6.3. Flooding History at the Site

Wagga Wagga Quarry is located on the banks of a large meander of the Murrumbidgee River. Due to the locality of the quarry, it has been subject to four major flooding events.

- December 2010 where the Murrumbidgee River reached 9.702m (15.5 years ARI); and
- March 2012 in which the Murrumbidgee River reached 10.602m (58years ARI).
- October 2016 where the Murrumbidgee River reached 8.952m.
- November 2022 in which the Murrumbidgee River reached 9.72m

In the flooding event of 2022, the riverbank and fuse plug/spillway of Pit 2 performed as per its design. The wall between Cell 1 and Cell 2 colapsed due to incoming flooding waters. The collapsing wall resulted in loss access to bore 705. There was no breach between Cell 1 and the river, which occurred in 2016.

**Figure 9: November 2022 Flooding, breach of wall between Cell 1 and Cell 2 (facing North towards active cells and River).**

### 6.6.4. Discussion and Analysis

#### 6.6.4.1. Standing Water Levels

Wagga Wagga Quarry has seven (7) active borehole water depth loggers located on site collecting and recording continuous water depth and temperature readings. The locations of these monitoring boreholes are depicted in **Figure 7**. Consistent with previous years, there was limited variation in water levels in bore hole except for what was recorded post-November 2022 flooding event. As can be seen in Figure 11, the site was still managing flood waters in February 2023.

Continued water quality monitoring was completed in accordance with EPL, Project Approval Conditions and Water Management Plans.

The monitoring data presented in Figure 8 indicate that standing water levels within all bores experiencing increases in standing water levels through the reporting period. Upon review of the long-term records, it can be concluded that the groundwater table in the vicinity of these bores is experiencing infiltration during heavy rainfall experienced in 2022. It is expected that the groundwater table will return to equilibrium now that La Nina has passed, similar to what was experienced after 2016 high rainfall event.

Due to the perched flood water within Cell 1, there is expected to be very limited groundwater incursion occurring in the previously active Cell 1.


**Figure 10: Location of Groundwater Monitoring Bores (no logger in 706)**

Figure 11: Colapse of wall between Cell 1 and Cell2 – February 2023.

## Surface Water Results

Water is tested monthly from the “Settling Pond” and the “River”. All results during the reporting period comply with the limits stipulated within the EPL (Table 6.18). Multiple discharges occurred during the 2012-2023 period, post 2022 flooding even, within the stipulated discharge amounts required within the site’s EPL.

### 6.6.5. Monitoring Results of Previous Years

Results are consistent with those of the 2022-2023 reporting period.

Table 6.20: Comparison between previous reporting periods

| Reporting Year | Exceedances |
|---|---|
| **2018 – 2019** | Nil |
| **2019 - 2020** | Nil |

| | |
|---|---|
| **2020 - 2021** | Nil |
| **2021 - 2022** | Nil |
| **2022 - 2023** | Nil |

### 6.6.6. Non-Compliance and Corrective Actions

Discharge during the 2022-2023 period monitoring results were all within the required limits of the EPL and Water Management Plan. The flooding contingency requirements of the site's Water Management Plan were followed, resulting in no uncontrolled discharge of operational waters from the site as well as no direct connection between the site's pits, cells and river.

The inclusion of the v-notch weir for water volume monitoring did not occur in the 2022-2023 monitoring period. Additionally, water volume monitoring at water meters across the site did not occur in 2023 due to either being under flood waters or buried under mud and shifted soils/particulates. As limited to no processing has occurred in 2023, there has been limited water recycling occurring on the site, resulting in limited impacts on the environment.

Access to groundwater loggers was limited post November 2022 flooding and, as such, the quarterly download was not completed in 2023 (March, June).

## 6.7. REHABILITATION PERFORMANCE DURING THE REPORTING PERIOD

The site operates in accordance with the Wagga Wagga Quarry Rehabilitation Management Plan.

Self-seeding has been the predominant rehabilitation strategy applied at Wagga Wagga quarry. Mature *Eucalyptus camaldulensis* dominate the banks of the Murrumbidgee River. Pollination by insects, birds and small mammals, enables the species to release numerous fertilised seeds per year. If the conditions are acceptable, these seeds will germinate into viable saplings. The succession of vegetation in these areas will develop soil structure integrity and promote associated ecological system benefits.

Hanson has endeavoured to implement management measures in accordance with the Project Approval to minimise impact on threatened species, populations and EECs. Under Schedule 3, Condition 38 of MP 07_0069, the Quarry is required to rehabilitate the site in accordance with objectives in **Table 6.22**.

The Project Approval requires a Rehabilitation Management Plan. The Statement of Commitments stipulates the following:

- Vegetation Clearance Management Plan
- Revegetation Plan
- Feral Animal Control Management Plan
- Weed Management Plan

The Wagga Wagga Quarry Rehabilitation Management Plan includes a Vegetation Clearance Management Plan, Revegetation Plan, Feral Animal Control Management Plan and Weed Management Plan.

**Table 6.21: Performance against the Rehabilitation Management Plan**

| Objective Outlined in Management Plan | Compliance over the reporting period |
|---|---|
| **Clearing of native vegetation, hollow stumps and fallen timber** | |
| **Any hollow logs currently present within Cell 1 of the proposal will be removed and stockpiled for use in restoration following the completion of extraction at each stage. Logging waste will be stockpiled on the outer of Cell 1 (to the North-East) away from the area which is to be excavated for the quarry pit.** | *Logs were re-allocated on site. Completed.* |
| **Vegetation to be retained outside of the extraction areas will be fenced off to protect it from machinery.** | *Rehabilitation area has been fenced off.*<br>*Vegetation is excluded by the strategic construction and use of haul roads on site and identified workings areas, preventing off road transit.* |
| **Top soil will be stockpiled and used in rehabilitation work as each stage is exhausted. It is expected that Cell 1 and about 80m to the south will be filled back to the existing ground level and revegetated on completion of extraction in Cell 1. The remainder of Cells 2 and 3 will be flooded and used for water storage upon their completion of extraction.** | *Top soil is stockpiled when it is not used for works on site directly. Backfilling of Cell 1 began in 2023, with it to continue of the next reporting period.* |

| | |
|---|---|
| **Quarry sand and gravel material will be extracted using a 40T excavator and material will be transported to the crushing plant in the south of the property via 35T dump trucks.** | *Noted.* |
| **The banks of each stage will be revegetated with native plant species similar to the surrounding vegetation community (river red gum forest/woodland), ultimately resulting in a series of dams similar to the restored area in the north-west of the existing Pit 1.** | *Backfilling of Cell 1 has commenced with capping of Cell 1 to occur in the next reporting period.* |
| **A fauna expert/trained wildlife rescue person will be called in the event that any wildlife is found during the removal of the hollow bearing tree within Cell 4. This person will be trained in handling and identification of a range of fauna, particularly birds and bats and be vaccinated for rabies as protection against the bat lyssavirus.** | *Not triggered.* |
| **Revegetation and prevention of feral animals** | |
| **Baiting of rabbits, foxes and cats within the confines of the quarry as required.** | *Not required during the reporting period.* |
| **Areas outside the quarry pit areas that are revegetated, including the riparian vegetation along the Murrumbidgee River, will be fenced to prevent cattle from entering. Fences will be maintained in good repair and will be regularly patrolled. The use of barbed wire will be avoided as squirrel gliders and other fauna are known to become tangled and could suffer a long and painful death.** | *The fences around the property were not impacted by the 2022 floods.*<br>*The fences are inspected by quarry staff approximately every quarter. In addition, the adjacent landholder inspects fencing regularly as part of their farming operations.* |
| **Revegetation will allow a natural regrowth of trees, shrubs and groundcovers. River Red Gums are likely to spread from local seed, however shrubs and groundcovers may need to be planted. Only species natural to the River Red Gum Forest/Woodland will be planted.** | *Noted.* |
| **New hauls roads will be constructed to eliminate impact on existing riparian habitats.** | *The site uses designated haul roads.* |
| **Weed management control** | |
| **Systematic surveys and inspections of land within the control area.** | *Quarry manager informally surveys the site for weeds on a regular basis.* |
| **Plan strategic weed management programs for the control area and keep records of such programs** | *During the reporting period, Wagga Wagga Quarry was inspected for weeds by Wagga Wagga City Local Council. It was deemed that no significant weeds were identified on site and general hygiene practises on site were deemed satisfactory and actual excavation area free of weed material.* |
| **Treat weeds with an herbicide registered for control in the manner according to the label or any permit for that herbicide.** | *During the reporting period, Wagga Wagga Quarry was inspected for weeds by Wagga Wagga City Local Council. It was deemed that no significant weeds were identified on site and general hygiene practises on* |

| | |
|---|---|
| | *site were deemed satisfactory and actual excavation area free of weed material.* |
| **Coordinate the implementation of weed management plans.** | *Noted.* |
| **Control Re-growth annually.** | *Noted.* |

A Vegetation Management Plan for the Riverbank Repair was prepared June 2013 by Geoff Cunningham Natural Resource Consultants Pty Ltd.

**Table 6.22: Performance against the Vegetation Management Plan for the Riverbank Repair**

| VMP Requirement | Action |
|---|---|
| **The River Red Gums to be established should be grown from locally sourced seed to ensure that the establishing trees have the same genetic qualities as the River Red Gums that are already growing in the vicinity.** | Completed. |
| **The trees should be planted from the top of the bank [levee] to the point where the natural growth of the gallery trees ends closer to the river's normal channel. Figure 1 shows the area that is proposed to be planted on both the inside [quarry side] face of the repaired bank and on the river side.** | Completed. |
| **A suggested irregular spacing is between 5 and 10 metres.** | Completed. |
| **Around each planted seedling an area 3m x 3m square should be protected by rock armouring comprised of stones about 15cm in diameter.** | Not implemented. This is considered to be a low risk threat. Fallen tree logs may be substituted where appropriate. |
| **Each seedling should also be protected by a welded mesh tree guard to protect it from grazing by rabbits, kangaroos and wayward sheep or cattle.** | Completed. |
| **WITHOUT FAIL, the Quarry Manager should have the tree guards removed as soon as there is an indication that the site is about to experience a flood or high river level. The guards should be progressively removed as the river rises and then replaced at it falls.** | Completed. |
| **Any seedlings that die should be immediately replaced as should any that are washed out by floodwater.** | Completed. |
| **Any introduced shrubs and trees such as Blackberry, Briar Rose, fruit trees, exotic ornamentals or Willows should be treated with herbicide to remove them from the area being revegetated as soon as they appear.** | Not yet triggered. |
| **A maintenance period of four years should apply to the works proposed. This should allow the planted** | Completed. |

| | |
|---|---|
| **trees to establish sufficiently to allow the tree guards and star pickets to be removed and an adequate ground cover to establish.** | |

### 6.7.1. Monitoring Results

Planting of Red River Gums has been completed at the riverbank repair works. Red River Gum is a species that is planted in accordance with the *Rehabilitation Management Plan*. Rehabilitation works have been slow to progress due to unfavourable conditions occurring in 2022. The site is still on track with the progress plan presented in the Rehabilitation Management Plan, though timing hasn't been met due to extension of quarrying operations in Cell 1 due to approval to go deeper in 2021.

Wagga Wagga quarry will continue to operate its rehabilitation as is current, which does not include active spraying or removal of weeds on site. Should weeds alter in terms of the species on site, or the spread of weeds, the quarry management will assess site applicable weed maintenance/removal measures.

### 6.7.2. Monitoring Results of Previous Years

Monitoring results are similar to previous years.

### 6.7.3. Non-Compliance and Corrective Actions

There have been no non-compliance or corrective actions required in the 2022-2023 period.

### 6.7.4. Measures Implemented over 2022-2023

Hanson continues to provide maintenance of plantings at the Pit 1 rehabilitation area. Site observations are undertaken to ensure weed management is being undertaken correctly. Cell 1 rehabilitation works have begun with backfilling occurring in 2023.

# 7. INDEPENDENT AUDIT

An Independent Environmental Audit of operations under *07_0069* occurred in September 2020. The audit report identified a variety of non-compliances, which can be reviewed via the IEA – available on the Hanson website.

The majority of non-compliances were addressed by Hanson following review of the audit results. A timeline for outstanding matters has been provided to DPE with the majority of non-compliances closed out by June 2021. The next Independent Environmental Audit will take place in the 2023-2024 reporting period.

# 8. COMMUNICATION

## 8.1. STAKEHOLDER AND COMMUNITY CONSULTATION

The Wagga Wagga Quarry Community Consultative Committee (WWQCC) was established in accordance with the NSW Government Guidelines for Establishing and Operating a Community Consultative Committee for Mining Projects (Guidelines), (Department of Planning 2007). The committee is made up of representatives of the following:

- Riverview Estate – 4 representatives
- Hanson – 2 representatives, plus a minute taker
- Chair – Independent Chair
- Wagga Wagga City Council – 1 representative

Due to CCC members moving away or lack of interest in the committee, a CCC meeting didn't occur in the reporting period. Due to the site going into care & maintenance, Hanson will apply for the suspension of CCC meetings until the site becomes active in production.

## 8.2. GOVERNMENT AGENCY CONSULTATION

Correspondence received from government agencies is summarised below:

- Approval of the Wagga Wagga Quarry Environmental Management Strategy (4 July 2022)
- Submission of Wagga Wagga Quarry Extension Project (MP 07_0069) Annual Review July 2021 - June 2022 (1 October 2022).
- Department completed its assessment of the Wagga Wagga Quarry Annual Review 2021-2022 (19 October 2022)
- Report of flooding of the site, that could result in uncontrolled discharge from surface flood waters exiting the site (4 November 2022).
- Correspondence from DPE requesting additional information regarding the 4 November 2022 report (7 November 2022).
- Correspondence from DPE notifying that the department notes the incident and has no further comments on the matter (14 November 2022).
- Report of Cell levee collapse (15 November 2022).

## 9. INCIDENT REPORTING

Hanson shall notify the relevant government authorities of any incident associated with the Quarry immediately after the Company becomes aware of the incident, as per the Wagga Wagga Quarry Pollution Incident Response Management Plan. Within 7 days of the date of the incident, Hanson will provide the relevant agencies with a detailed report on the incident.

Two incidents were reported in the 2022-2023 reporting period, directly related to the November 2022 major flooding event that occurred at the Wagga Wagga Quarry.

# 10. CONCLUSION

Hanson has incorporated environmental monitoring and management as an integral component in the operations at Wagga Wagga Quarry. This is shown in Project Approval compliance and lack of complaints pertaining to the project. Hanson's major concern since the 2016 flooding event has been the repair of the riverbank to ensure project compliance and facilitation of the return to standard quarry practices. This reporting period has documented structural completion of these works and the implementation of the *Water Management Improvement Program.*

The project will enter into a care and maintenance period in the next reporting period, with extraction and processing haulted due to maintenance works occurring at the site. This will likely occur over the entire reporting period of 2023-2024 and beyond.

Hanson's Wagga Wagga Quarry has been operating based on a collegial relationship between the surrounding amenity, community and environment and will endeavour to continue this over the project life.

# Appendix A

Transport Movements

# Appendix B

Air and Water Quality Monitoring

# Appendix C

Annual Water Balance (Martens, 2023)