BORAL LAND AND PROPERTY GROUP
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Berrima Cement Works

Statement of Environmental Effects
Solid Waste Derived Fuels Shed Extension
February 2019
Section 4.55(1A) Modification Application

Control Sheet

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Review

Reviewer ***Title***	**Approval**	**Date**	**Change (Y/N)**
Adnan Voloder *Planning & Development Manager*	YES	05/02/2019	Y
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Authorisation

Authorised by	**Title**	**Approval**	**Date**
Kate Jackson	Regional Manager NSW/ACT	YES	08/02/2019

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Sally Munk	08/02/2019	Department of Planning & Environment
Berrima Cement Works	08/02/2019	Boral Cement

Contents

1. Introduction

1.1 Project overview

Boral Cement Limited (formerly known as Blue Circle Southern Cement Ltd, hereafter 'Boral') operates the New Berrima Cement Works (the facility) in the Wingecarribe local government area (LGA). Operating since 1929 the site produces an array of cement products for use in domestic and international construction markets.

The facility operates subject to two development consents issued by the Department of Planning and Environment (DPE), namely; DA 401-11-2002 (Kiln 6, May 2003); and DA 85-4-2005 (Mill 7, Aug 2005). The development consent for DA 401-11-2002 has been modified nine times. The site is also subject to an Environment Protection Licence (EPL 1689) issued by the NSW Environment Protection Authority (EPA).

MOD 9 of DA-401-11-2002, the latest modification, sought for the approval to use Solid Waste Derived Fuels (SWDF) as an energy source and the construction of a SWDF storage shed and kiln feeding system. The approval history of the facility is summarised in **Table 1.1** below.

Table 1.1 SWDF storage shed specification

Date	Approval		Particulars
	Mod No.	Reference	
26 September 2005	1	MOD 2-1-2004	Use of non-standard fuels
22 September 2006	2	MOD 109-9-2006	Removal of hazardous waste prohibition
13 February 2007	3	MOD 12-2-2007	Trial use of tyre chips
24 April 2008	4	MOD 4	Varying usage of coke fines
31 August 2009	5	MOD 5	Coal deliveries by rail
20 June 2012	6	MOD 6	Stockpiling of coal for sale and transport
16 April 2012	7	MOD 7	Trial and use of blast furnace slag
5 August 2012	8	MOD 8	Administrative changes to align DA and EPL
5 October 2016	9	MOD 9	Receipt and use of up to 100,000 tpa of SWDFs

Boral submits this application pursuant to Section 4.55 (1A) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to modify State Significant Development (SSD) DA 401-11-2002. The proposed modification includes:

- changes to the dimensions of the SWDF storage shed; and
- sundry improvements to the existing SWDF storage shed including a minor extension to vehicle access doors to improve vehicle access and maneuverability.

No other operational changes are proposed as part of the modification.

1.2 The applicant

The proponent and owner of the Cement Works is Boral Cement Limited, formerly known as Blue Circle Southern Cement Ltd., which is a wholly owned subsidiary of Boral Limited.

Boral is an international building and construction materials group, headquartered in North Sydney, Australia. Boral's competitive position is underpinned by being a market leader in cement and construction materials in Australasia, the Boral USG Joint Venture plasterboard business in Australia and Asia, and cladding and roof tiles in the USA.

Boral Australia employs over 5,000 employees in its quarry, concrete, asphalt, concrete placing and cement operations. The business is a major supplier of products to the dwelling, commercial construction, and roads and engineering markets.

In NSW, Boral operates over 110 quarries, sand pits, gravel operations, asphalt and concrete plants producing products such as concrete aggregates, crushed rock, asphalt and sealing aggregates, road base materials, sand and gravels for the Australian construction materials industry.

2. Site location and context

2.1 Site location

The facility is located south of New Berrima in the Southern Highlands of NSW in the Wingecarribe local government area (LGA) (**Figure 2.1**). Access is via Taylor Avenue, which connects the facility with the Hume Highway, approximately 2.5km to the west.

The facility is located on Boral owned land, which comprises approximately 135 ha. The area to the south east of the Cement Works between New Berrima and Moss Vale is part of the Moss Vale Enterprise Corridor (MVEC) set aside for employment generating development under the Wingecarribe LEP.

The closest residential zone to the works site is located in New Berrima, approximately 650m north from the No 6 Kiln stack at the closest points. Residential zones are also located in New Berrima, approximately 2,150m north of the No. 6 kiln stack. New Berrima residential area is flanked to the south and east by "Private Recreation" areas.

The subject of this modification, the SWDF storage shed, occupies a small area of the facility (approximately 0.7 ha) and is located to the south-west of the complex (**Figure 2.2**).

2.2 Land use designation and zoning

The site is situated within the Wingecarribe LGA and is zoned Heavy Industrial (IN3). The land to the immediate east and south zoned General Industrial (IN1).

Land uses surrounding the site is shown in **Figure 2.3**.

Figure 2.1 Regional context

Figure 2.2 Local context

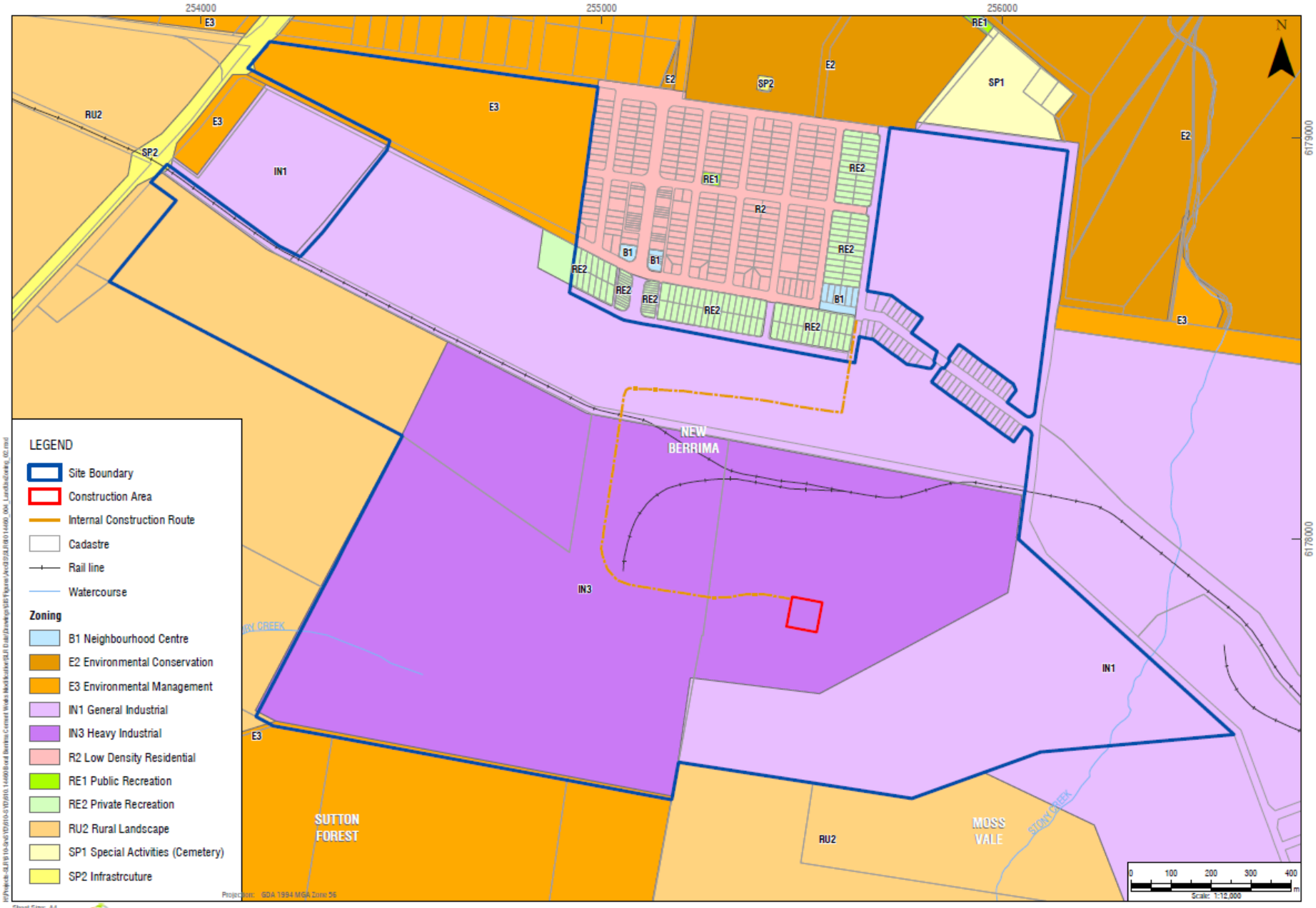

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Figure 2.3 Land-use zones surrounding Berrima Cement Works

3. Existing operations

Operating since 1929, the Berrima Cement Works produces up to 1.56 million tonnes of cement products (cement and clinker) for sale in NSW, the ACT and internationally. This product is transported via road, rail and sea via Port Kembla.

The facility operates one kiln and two cement mills, along with ancillary storage and stockpile facilities. Cement manufacture is an energy intensive process due to the high temperatures required to produce clinker. To fuel this process, the site utilises a range of fuel sources including coal; gas; diesel; and SWDFs.

In 2016, Boral modified its project approval to use up to 100,000 tonnes of SWDF per year as a substitute for conventional fuels. These fuels, consisting of wood waste and refuse derived fuel (RDF), are delivered in accordance with the facility's approved hours, namely between 6am to 6pm on weekdays to 7am to 1pm on Saturdays.

When delivered to the site tyre chips and wood waste are delivered in bulk and stored within the SWDF storage shed where a handling and feeding system feeds the fuel to the preheater tower.

The SWDF storage, handling and feeding system is located to the south of Kiln 6 pre-heater tower and comprises:

- receival and storage shed;
- RDF bale feed conveyor to feed bales into the receival shed;
- de-baler/shredder and feed system at the back end of the storage shed;
- enclosed conveyor from the storage shed to pre-calciner vessel located in the preheater tower; and
- screw conveyor and air sealing device around the pre-calciner in the form of covered (plastic wrapped) bales or within covered delivery vehicles.

Due to budgetary constraints, a smaller, economic design was chosen to be constructed within the footprint of the approved SWDF storage shed. As a result of proceeding with a smaller design, the storage capacity and throughput volume of the SWDF storage and handling facility was made smaller. A comparison between the 'approved' and 'as-built' design specifications is provided in **Table 3.1**.

Table 3.1 SWDF storage shed specification

	Width (m)	Length (m)	Floor area (m2)	Storage capacity (m3 of SWDF)
Approved	30	50	1,650	44,230
As built	16	45	720	19,300

The substitution from conventional fuels to alternate SWDFs has been successful, however due to proceeding with a smaller design, the facility is constrained in the amount of SWDF that can be processed and fed to Kiln 6. Additionally, due to the reduced storage capacity, the facility experiences a shortage of SWDF over weekend periods (Saturday afternoon, Sunday) and must rely upon conventional fuels such as coal and natural gas at these times.

4. Proposed modification

The proposed modification involves:

- changes to the dimensions of the SWDF storage shed; and
- sundry improvements to the existing SWDF storage shed including a minor extension to vehicle access doors to improve vehicle access and maneuverability.

A modification of DA DA-401-11-2002 is being sought to amend condition 1.2 (p) (i), which currently states the following:

> ***Scope of Development***
>
> *1.2 The Applicant shall carry out the development in accordance with:*
>
> p) MOD 9 for the use of Solid Waste Derived Fuel as a non-standard fuel for Kiln 6 and accompanying documents:
>
> i. the Environmental Assessment entitled 'Use of Waste Derived Fuels Kiln 6, Berrima Cement Works DA 401-11-2002 – Modification 9' dated July 2015 and prepared by Boral Cement Limited; and

The approved plans for the SWDF storage shed are contained within Appendix A of the EA submitted for Mod 9.

It proposed to amend condition 1.2 of the DA to extend the dimensions of the SWDF storage shed via an additional condition as follows:

> q) MOD 10 for the construction of extensions to the Solid Waste Derived Fuel shed in accordance with accompanying documents, namely the Statement of Environmental Effects entitled 'Solid Waste Derived Fuels Shed Extension' dated February 2019 and prepared by Boral Cement Limited.

4.1 SWDF storage shed

The approved SWDF storage shed and related handling and feeding system was designed to store up to 44,230 m^3 of SWDF at any time, allowing for a maximum throughput capacity of up to 100,000 tonnes per annum (tpa). However due to budgetary constraints a more cost-effective and smaller design was selected for construction (within the footprint of the approved SWDF shed).

The 'as-built' SWDF storage and handling facility can only achieve a throughput of 55,000 tpa. Additionally, due to reduced stockpile capacity and restrictions in delivery hours, the facility experiences a shortage in available SWDFs over weekend periods.

In order to address the above issues, minor changes to the approved SWDF storage shed specifications are proposed which includes a northward extension of the SWDF shed by 24 metres. A summary of the proposed changes to the SWDF storage shed specifications are provided in **Table 4.1**.

Table 4.1 Proposed changes to SWDF storage shed

	Approved (MOD 9)	'As built'	Proposed (MOD 10)
SWDF shed specification			
Width (m)	30	16	16
Length (m)	50	45	69
Floor area (m^2)	1,650	720	1,104
Height (m)	16.5	No change	No change
SWDF storage and throughput			
Maximum SWDF throughput to Kiln 6 Operations (tpa)	100,000	No change	No change

The proposed extension to the 'as-built' SWDF shed would allow the facility to receipt and stockpile an additional 2,400 m3 of SWDF at any one time. Further, it would ensure a more consistent heating methodology can be applied to the kiln, and allow for a more targeted delivery strategy of SWDF materials. No changes are required in relation to delivery hours or volumes.

The proposed sundry improvements to the shed would allow for improved vehicle access and maneuverability during deliveries and address efficiency and safety concerns on site.

No other change to the facility, its operations or any other aspects of the approved project is proposed. There would be no change to the maximum quantities of SWDF classes used at the facility.

The proposed extension and elevations are shown at **Appendix A.**

4.2 Construction

Construction is anticipated to take approximately 18 weeks, commencing after modification approval is granted, subject to modification approval. Construction activities would be limited to normal working hours and the maximum number of construction staff on site at any one time would be approximately 18 personnel. The plant and equipment that would be required for the construction works is similar to that employed during the course of Mod 9 works and is provided in **Table 4.3**

Table 4.3 Required construction plant and equipment

• Rear mounted drill rig on 4x4 vehicle	• Elevated work platform and boom lift	• Hand tools, grinders, drill, welder, rattle gun
• Mobile crane (18t franna)	• 25t capacity excavator	• Grader
• Mobile crane (35t)	• D4 dozer	• Concrete agitator truck(s)
• Mobile crane (80t)	• 10t road roller	• Mobile welder
• Mobile crane (150t)	• Flat top truck	• Diesel welder/generator
• Concrete pump	• 10t tip truck	• Cable puller – winch
• 4t capacity tele-handler		

4.3 Justification

The proposed extension is needed to allow Boral to utilise more SWDFs in the cement manufacture process while adhering to the maximum 100,000 tpa limit prescribed under development consent.

Construction of the as approved SWDF shed would be uneconomical; therefore an extension to the ‘as built’ SWDF shed is sought to increase the storage capacity of the existing SWDF storage shed while keeping construction costs low. The proposed extension is also needed to allow Boral to use SWDF materials over weekend periods, where deliveries are not permitted, and a shortage of supply is experienced.

Doing nothing would mean continuing to use the SWDF storage shed and related feeding system as built, well below the currently approved storage capacity. With current delivery restrictions, this would continue to restrict the throughput of SWDFs to the facility to 55,000 tpa, far below the approved rate limit of 100,000 tpa. Boral would be forced to use a higher proportion of convention fuels such as coal and natural gas in Kiln 6 operations.

5. Legislative context

5.1 Environmental Planning and Assessment Act 1979

5.1.1 Modification approval pathway

Given the nature of the proposed modification, it is recommended that this modification be assessed pursuant to section 4.55 (1A) of the EP&A Act. The particulars of the relevant section are reproduced below.

(1A) Modifications involving minimal environmental impact

A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if:

(a) it is satisfied that the proposed modification is of minimal environmental impact, and
(b) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which the consent was originally granted and before that consent as originally granted was modified (if at all), and
(c) it has notified the application in accordance with:
  (i) the regulations, if the regulations so require, or
  (ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and
(d) it has considered any submissions made concerning the proposed modification within any period prescribed by the regulations or provided by the development control plan, as the case may be.

Subsections (1), (2) and (5) do not apply to such a modification.

5.1.2 Environmental impact

Environmental impacts associated with the proposed are minimal and are discussed in **Section 6**.

5.1.3 Substantially the same development

In order to draw a conclusion as to whether a proposal is substantially the same development as approved, a proponent must have regard to the following considerations which have been established through decisions of the NSWLEC:

1. *"Substantially" means "essentially or materially" or "having the same essence".*[1]

The proposed extensions to the existing SWDF shed would improve the effectiveness of the storage shed and would allow the facility to continue its campaigned use of SWDF in Kiln 6 operations. It would marginally increase the as-built storage capacity of shed (11%) and allow the facility to utilise the resource over weekend periods when SWDF replenishment cannot occur. Operational aspects of the SWDF storage, feeding, and handling system would not change as a result of the modification.

[1] Vacik Pty Limited v Penrith City Council (1992) NSWLEC 8

2. *A development can still be substantially the same even if the development as modified involves land that was not the subject of the original consent (provided that the consent authority is satisfied that the proposal is substantially the same).*[2]
3. *If the development as modified, involves an "additional and distinct land use", it is not substantially the same development.*[3]

The proposal does not involve an additional and distinct land use. The proposed extension would be wholly contained in lot 1 DP 1017008, which forms a part of the facility's project approval.

4. *Notwithstanding the above, development as modified would not necessarily be substantially the same solely because it was for precisely the same use as that for which consent was originally granted.*
5. *To determine whether something is ''substantially the same'' requires a comparative task between the whole development as originally approved and the development as proposed to be modified. In order for the proposal to be ''substantially the same'', the comparative task must:*
   (i) result in a finding that the modified development is ''essentially or materially'' the same;
   (ii) appreciate the qualitative and quantitative differences in their proper context; and

6. In addition to the physical difference, consider the environmental impacts of proposed Modification Applications to approved developments.[4,5]
7. The results of the comparative task ''does not eclipse or cause to be eclipsed a particular feature of the development, particularly if that feature is found to be important, material or essential."[6]

A comparative task has been undertaken at **Table 5.1**. The proposed development is considered to be complimentary to the existing development and would allow Boral to store and use a higher volume of SWDF in Kiln 6 operations, well within the limitations originally imposed.

The proposed development is therefore within the scope of Section 4.55 (1A) as the proposed development is of minimal environmental impact and is substantially the same development as the development from which consent was originally granted.

Table 5.1 Comparative task

	Approved (MOD 9)	Proposed (MOD 10)
Operations		
Cement production	1.56 million tonnes per annum	No change
Hours of operation	24 hours and day, 7 days a week.	No change
Site personnel	150	No change
Total truck movements per day	317	No change

[2] Scrap Realty Pty Limited v Botany Bay City Council [2008] NSWLEC 333
[3] Vacik Pty Limited v Penrith City Council (1992) NSWLEC 8

Table 5.1 Comparative task continued

	Approved (MOD 9)		Proposed (MOD 10)
SWDF			
SWDF delivery hours	*Monday - Friday*	6:00 am - 6:00 pm	No change
	Saturday	7:00 am – 1:00pm	
	Sundays and Public Holidays	No deliveries	
	Approved (MOD 9)		**Proposed (MOD 10)**
Total truck movements per day (SWDF deliveries)	*Monday - Friday*	40	No change
	Saturday	20	
SWDF storage capacity (m^3)	44,230		21,700
SWDF used in Kiln 6 operations (tpa)	Up to 100,000		No change
Environmental impacts			
Noise	Condition 3.3 requires the operator to design, construct, operate and maintain the facility and to not exceed maximum allowable noise contributions limits prescribed at Table 2.		No changes to operational process and associated impacts to noise and vibration proposed.
Traffic	Up to 317 trucks trips per day during the typical 12-hour working weekday and up to 100 truck trips per day during a typical 6-hour working Saturday.		No additional external truck movements would result
Air quality	Condition 3.7, 3.7A, 3.8, and 3.9 require the operator to maintain air quality mitigation measures and control dust emissions. Dust management is a requirement of EPL 1698. The facility conducts ambient air/dust monitoring		No change to operational practices/methods and associated impacts to air quality proposed.
Greenhouse Gas	No conditions relating to greenhouse gas emissions. The facility undertakes monitory of stack emissions.		No change intensification of process is proposed. No change to the maximum volume of SWDF used in a year.
Visual Impact	No visual amenity related conditions provided		Extension to SWDF shed would be screened by existing infrastructure, tree cover and surrounding landform.
Waste	Conditions 3.17, 3.17A, 3.17AB, 3.17AC, 3.17AD, 3.17AE, 3.17B, and 3.17C relate to waste		The proposed works would generate minimal construction waste which would be appropriately managed and removed.

6. Environmental assessment

6.1 Construction phase impacts

6.1.1 Noise and vibration

A Construction Noise Impact Assessment for the proposed development has been prepared and is included at **Appendix B**. The report finds that the noise levels from the construction of the project are predicted to be complaint with criteria at all residential receivers. Additionally, no impacts from vibration during construction works are expected.

6.1.2 Traffic

Construction of the proposed development would generate limited additional traffic and heavy vehicle movements and would be managed in accordance with the construction and traffic management plan and procedures. Traffic impacts associated with the construction of the extension to the shed are considered to be negligible given the relatively minor scale of the works, and short time frame in which additional vehicles would be required at the site.

Construction traffic would enter the site via the Taylor Avenue and Perth Street.

6.1.3 Air quality

The Project has the potential to generate dust emissions during construction from material handling, vehicle movements and windblown dust generated from exposed areas and stockpiles.

The potential dust impacts from these activities are difficult to accurately quantify as they are short in duration and sporadic.

It is unlikely that there would be any significant or prolonged air quality impact off-site as the construction activities would occur for a short period and appropriate dust mitigation measures would be implemented during construction. Furthermore the existing approval contains relevant dust mitigation measures which will be implemented to ensure no impacts will arise as a result of the proposed activities.

6.1.3 Waste

Site preparation activities would involve a minimal amount of earthworks with any surplus spoil being reused on site.

Due to the nature of the construction using prefabricated items, Construction waste would be minimal and will be managed in accordance with the contractor's construction management plan with a requirement to minimize waste generation through avoidance, reuse and recycling, with appropriate segregation, and disposal of residual waste to appropriate offsite licensed facilities.

6.2 Operational phase impacts

6.2.1 Noise

Potential noise impacts from operation of the SWDF shed and related feeding system were modelled and assessed under the Noise and Vibration Impact Assessment in support of Mod 9[4].

[4] SLR Consulting Australia, Berrima Cement Modification No. 9 – Waste Derived Fuels Noise and Vibration

Operational noise targets limits for the facility are contained at DA 401-11-2002 condition 3.3 and are reproduced in **Table 6.3**.

Table 6.3 Operational noise targets

Receiver Location	Day[a] $L_{Aeq(15\ minute)}$	Evening[b] $L_{Aeq(15\ minute)}$	Night[c] $L_{Aeq(15\ minute)}$
4 Melbourne Street	37	37	37
Chelsey Park Farm	30	30	30
Candowie Farm	37	37	37

The assessment's noise modelling had found that operational noise associated with the operation of the SWDF storage, feeding, and handling system would cause a minimal impact on the total noise emissions from the operation of Kiln 6 (less than 1 dB).

As there is no change to operational plant and equipment, processes, frequency of deliveries, or maximum SWDF above 100,000 tpa, no additional impact noise would result.

6.2.2 Traffic

Traffic impact impacts associated with the SWDF project were assessed under a Traffic Impact Assessment (TIA) in support of Mod 9[5]. As part of the original assessment, it was determined that delivery of up to 100,000 tpa of SWDF as a substitute for conventional fuel would result in a marginal increase in additional truck movements.

Waste fuel is currently delivered to the facility by truck and dog trailer, walking floor trailers, flatbed trucks (for bales, or B-Double trucks with a 24 tonne payload capacity) via similar ruck routes as cement work trucks.

It is not proposed to increase the use of SWDF in Kiln 6 operations beyond the current limit of 100,000 tpa, and therefore no additional truck movements would result from the proposed development.

6.2.3 Air quality

Potential air quality impacts associated with the construction and operation of the SWDF storage shed and feeding system were assessed under an Air Quality Impact Assessment in support of Mod 9[6]. The methodology used to carry out this air impact assessment is in accordance with NSW EPA's *"Approved Methods for the Modeling and Assessment of Air Pollutants in NSW (2005)".*

Dispersion modeling was carried out to predict ambient concentrations of pollutants discharged from the facility when burning SWDFs. Pollutants included in the modelling included TSP, PM_{10}, $PM_{2.5}$, NO_2, SO_2, NMHC, dioxins, PAHs, heavy metals, halides, and sulfuric acid mist. Fugitive dust emissions from raw material stockpiling and handling and odour emissions associated with the SWDF storage shed was also considered.

The modelling found that, with the exception of 24-hour average PM10, all pollutants the maximum applicable ground level concentrations were lower than the relevant ambient air assessment threshold limits.

Assessment, January 2015

[5] Traffix, Traffic Impact Assessment Kiln 6 Upgrade Modification 9 Berrima Cement Works, November 2014

[6] Air Quality Professionals, Boral Cement Berrima Works Use of Solid Waste Derived Fuels in Kiln 6 Air Quality Impact Assessment, April 24 2015

It was determined that exceedances with respect to 24-hour average PM10 were dependent entirely on the magnitude of fugitive dust concentrations which are considered to be over-estimates of the actual maximum incremental ground level concentrations at receptors close to the site boundary due to assumptions required for the fugitive dust dispersion analysis.

Boral operates an ambient air quality monitoring station (AQMS) beyond the site boundary. The AQMS records data for Total Suspended Particulates (TSP), PM_{10} and heavy metals. The results of this ambient monitoring data are contained at **Appendix C**.

The facility is generally compliant with the adopted guideline values with the exception of exceedances in December 2017 owing to off-site construction activities associated with the excavation for a new bridge over the railway line during this period.

The proposed modification seeks only to extend the current SWDF storage shed allowing for additional SWDF storage at any one time. It is not proposed to increase the use of SWDF in Kiln 6 operations beyond the current limit of 100,000 tpa. It can therefore be concluded that there would be no effective change to off-site local air quality impacts as a result of the proposed development.

6.2.4 Greenhouse gas

A greenhouse gas assessment was undertaken in support of the preceding Mod 9 application[7]. The assessment had determined Scope 1, 2 and key Scope 3 GHG emission estimates for the operation of the Project, and had found that emissions associated with the burning of SWDF was less than that of conventional fuel use.

It is not proposed to increase the use of SWDF in Kiln 6 operations beyond the current limit of 100,000 tpa. The proposed modification will have an impact on greenhouse gas emissions out of the facility.

6.2.5 Visual impact

The as-built SWDF storage shed is well screened from residential dwellings and public spaces by local undulating landforms and tree cover within the facility and across portions of the landscape surrounding the facility.

The proposed extension would extend the as built SWDF storage shed 24 meters to the north toward the existing pre-heat tower (see **Figure 6.2**). This area is well screened to sensitive receptors.

[7] SLR Consulting Australia, Berrima Cement Works Mod 9 Greenhouse Gas Assessment, January 2015

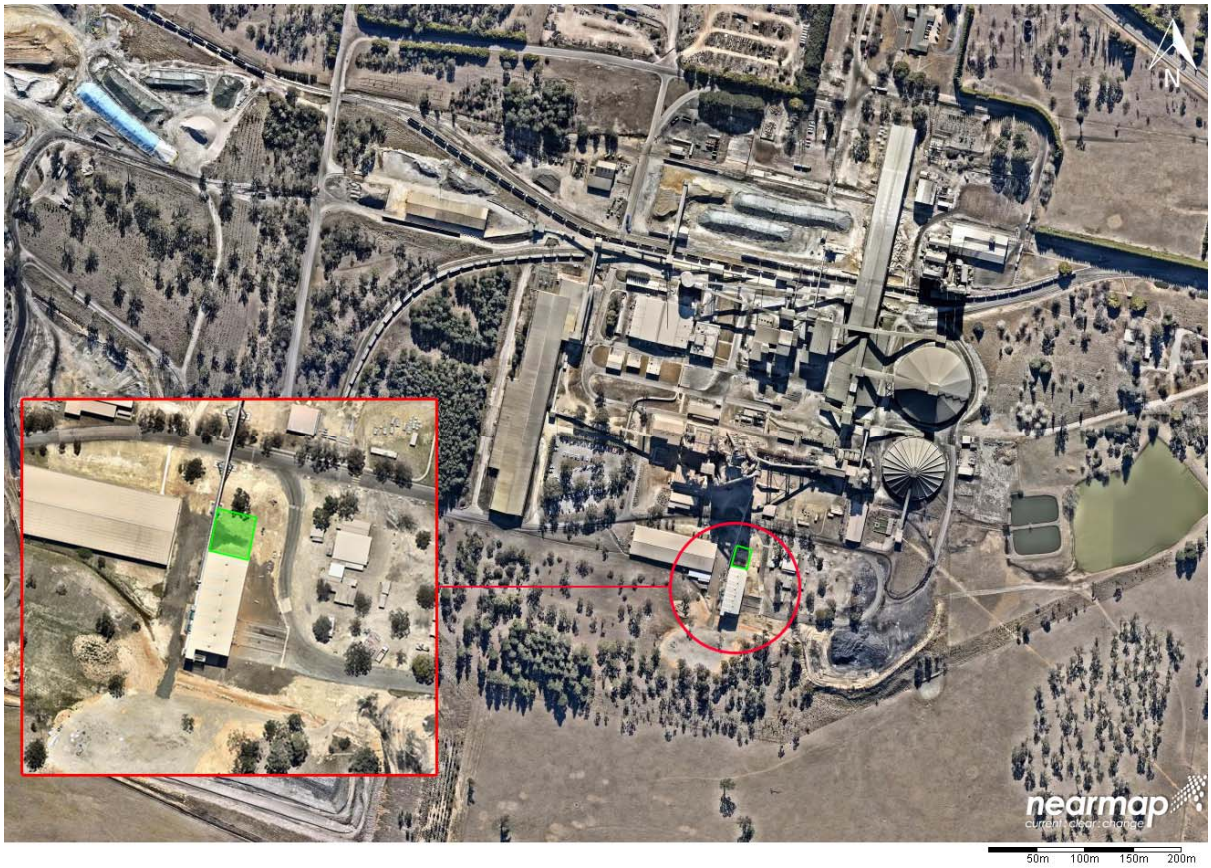


Figure 6.2 Proposed shed extension

7. Consultation

At an annual community meeting held on 6 December 2018, Boral employees reported to the community the status of ongoing activities at the site, and reported-back to residents on the commissioning of SWDF in Kiln 6 operations. The meeting was used to introduce and foreshadow future changes to Boral's operations at the Berrima Cement Works, including the proposed infrastructure changes to the existing SWDF storage shed. The project was generally well-met with no issues or concerns raised at the time.

The proposed modification was also introduced to the DPE on 18 October 2018 and again in February 2019 over the phone. Boral's representative provided a brief description of the proposed modification and confirmed DPE's requirements for assessment.

Given the relatively minor nature of the modification, seeking to extend an already existing shed structure, set back a significant distance from any potential sensitive receivers, further consultation was not considered to be necessary.

8. Conclusion

This SEE has been prepared in accordance with Part 4 of the EP&A Act to support a modification application by Boral for specification and design changes to the approved SWDF storage shed.

This SEE has described the site, its environs, the proposal, and provides an assessment of the relevant matters of consideration under section 4.55 (1A) of the Act.

This proposed modification is justified on economic, social and environmental grounds and is consistent with the objectives of the EP&A Act.

The proposed modification would not result in significant environmental impacts to the local road network or nearby sensitive receivers.

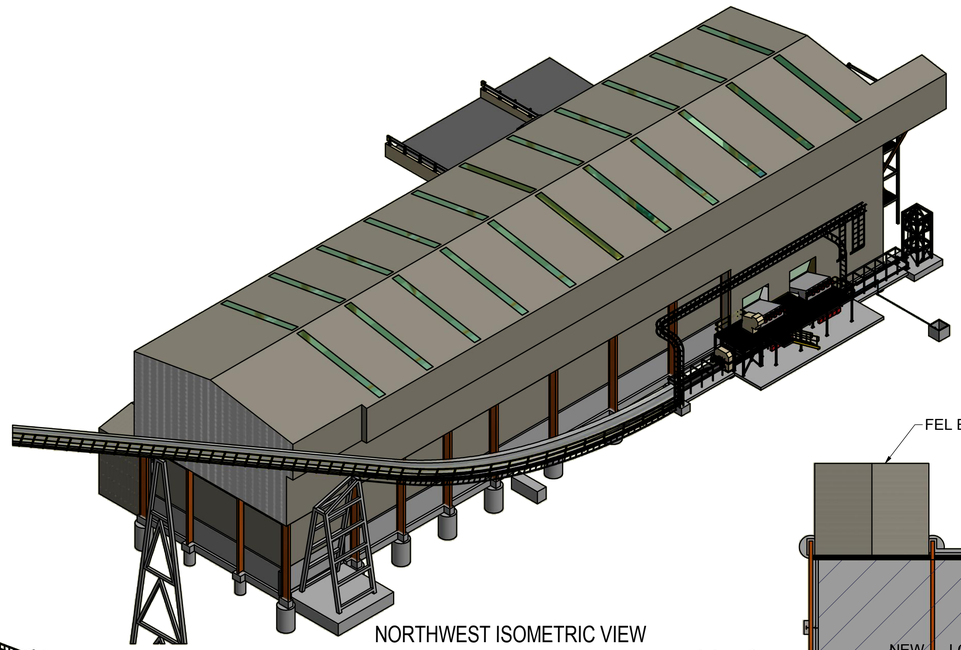
The proposal is considered to be in the public interest as it would allow for the continued effective operation of the Berrima Cement Works, a key industrial facility supporting direct workforce of up to 150 employees, and optimize the utilization of WDF through existing operations.

In light of the above, Boral recommends that the consent authority approve the proposal.

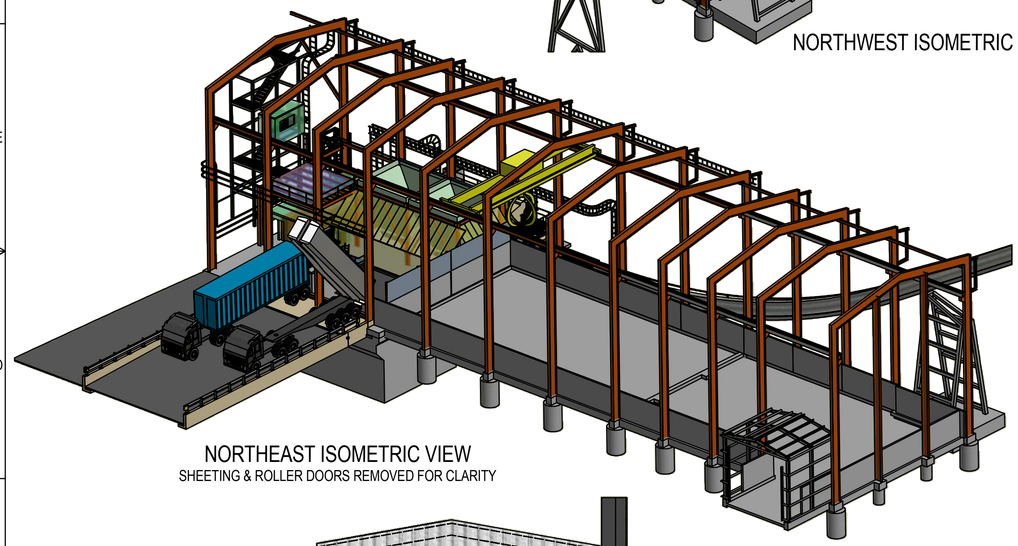
Appendix A

Proposed SWDF shed extension - General Arrangement

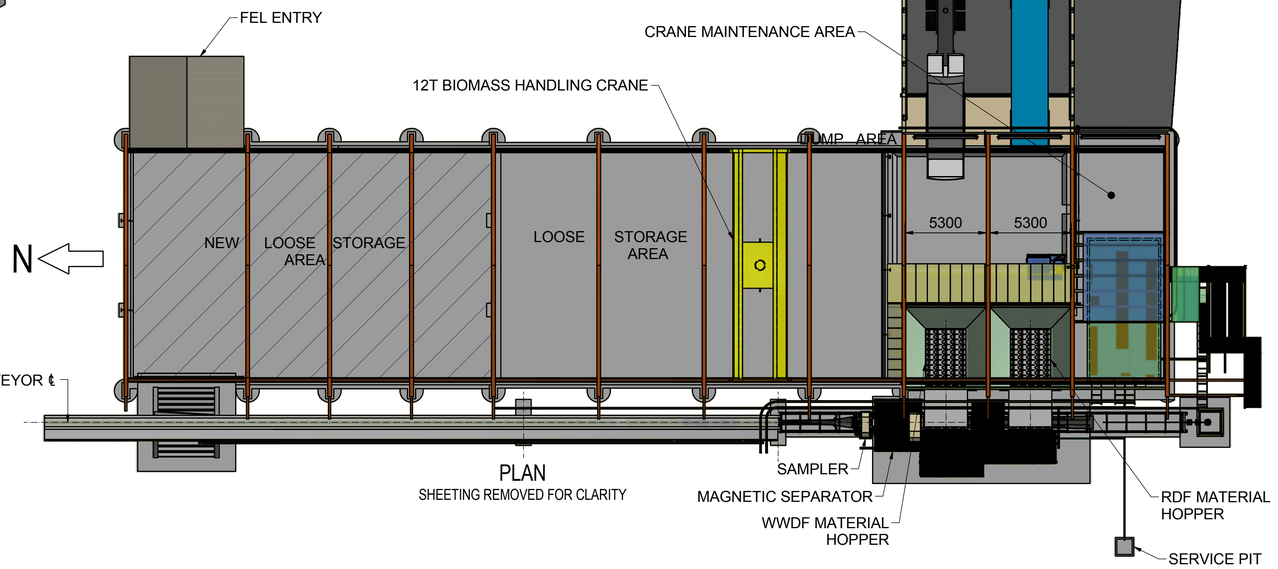
REFERENCE DRAWINGS	
DRAWING	DESCRIPTION
GE-B-2315-01	SOLID WASTE FUELS - SITE CIVIL LAYOUT
GE-B-2315-02	SOLID WASTE FUELS - CIVIL SECTIONS & TRENCHES
GE-B-2276-01	SOLID WASTE FUELS - MFD
GE-B-2341-01	SOLID WASTE FUELS - ELEVATION LOOKING WEST
GE-B-2342-01	SOLID WASTE FUELS - ELEVATION LOOKING NORTH
GE-B-2350-01	WASTE RECEIVAL SHED FLOOR LAYOUT
GE-B-2350-02	WASTE RECEIVAL SHED CIVIL LAYOUT
GE-B-2382-01	WASTE RECEIVAL SHED - INTERNAL SWITCHROOM
GE-B-2382-02	WASTE RECEIVAL SHED - SWITCHROOM TRENCHES



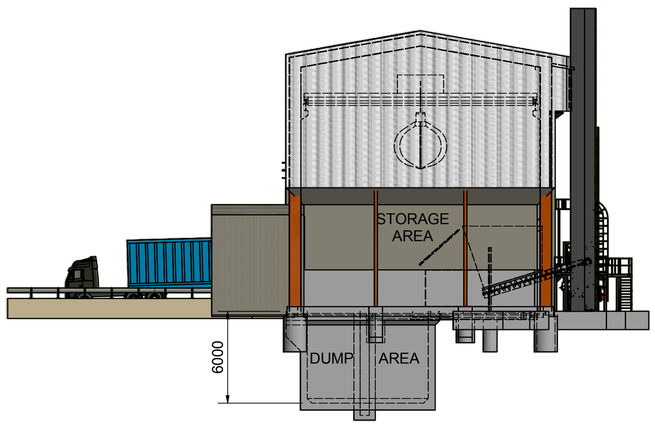
NORTHWEST ISOMETRIC VIEW



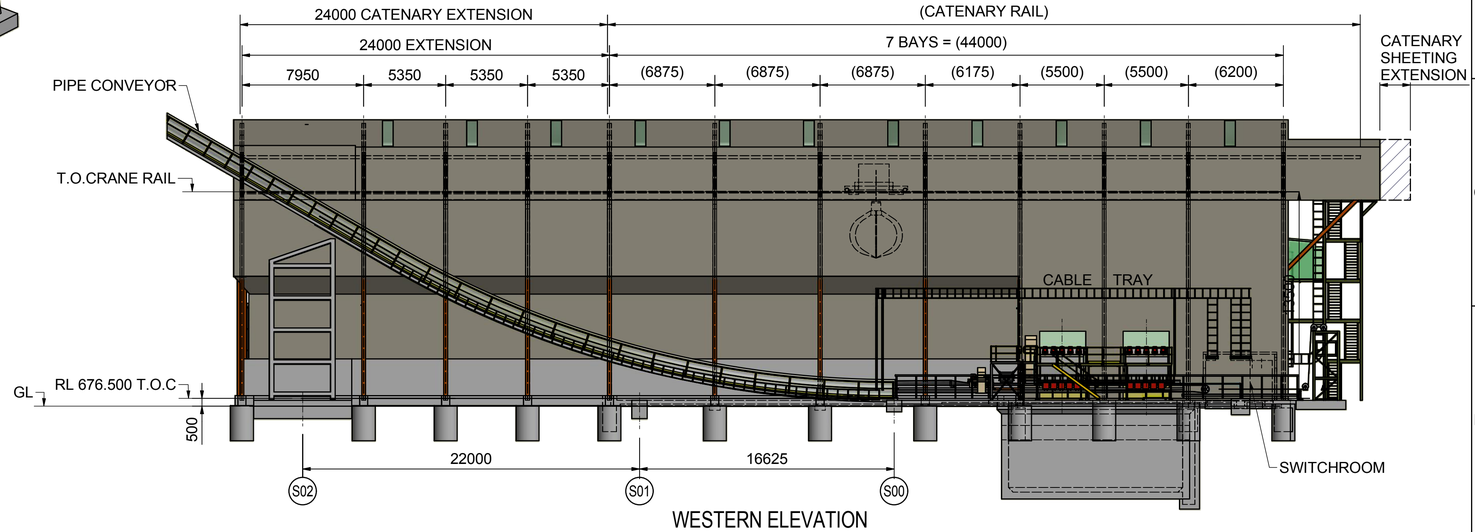
NORTHEAST ISOMETRIC VIEW
SHEETING & ROLLER DOORS REMOVED FOR CLARITY



PLAN
SHEETING REMOVED FOR CLARITY



NORTHERN ELEVATION



WESTERN ELEVATION

REV	DATE	DESIGNER	APPROVED	DESCRIPTION
A	04/10/2018	L.P.McIntosh		DRAWING ISSUED FOR COMMENT.

REVISION HISTORY

DRAWN: L.P.McIntosh	DATE: 21/07/2015		
CHECKED:	DATE:		
ENGINEER:	DATE:		
APPROVED:	DATE:		

Boral Cement
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Engineering Services
Locked Bag No. 4 New Berrima N.S.W. 2577 Australia
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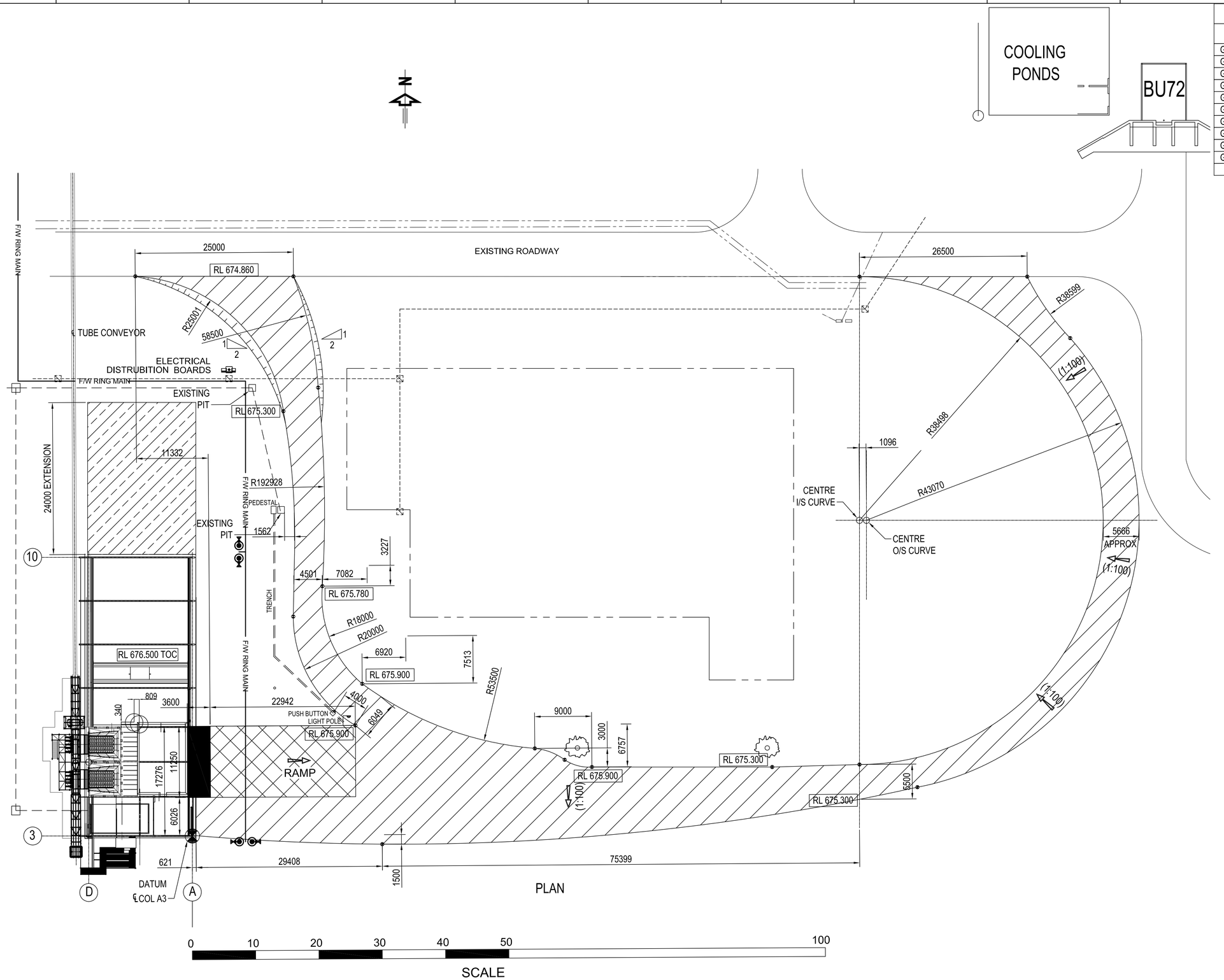
STATUS: PRELIMINARY			
ALPHA NUMERIC: BU113		BCES JOB No: GBM452	
STOCK NUMBER:	SHEET: A1	SCALE: 1:200 1:250	

PLANT:	BERRIMA
PROJECT:	SOLID WASTE FUELS
SECTION:	KILN No.6
SUB SECTION:	PREHEATER
TITLE:	WASTE RECEIVAL SHED PROPOSED EXTENSION 2018
CLASSIFICATION:	GENERAL ARRANGEMENT

GROUP ENGINEERING No: PLANT	DRAWING	SHEET
	GE-B-2425-01rA	
WORKS No:		REV. A

REFERENCE DRAWINGS

DRAWING	DESCRIPTION
GE-B-2315-01	SOLID WASTE FUELS - CIVIL LAYOUT
GE-B-2315-02	SOLID WASTE FUELS - CIVIL SECTIONS & TRENCHES
GE-B-2315-03	SOLID WASTE FUELS - CIVIL LAYOUT - SURVEY
GE-B-2276-01	SOLID WASTE FUELS - MFD
GE-B-2341-01	SOLID WASTE FUELS - ELEVATION LOOKING WEST
GE-B-2342-01	SOLID WASTE FUELS - ELEVATION LOOKING NORTH
GE-B-2339-01	WASTE RECEIVAL SHED & CRANE GA
GE-B-2350-01	WASTE RECEIVAL SHED FLOOR LAYOUT
GE-B-2350-02	WASTE RECEIVAL SHED CIVIL LAYOUT
GE-B-2382-01	WASTE RECEIVAL SHED - INTERNAL SWITCHROOM



LEGEND

- ELECTRICAL
- 600 W & 800 W □ NEW ELECTRICAL PIT
- AREA OF 2 COAT SPRAY SEAL 2534 M²
- AREA SURFACE AC2 258 M²
- AREA SURFACE CONCRETE 40 M²
- NEW SHED EXTENSION
- ROAD FALL
- 1 / 2 ROAD BATTER

0 10 20 30 40 50 100

SCALE

REV.	DATE	REV-BY	APPROVED	REVISION
F	8-2-19	L.P.McIntosh		DRAWING REVISED. 24M EXTENSION ADDED.
E	27-4-18	L.P.McIntosh		DRAWING REVISED. ROAD REALIGNED.
D	17-4-18	L.P.McIntosh		DRAWING REVISED. ROAD LEVELS & FALL ADDED.
C	12-4-18	L.P.McIntosh		DRAWING REVISED. DIMENSIONS ADDED. SURFACING REVISED.
B	15-2-18	L.P.McIntosh		ROAD REVISED.
A	19-1-18	L.P.McIntosh		DRAWING ISSUED FOR COMMENT

REVISIONS

DRAWN: L.P.McIntosh DATE: 19-1-18
CHECKED: DATE:
ENGINEER: DATE:
APPROVED: DATE:

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STATUS: PRELIMINARY

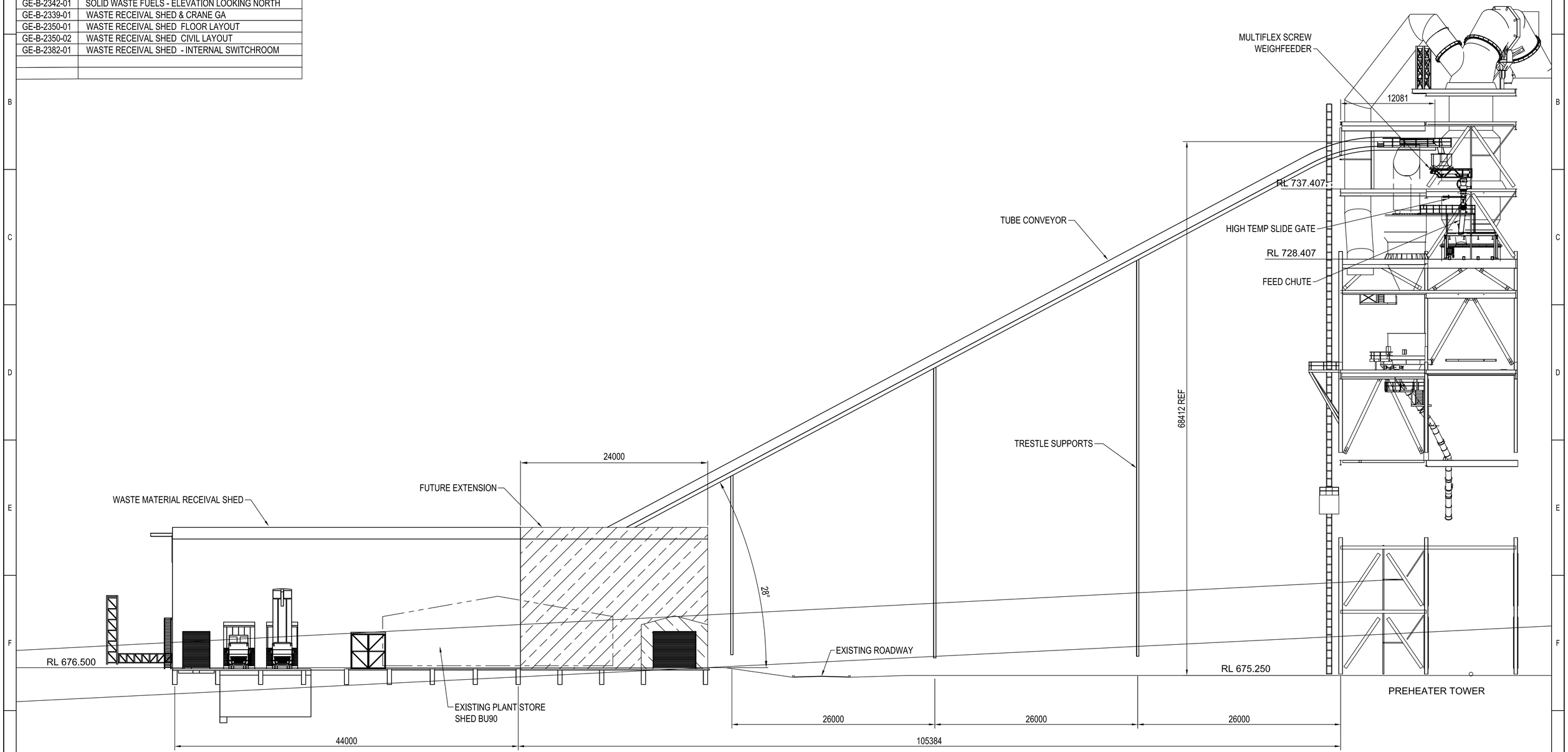
ALPHA NUMERIC:
BCSC-GES JOB No: GBM452
STOCK NUMBER
SHEET: A1
SCALE: NTS

PLANT: BERRIMA
PROJECT: SOLID WASTE FUELS
SECTION: KILN No6
SUB SECTION: PREHEATER
TITLE: ROADWORKS
CLASSIFICATION: LAYOUT

GROUP ENGINEERING No: PLANT GE-B - DRAWING 2315 - SHEET 09
WORKS No:
REV. F

REFERENCE DRAWINGS

DRAWING	DESCRIPTION
GE-B-2315-01	SOLID WASTE FUELS - SITE CIVIL LAYOUT
GE-B-2315-02	SOLID WASTE FUELS - CIVIL SECTIONS & TRENCHES
GE-B-2276-01	SOLID WASTE FUELS - MFD
GE-B-2340-01	SOLID WASTE FUELS - SITE PLAN
GE-B-2342-01	SOLID WASTE FUELS - ELEVATION LOOKING NORTH
GE-B-2339-01	WASTE RECEIVAL SHED & CRANE GA
GE-B-2350-01	WASTE RECEIVAL SHED FLOOR LAYOUT
GE-B-2350-02	WASTE RECEIVAL SHED CIVIL LAYOUT
GE-B-2382-01	WASTE RECEIVAL SHED - INTERNAL SWITCHROOM



ELEVATION LOOKING WEST

REV.	DATE	REV-BY	APPROVED	REVISION
E	8-2-19	L.P.McIntosh		DRAWING REVISED. 24M EXTENSION ADDED.
D	16-1-17	L.P.McIntosh		DRAWING REVISED. RECEIVAL SHED REDUCED.
C	28-10-16	L.P.McIntosh		DRWING REVISED. SINGLE FEED CHUTE TO CALCINER & MULTIFLEX SCREW WEIGHFEEDER ADDED.
B	31-5-16	L.P.McIntosh		DRAWING REVISED.SHED MODIFICATION 2016
A	23-7-15	L.P.McIntosh		DRAWING ISSUED FOR COMMENT

REVISIONS

DRAWN:	L.P.McIntosh	DATE: 23-7-15
CHECKED:		DATE:
ENGINEER:		DATE:
APPROVED:		DATE:

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STATUS: PRELIMINARY

ALPHA NUMERIC:

BCSC-GES JOB No: GBM452

STOCK NUMBER

SHEET: A1 SCALE: NTS

PLANT: BERRIMA
PROJECT: SOLID WASTE FUELS
SECTION: KILN No6
SUB SECTION: PREHEATER
TITLE: MATERIAL SHED SITE - ELEVATION LOOKING WEST
CLASSIFICATION: GENERAL ARRANGEMENT

GROUP ENGINEERING No: PLANT GE-B- DRAWING 2341 - SHEET 01

WORKS No:

REV. E

Appendix B

SLR – Construction Noise Impact Assessment

Memorandum

To:	ADNAN VOLODER	**At:**	Boral Cement Limited
From:	David O'Brien	**At:**	SLR Consulting Australia Pty Ltd
Date:	6 February 2019	**Ref:**	610.18553-M01-v1.0.docx
Subject:	Berrima Cement Works Modification Construction Noise Impact Assessment		

1 Introduction

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Boral Cement Limited (Boral) to complete a Construction Noise Impact Assessment for construction works relating to a modification (MOD 9) of an existing Solid Waste Derived Fuel (SWDF).

SLR previously completed a Noise and Vibration Impact Assessment (Report Number 610.14460-R3 – dated 15 January 2015) for the construction of the SWDF storage shed and use of waste derived fuels in Kiln 6 Operations

This memorandum is an addendum of the previous assessment for inclusion into an Environmental Impact Statement.

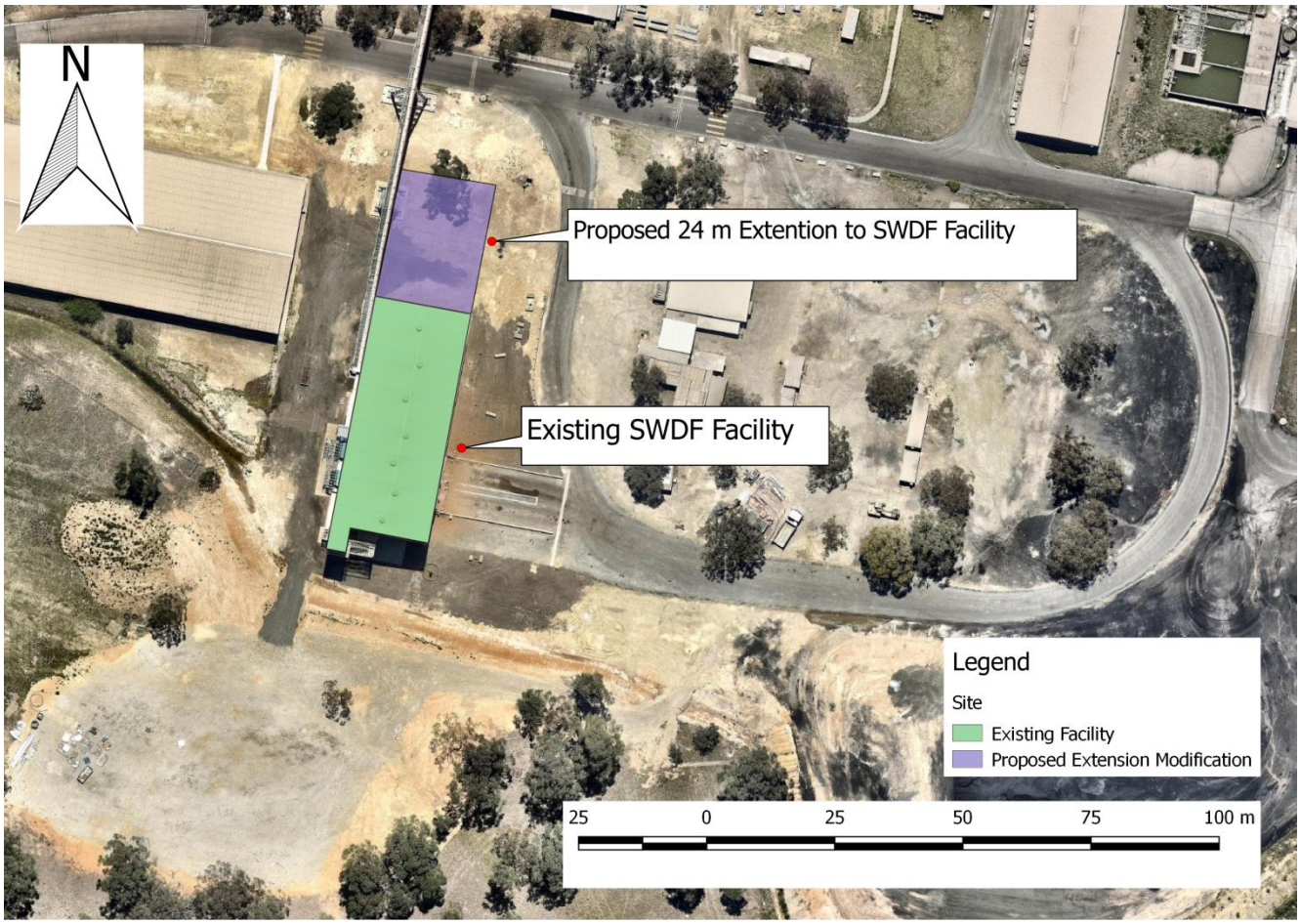
2 Project Description

The proposed modification would increase the storage capacity of the existing SWDF storage shed. This would include:

- Extension of the existing SWDF storage shed by approximately 24 m north
- Sundry improvements to the existing SWDF including a minor extension to vehicle access doors to improve vehicle access and manoeuvrability.

The location of the existing facility and proposed extension is illustrated below in **Figure 1**.

Figure 1 Site Overview and Extension Location



2.1 Sensitive Receivers

The nearest sensitive receivers are residential receivers along Melbourne Street, located around 800 m to the north of the facility. Residential areas are also located further to the north east and south east at a distance of around 1 km.

The nearest receivers are shown in **Figure 2** with details of the nearest potentially affected sensitive receivers in **Table 1**.

Table 1 Summary of Sensitive Receivers

ID	Address	Type	Distance (m)	Direction
R01	Melbourne St	Residential	800	N
R02	Chesely Park Farm	Residential	1,000	NE
R03	Candowie Farm	Residential	1,000	SE

Figure 2 Site Location and Nearest Sensitive Receivers

3 Assessment Criteria

3.1 Interim Construction Noise Guideline

The NSW *Interim Construction Noise Guideline* (ICNG) is used to assess and manage impacts from construction noise on residences and other sensitive land uses in NSW.

The ICNG requires project specific Noise Management Levels (NMLs) to be established for sensitive receivers based on the existing background noise in the area.

The NMLs are not mandatory limits, however where construction noise levels are predicted or measured to be above the NMLs, feasible and reasonable work practices to minimise noise emissions are to be investigated.

Table 2 Residential Noise Management Levels for Residential Receivers

Time of Day	NML $L_{Aeq(15minute)}$	How to Apply
Standard hours Monday to Friday 7:00 am to 6:00 pm Saturday 8:00 am to 1:00 pm No work on Sundays or public holidays	RBL + 10 dB	• The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq(15minute)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practises to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.

	Highly Noise Affected
	75 dBA
		• The Highly Noise Affected (HNA) level represents the point above which there may be strong community reaction to noise.
		• Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restructuring the hours that the very noisy activities can occur, taking into account:
		  ◦ Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools or mid-morning or mid-afternoon for works near residences.
		  ◦ If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Outside recommended standard hours	RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practises have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.

3.2 Construction Vibration

Minimum working distances for typical vibration intensive construction equipment are provided in **Table 3**.

The minimum working distances are quoted for both cosmetic damage (see *BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2*, BSI, 1993) and human comfort (see the NSW EPA *Assessing Vibration: a technical guideline*, DEC, 2006) and are based on empirical data which suggests that where works are further from receivers than the quoted minimum distances then impacts are not considered likely.

Table 3 CNVG Recommended Minimum Working Distances from Vibration Intensive Equipment

Plant Item	Rating/Description	Minimum Distance	
		Cosmetic Damage (BS 7385)	Human Response (NSW EPA Guideline)
Vibratory Roller	1-2 tonne	5 m	15 m to 20 m
	2-4 tonne	6 m	20 m
	4-6 tonne	12 m	40 m
	7-13 tonne	15 m	100 m
	13-18 tonne	20 m	100 m
	>18 tonne	25 m	100 m
Small Hydraulic Hammer	300 kg (5 to 12 t excavator)	2 m	7 m
Medium Hydraulic Hammer	900 kg (12 to 18 t excavator)	7 m	23 m
Large Hydraulic Hammer	1,600 kg (18 to 34 t excavator)	22 m	73 m
Piling Rig – Bored	≤ 800 mm	2 m (nominal)	4 m
Jackhammer	Hand held	1 m (nominal)	2 m

Note 1: Taken from the Roads and Maritime *Construction Noise and Vibration Guideline*.

Note 2: More stringent conditions may apply to heritage or other sensitive structures.

The minimum working distances are indicative and will vary depending on the particular item of equipment and local geotechnical conditions. The distances apply to cosmetic damage of typical buildings under typical geotechnical conditions.

4 Construction Impact Assessment

4.1 Noise Assessment

This assessment has used background noise monitoring data and criteria as specified in the previous acoustic assessment completed in January 2015.

4.1.1 Construction Scenarios and Associated Equipment

The construction scenarios presented in **Table 4.** Sound data is taken from the SLR noise data base, previous measurements, standards, supplier data and noise libraries.

Table 4 Construction Scenarios and Equipment Noise Levels (Sound Power Level, dBA)

Works Number	Scenario Name	Equipment	Number of Equipment	On-Time (15 min)	Individual Corrected SWL LAeq	Works SWL LAeq
W.0001	Site Establishment	Truck	1	5	102	103
		Generator (small)	1	15	93	
		Hand Tools	1	15	94	
W.0002	Earth Works	Excavator (22 tonne)	1	7.5	96	116
		Dozer	1	15	114	
		Grader	1	15	108	
		Truck	1	5	102	
		Tipper Truck	1	15	97	
		Roller - Smooth Drum	1	15	107	
		Generator (small)	1	15	93	
W.0003	Concrete Works	Concrete Pump	1	7.5	103	106
		Concrete Mixer Truck	1	7.5	100	
		Mobile Crane (100 tonne)	1	15	100	
		Generator (small)	1	15	93	
W.0004	Crane Works	Mobile Crane (100 tonne)	1	15	100	103
		Elevated Working Platform	1	15	97	
		Welding Equipment	1	15	97	
		Generator (small)	1	15	93	
W.0005	Traffic Movements	Truck	2	5	102	105

4.1.2 Working Hours

The works would be undertaken during the standard construction hours of:

- 7.00 am to 6.00 pm Monday to Friday
- 8.00 am to 1.00 pm on Saturdays

- No work on Public Holidays.

It is not expected that there would be any requirement for works during evening or night-time periods.

4.1.3 Noise Predictions

Noise predictions from the construction works have been predicted to the nearest receivers during the daytime and are summarised below in **Table 5**.

The results represent the worst-case noise levels where all equipment in each scenario is working concurrently. For most construction activities, it is expected that the construction noise levels would frequently be lower than predicted.

Table 5 Predicted Daytime Construction Noise Levels

Construction Scenario	Receiver	Noise Level $L_{Aeq(15minute)}$ dB(A)		
		Daytime NML[1]	Predicted Level	Exceedance
W.001 Site Establishment	R.01 Melbourne St	40	26	-
	R.02 Chesely Park Farm		25	-
	R.03 Candowie Farm		20	-
W.002 Earth Works	R.01 Melbourne St	40	37	-
	R.02 Chesely Park Farm		36	-
	R.03 Candowie Farm		31	-
W.003 Concrete Works	R.01 Melbourne St	40	29	-
	R.02 Chesely Park Farm		28	-
	R.03 Candowie Farm		23	-
W.004 Crane Works	R.01 Melbourne St	40	26	-
	R.02 Chesely Park Farm		25	-
	R.03 Candowie Farm		20	-
W.005 Traffic Movements	R.01 Melbourne St	40	34	-
	R.02 Chesely Park Farm		21	-
	R.03 Candowie Farm		19	-

Note 1 Noise Management Levels have been taken from information outlined in the previous acoustic assessment (SLR Report 610.14460-R3).

The above shows the following:

- The noise levels from the construction of the project are predicted to be compliant with criteria at all receivers. This is mostly due to the distance of the receivers from the site and that highly noise intensive equipment is not proposed to be used.

4.2 Vibration Assessment

The major potential sources of vibration from the proposed construction activities would include excavators and drum rollers during earth works.

The nearest receivers to the site are located around 800 m to the north. As such, the minimum working distances for human comfort and building damage shown in **Section 3.2** are expected to be complied with at all times.

4.3 Construction Traffic

The requirements for construction traffic accessing the site would be minimal and would not be expected to result in any additional noise impacts at the nearest receivers due to the roads in the area being major routes with high existing volumes of traffic.

4.4 Mitigation

While the works are predicted to be compliant with the noise goals, it is recommended that the contractor adopt best-practice mitigation measures, where possible.

The recommended standard construction migitaion measures are shown in **Table 6**.

Table 6 Recommended Mitigation Measures

Project stage	Measure
Scheduling	Where ever possible, highly noisy intensive works should only be undertaken during the following hours, unless otherwise assessed and justified: - 7 am to 6 pm Mondays to Fridays, inclusive; and - 8 am to 1 pm Saturdays; and - at no time on Sundays or public holidays.
	Provide respite periods when noisy works are undertaken outside standard hours of construction or during periods where high noise impacts are likely.
	Avoid loading and unloading of materials / deliveries outside of daytime hours.
Site Layout	Site entry and exit points should be located as far as possible from sensitive receivers.
	Compounds and work areas should be designed to as one-way to minimise the need for vehicles to reverse.
	Work compounds, parking areas, equipment and stockpiles should be positioned away from noise-sensitive locations and/or in shielded locations.
	Trucks should not idle near to residential receivers.
	Stationary sources of noise, such as generators, should be located away from sensitive receivers.
Contractor management	Training should be provided to project personnel, including relevant sub-contractors, on noise and vibration requirements and the location of sensitive receivers during inductions and toolbox talks.
	Delivery vehicles should be fitted with straps rather than chains for unloading, wherever possible.
	Truck drivers should avoid compression braking as far as practicable.
	Where night-time works are required, trucks should use broadband reversing alarms.

Project stage	Measure
Noise source mitigation	Use the minimum sized equipment necessary to complete the work and where possible, use alternative, low-impact construction techniques.
	Power tools should use mains power where possible rather than generators.
	Shut down machinery, including generators, when not in operation.
	Avoid dropping materials from a height and dampen or line metal trays, as necessary.
	Ensure equipment is operated in the correct manner.
	All equipment should be appropriately maintained and fitted with noise control devices, where practicable, including acoustic lining of engine bays and air intake / discharge silencers, etc.
	Use residential-grade mufflers on equipment.
	Where possible, use dampened 'city' bits on jackhammers and rockbreakers.
Community consultation	Provide signage detailing the works being undertaken and a 24 hour contact number.
	Where there are complaints regarding noise, review and implement additional control measures, where feasible and reasonable.
Monitoring	Conduct noise and/or vibration monitoring in response to any complaints received.

5 Conclusion

A Noise and Vibration Impact Assessment has been completed for a modification of an existing Solid Waste Derived Fuels facility.

The proposed extension would be constructed adjacent to the existing facility. Construction works anticipated to be undertaken include site establishment works, earthworks, crane works, concrete works and truck movements.

Predictions from the proposed construction works have been made to the nearest sensitive receivers. No exceedances of the goals is expected which is due to the receivers being located at significant distance from the works.

Similarly, no impacts from vibration during construction works are expected.

Checked/
Authorised by: AW

Appendix C

POELA EPA Monitoring data - Berrima Cement

Boral Cement Berrima - POELA Act 2011 Monitoring Data

New Berrima, NSW - Environmental Protection Licence No. 1698

Record updated on: 08 January 2019

1. Stack emission monitoring (Standard Fuels)

1.1 Continuous Monitoring

Solid Particles Concentration (milligrams per cubic metre)

Licence limit: 50 milligrams per cubic metre; based on 24 hours averaging period

Date published	08/02/18	08/03/18	08/04/18	08/05/18	08/06/18	08/07/18
Date	**Jan-18**	**Feb-18**	**Mar-18**	**Apr-18**	**May-18**	**June-18**
1	28.6	0.0	0.0	15.9	26.0	10.2
2	30.2	0.0	0.0	15.9	17.2	11.3
3	35.2	0.0	16.5	13.6	13.1	13.2
4	40.8	0.3	27.2	17.9	12.5	16.6
5	40.4	1.9	26.2	18.4	12.0	15.1
6	39.4	21.2	18.0	20.4	11.4	13.7
7	41.5	18.8	12.7	27.1	11.6	11.1
8	38.5	17.8	9.2	37.0	13.3	12.7
9	36.5	18.3	10.0	29.7	20.8	13.9
10	43.2	20.9	11.2	11.4	15.2	13.1
11	32.9	19.1	12.9	11.0	16.5	13.3
12	0.0	15.2	15.4	10.7	14.7	15.3
13	0.0	16.3	16.7	10.5	13.4	15.0
14	0.0	18.3	16.4	10.2	13.0	15.9
15	0.0	18.3	15.7	12.7	12.2	14.9
16	0.0	14.9	12.9	14.8	13.3	14.5
17	0.0	15.5	16.0	14.4	18.0	15.2
18	0.0	15.0	17.6	11.8	18.9	14.9
19	0.0	14.7	16.8	16.4	18.4	15.0
20	0.0	15.9	14.7	16.3	16.3	21.3
21	0.0	16.7	15.2	17.1	16.6	27.7
22	0.0	17.2	15.7	17.8	16.6	22.7
23	0.0	17.2	15.4	21.1	16.3	35.2
24	0.0	16.2	14.8	20.0	15.3	29.8
25	0.0	0.0	15.0	18.9	13.7	20.2
26	0.0	0.0	15.0	20.4	13.1	39.2
27	0.0	0.0	17.3	20.8	14.1	29.8
28	0.0	0.0	27.7	22.1	13.7	20.5
29	0.0	x	15.4	23.7	13.5	18.4
30	0.0	x	15.7	24.8	12.9	21.1
31	0	x	16	x	10.9	10.2

Date published	08/08/18	08/09/18	08/10/18	08/11/18	08/12/18	08/01/19	
Date	**July-18**	**Aug-18**	**Sep-18**	**Oct-18**	**Nov-18**	**Dec-18**	
1	19.4	21.9	18.3	20.7	13.1	0.0	
2	17.2	24.5	21.3	16.3	11.4	0.0	
3	17.3	17.3	18.9	14.2	11.2	8.9	
4	0.0	19.3	21.2	13.8	12.8	8.0	
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6	0.0	23.2	11.5	9.7	13.3	8.9	
7	16.5	23.6	0.0	10.3	12.5	11.2	
8	17.5	17.3	0.0	10.4	14.7	9.4	
9	15.6	23.0	0.0	10.7	13.2	12.2	
10	16.1	21.8	18.9	15.3	9.1	25.7	
11	15.8	23.2	19.5	15.8	8.3	45.7	
12	17.5	26.5	19.5	19.3	11.2	39.7	
13	17.5	26.6	19.5	15.3	0.0	22.5	
14	12.9	23.3	19.5	14.6	12.3	27.1	
15	10.6	27.4	0.0	12.1	13.2	21.4	
16	11.1	29.4	0.0	11.4	12.5	24.1	
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18	17.4	19.0	16.7	20.5	18.1	0.0	
19	15.3	18.7	18.4	18.9	31.5	0.0	
20	15.2	17.5	22.9	0.0	18.7	23.3	
21	16.1	20.4	26.9	0.0	10.7	18.7	
22	15.7	23.0	14.1	12.1	9.6	25.3	
23	19.0	22.0	11.8	14.3	12.4	29.3	
24	14.0	20.2	11.4	8.8	10.1	42.6	
25	14.0	20.9	13.6	21.9	9.2	40.3	
26	15.9	19.9	17.0	13.1	8.3	45.0	
27	18.0	20.3	15.4	9.1	10.3	31.2	
28	18.3	24.4	21.5	9.2	5.9	0.0	
29	21.3	15.1	17.7	10.7	5.7	21.1	
30	20.7	14.0	19.8	9.9	8.0	21.1	
31	20	12	18.3	11	13.1	21	

Compliance Summary: The cement plant is compliant with the Licence limits

Note: “0” emissions means that the kiln is not operating.

1.2 Annual Stack Monitoring

2018-19: Date of stack testing: 18/07 to 23/07/2018; Report received: 29/08/2018;
Date published: 08/09/2018

Assessable Parameter (milligrams per cubic metre)	Licence Limit	2018-19
Emission Source: Cement Mill No 6 Stack (EPA Identification No. 4)		
Solid Particles 'Duct A'	100	1.9
Solid Particles 'Duct B'	100	7.1
Emission Source: Kiln No 6 Cooler Stack (EPA Identification No. 5)		
Solid Particles	100	<2
Emission Source: Cement Mill No 7 Stack (EPA Identification No. 10)		
Solid Particles	20	16

Emission Source: Kiln No 6 Stack (EPA Identification No. 2)

Parameter	Unit	Limits	Jul-18	Aug-18	Aug-18	Sep-18	Sep-18	Oct-18
Mercury	mg/m3	0.05	0.011	0.0041	0.0085	0.0064	0.0096	0.012
Type 1 and type 2 substances	mg/m3	0.5	0.04	0.024	0.027	0.39	0.032	0.03
Solid particles	mg/m3	50	21	38	21	670	13	16
Nitrogen oxides	mg/m3	1250	1200	940	900	830	930	620
Cadmium and Thallium	mg/m3	0.05	0.015	0.0018	0.0012	0.21	0.0017	0.0016
Clorine	mg/m3	50	0.009	0.014	0.09	0.009	0.017	0.01
Dioxind and Furans (I-TEQ middle bou	ng/m3	0.1	0.00055	0.00044	0.0003	0.032	0.015	0.006
Hydrogen chloride	mg/m3	10	0.02	0.035	0.056	1.1	6.6	1.1
Hydrogen fluoride	mg/m3	1	0.02	0.027	0.02	0.03	0.02	0.056
Sulfur dioxide	mg/m3	50	0.02	0.02	0.033	0.08	0.01	0.01
Sulfuric acid mist and sulfur trioxide	mg/m3	50	0.02	0.035	0.04	0.07	1.7	0.64
Volatiles organic compounds	mg/m3	40	0.2	3.3	3.8	7	3.7	1.7

Compliance summary: The cement plant is compliant with the Licence limits.

2. Ambient air/dust monitoring

2.1 Dust Deposition Gauges: Total Insoluble Matter (grams per square metre per month)

This test measures the levels of the coarse dust (generated mostly from unsealed roads, raw material handling, open stockpiles, etc.). It is a measure of dust *nuisance* (dust on cars, washing, window panes) in the immediate vicinity of the source, as the heavy dust settles quickly and doesn't travel far. It is not an indication of potential health problems as it doesn't penetrate into the respiratory system due to a large size of dust particles.

Licence limit: Not specified.

The NSW State guideline of 4 g/m^2/month (presented as 12-month rolling average) was adopted.

Note: Dust Gauges 4 and 6 were removed, and Dust Gauges 5 and 7 relocated closer to the boundary in December 2012.

	Dust Deposition Gauges (grams per square metre per month as 12-month rolling average)						
	1	2	3	5	7	8	9
January 2017 Report received: 18/01/17 Date published: 08/02/17	0.7	0.3	2.4	1.0	0.7	1.1	1.3
February 2017 Report received: 20/02/17 Date published: 08/03/17	0.6	0.4	2.3	1.0	0.8	1.0	1.2
March 2017 Report received: 20/03/17 Date published: 08/04/17	0.7	0.5	2.5	1.1	0.8	0.8	1.4
April 2017 Report received: 20/04/17 Date published: 08/05/17	0.6	0.5	2.5	1.0	0.7	0.8	1.3
May 2017 Report received: 01/06/17 Date published: 08/06/17	0.5	0.5	2.5	1.0	0.6	0.8	1.3
June 2017 Report received: 19/06/17 Date published: 08/07/17	0.6	0.5	2.3	0.9	0.6	1.2	1.4
July 2017 Report received: 14/07/17 Date published: 08/08/17	0.6	0.6	2.3	0.9	0.6	1.2	1.4
August 2017 Report received: 23/08/17 Date published: 08/09/17	0.6	0.6	2.2	0.9	0.6	1.1	1.4
September 2017 Report received: 20/09/17 Date published: 08/10/17	0.6	0.6	2.1	0.9	0.6	1.1	1.4
October 2017 Report received: 16/10/17 Date published: 08/11/17	0.6	0.6	2.3	0.9	0.6	1.1	1.3
November 2017 Report received: 16/11/17 Date published: 08/12/17	0.6	0.7	2.3	1.1	0.6	1.7	1.6
December 2017 Report received: 18/12/17 Date published: 08/01/18	0.7	0.7	2.3	1.2	0.7	1.5	1.5
January 2018	0.7	0.7	2.4	1.3	0.7	1.7	1.5

Report received: 18/01/18 Date published: 08/02/18							
February 2018 Report received: 16/02/18 Date published: 08/03/18	0.7	0.7	2.5	1.3	0.6	1.7	1.6
March 2018 Report received: 16/03/18 Date published: 08/04/18	0.7	0.7	2.4	1.3	0.5	1.7	1.3
April 2018 Report received: 18/04/18 Date published: 08/05/18	0.7	0.7	2.4	1.2	0.5	1.7	1.4
May 2018 Report received: 15/05/18 Date published: 08/06/18	0.7	0.8	2.5	1.2	0.5	1.7	1.5
June 2018 Report received: 15/06/18 Date published: 08/07/18	0.7	0.7	2.4	1.4	0.4	1.3	1.5
July 2018 Report received: 17/07/18 Date published: 08/08/18	0.7	0.6	2.5	1.4	0.4	1.3	1.5
August 2018 Report received: 20/08/18 Date published: 08/09/18	0.7	0.6	2.8	1.3	0.4	1.3	1.5
September 2018 Report received: 10/09/18 Date published: 08/10/18	0.7	0.6	3.2	1.5	0.4	1.3	1.6
October 2018 Report received: 23/10/18 Date published: 08/11/18	0.7	0.7	3.1	1.6	0.6	1.3	1.7
November 2018 Report received: 21/11/18 Date published: 08/12/18	0.7	0.6	3.2	1.5	0.4	0.8	1.6
November 2018 Report received: 20/12/18 Date published: 08/01/19	0.8	0.6	3.3	1.6	0.4	0.8	1.7

Compliance Summary: The cement plant is compliant with the adopted State guideline value.

2.2 High Volume Air Sampling: Total Suspended Particulates (TSP) and PM_{10}

This test measures the levels of the fine dust suspended in the air (generated mostly from stack emissions). It is a measure of potential *health effects* (irritation of the respiratory track) as the small particles can penetrate into the airways and the lungs. Fine dust can persist in the atmosphere for days or even months before it settles and can travel some distance.

Licence limits: Not specified.

The following guideline values were adopted:

- TSP: 90 micrograms per cubic metre (annual rolling average) - NSW State guideline

- PM_{10}: 60 micrograms per cubic metre (daily average) with 7 exceedances allowed per annum - Southern Highlands regional guideline

Sampling Date	Report received	Date published	Parameter (micrograms per cubic metre)	
			TSP (annual rolling average)	PM_{10} (24-hr average)
1/12/16	20/01/17	08/02/17	52.2	39.2
7/12/16			52.2	12.4
13/12/16			53.0	45.3
19/12/16			52.7	13.1
25/12/16			52.8	10.2
31/12/16			53.3	16.0
06/01/17	10/02/17	08/03/17	53.1	1.6
12/01/17			52.5	10.3
18/01/17			54.4	60.2
24/01/17			56.0	47.7
30/01/17			57.7	46.9
05/02/17	17/03/17	08/04/17	59.6	53.3
11/02/17			61.2	54.3
17/02/17			61.7	25.8
23/02/17			62.0	28.1
1/03/17	26/04/17	08/05/17	61.9	8.2
7/03/17			62.0	8.0
13/03/17			61.9	19.9
19/03/17			62.1	4.3
25/03/17			60.9	8.9
31/03/17			60.3	4.5
06/04/17	18/05/17	08/06/17	60.0	7.9
12/04/17			59.5	2.0
18/04/17			59.5	9.4
24/04/17			59.8	9.8
30/04/17			59.2	5.8
6/5/17	19/6/17	08/07/17	58.7	51.8
12/5/17			57.5	17.6
18/5/17			55.0	4.5
24/5/17			53.7	22.2
30/5/17			53.5	23.8
5/06/17	28/7/17	08/08/17	54.2	11.8
11/06/17			53.0	1.6
17/06/17			52.6	1.5
23/06/17			50.7	55.2
29/06/17			50.6	10.3
05/07/17	15/8/17	08/09/17	52.7	49.8
11/07/17			53.6	21
17/07/17			52.8	6.4
23/07/17			55.2	45.5
29/07/17			53.5	9.2
04/08/17	11/9/17	08/10/17	55.8	36.5
10/08/17			56.9	18.7
16/08/17			59.4	44.6
22/08/17			58.4	20.2
28/08/17			57.3	3.8
03/09/17	16/10/17	08/11/17	58.4	33.2
09/09/17			59.5	9.8

15/09/17			63.2	58.3
21/09/17			63.6	21.4
27/09/17			63.9	19.1
03/10/17			64.4	25
09/10/17			65.4	28
15/10/17	14/11/17	08/12/17	65.2	9
21/10/17			65.1	11
27/10/17			63.9	4.2
02/11/17			63.6	8.9
08/11/17			62.5	6.3
14/11/17	11/12/17	08/01/18	61.0	5
20/11/17			60.5	4.9
26/11/17			55.9	6
02/12/17			59.1	18.2
08/12/17			59.8	19.6
14/12/17	17/01/18	08/02/18	60.3	49.8
20/12/17			63.1	79.2
26/12/17			63.1	9.1
01/01/18			62.9	12.7
07/01/18			65.1	58.8
13/01/18	16/02/18	08/03/18	66.3	23
19/01/18			68.6	70.9
25/01/18			68.6	19.6
31/01/18			66.5	10.4
06/02/18			64.6	5.1
18/02/18	27/03/18	08/04/18	63.1	31.9
24/02/18			62.6	5.1
02/03/18			62.3	12.5
08/03/18			62.4	6.5
14/03/18	24/04/18	08/05/18	62.6	9.1
20/03/18			62.9	18.8
26/03/18			63.4	14.1
01/04/18			64.4	29.8
07/04/18			65.1	23.3
13/04/18	10/05/18	08/06/17	68.0	62.4
19/04/18			68.5	24.6
25/04/18			69.1	31.4
01/05/18			69.0	6.6
07/05/18			70.0	20.4
13/05/18	15/06/18	08/07/18	70.4	4.2
19/05/18			70.2	5.5
25/05/18			70.2	7.3
31/05/18			68.9	16.4
18/06/18			67.6	3.2
24/06/18	24/07/18	08/08/18	67.2	8.4
30/06/18			67.3	4.0
06/07/18			68.9	40.8
12/07/18			69.2	8.1
18/07/18	13/08/18	08/09/18	69.7	34.7
24/07/18			68.6	34.6
30/07/18			67.9	7.3

05/08/18	13/09/18	08/10/18	68.0	8
11/08/18			66.9	45.8
17/08/18			66.8	7.9
23/08/18			65.2	15.3
29/08/18			64.0	7.5
04/10/18	24/10/18	08/11/18	60.9	2.2
10/10/18			60.3	6.4
16/10/18			60.4	7.4
22/10/18			60.0	17.2
28/10/18			60.5	40.6
4/10/18	15/11/18	08/12/18	56.6	3.7
10/10/18			55.8	5.0
22/10/18			54.9	11.8
28/10/18			53.7	9.2
3/11/18	20/12/18	08/01/19	53.5	30.1
9/11/18			53.4	11.5
15/11/18			53.4	7.2
27/11/18			53.5	13.6

Compliance Summary: The plant is compliant with the adopted guideline values. Council started excavation for new bridge over the railway line in December 2017. The construction site is located just few meters away from the HVAS hence impacting the reading from December and January. HVAS was relocated on 18th February 2018.

3. Water monitoring

Runoff water from the cement works and surrounding agricultural land is captured in various storage dams on site and used as process water. In heavy rain, excess stormwater from the dam called "Lake Quality" is allowed to overflow into the Wingecarribee River. The quality of that water is required by the licence to be monitored once per overflow event. The licence specifies the parameters to be monitored, but does not specify any limits for these parameters.

Licence limits: Not specified.
The NSW State guidelines: Typical discharge limits are as follows:
Biological Oxygen Demand: 20 milligrams per litre
pH: 6.5-8.5
Oil and Grease: 10 milligrams per litre
Total Suspended Solids: 30-50 milligrams per litre

Sampling Date	Report received	Date published	Biological Oxygen Demand (milligrams per litre)	pH	Oil and Grease (milligrams per litre)	Total Suspended Solids (milligrams per litre)
04/02/16	11/02/16	08/03/16	<2	8.4	<5	38
06/06/16	14/06/16	08/07/16	<2	9.8	<5	85

07/07/16	17/07/16	08/08/16	<2	8.5	<5	32
26/08/16	02/09/16	08/09/16	<2	8.5	<5	14
05/09/16	13/09/16	08/10/16	2	8.9	<5	33
12/09/16	19/09/16	08/10/16	<2	8.5	<5	11
24/10/16	31/10/16	08/11/16	3	7.3	<5	7
07/02/17	16/02/17	08/03/17	3	8.7	<5	50
17/03/17	24/03/17	08/04/17	<2	8.5	<5	34
27/02/18	06/03/18	08/03/18	<2	8.6	<5	26
15/12/18	31/12/18	08/01/19	<2	8.8	<5	24

Compliance summary: Lake Quality's overflow generally meets the typical NSW discharge criteria. Occasionally, an exceedance of pH may occur in the overflow due to alkaline nature of raw materials and products handled on site.

4. Noise monitoring

The Annual Noise Monitoring Reports by Hatch Consultants are being uploaded to the Berrima webpage in their entirety. In the Summary and Conclusions of each Annual Report, Hatch confirms that Berrima Cement Works "is in compliance with its licence conditions for noise".

REPORT ENDS